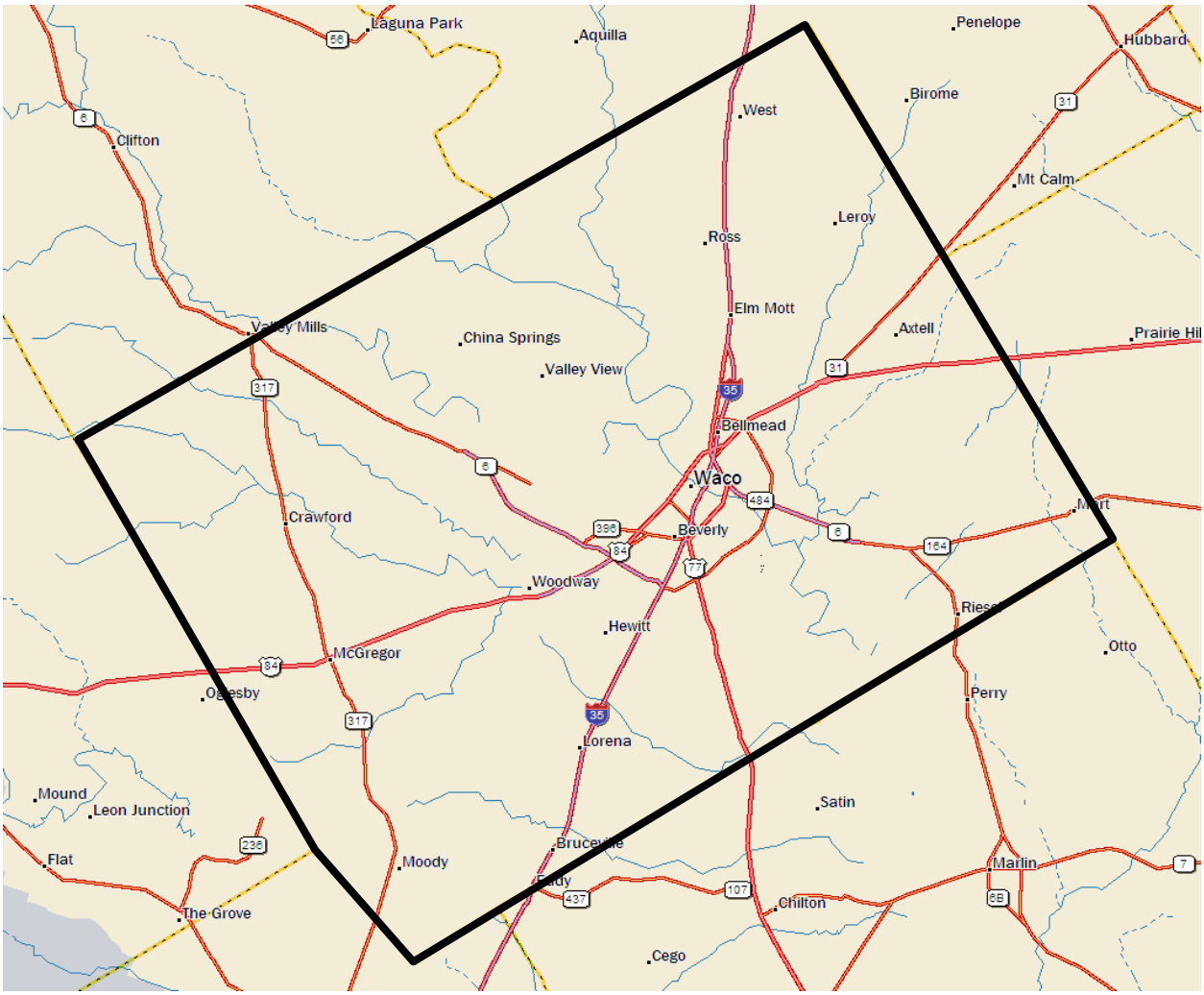
Southern Trinity Groundwater Conservation District

Groundwater Management Plan

Approved by District Board of Directors on July 15, 2021



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1. Introduction

This plan will become effective upon adoption by the District's Board of Directors and approval by the Texas Water Development Board. The plan will remain in effect for five (5) years after the date of approval unless amended or replaced sooner.

1.1. Background and Purpose

The District was created by legislation in the 80th Texas Legislature in 2007 (SB1985), and amended by the 81st Texas Legislature in 2009 (SB2513) and by the 82nd Texas Legislature in 2011 (HB801). The purpose of the District is to conserve, preserve, protect, recharge and prevent the waste of groundwater and to control subsidence caused by groundwater withdrawals, consistent with Section 59, Article XVI, Texas Constitution and Chapter 36, Texas Water Code.

1.2. Groundwater Resources

The District has within its boundaries the Trinity, the Woodbine, and the Brazos River Alluvium aquifers. The following paragraphs describe the aquifers and their approximate locations within the District. The relationship to confining units and other groundwater resources within the District are also discussed. Appendix 10.1 contains a chart of showing the geological cross-section passing through the District from Northwest to Southwest. This cross-section shows the out crop and recharge area of the Trinity Aquifer.

1.2.1. Trinity Aquifer

The Trinity Aquifer is located throughout McLennan County as a confined aquifer. Its recharge area occurs outside the District to the north and west. There are a number of named, geologic formations that, collectively, are considered to comprise the Trinity Aquifer. To the west of McLennan County, the aquifer is designated the Twin Mountains formation where the sands crop out on the surface and receive recharge from precipitation. To the north where the Glen Rose formation is absent, the Trinity Aquifer is called the Antlers formation and to the south it is designated the Travis Peak. The portion of the Trinity Aquifer within the District has three water bearing strata: the Paluxy, the Hensell and the Hosston. The aquifer dips to the southeast becoming deeper below the surface in the eastern part of the District. The increase in depth to the southeast is accentuated by the Balcones Fault Zone, which consists primarily of normal faults downthrown to the southeast. As the aquifer dips to the southeast the Hensell and Hosston become divided by several formations including the Pearsall, Cow Creek, Hammett and Sligo.

The Paluxy, Glen Rose, Pearsall, Cow Creek, Hammett and Sligo formations are not major contributors to aquifer production but they are included with the Hensell and Hosston formations as the Trinity Aquifer in the District. The Paluxy formation only occurs in the western part of the District. The outcrop of the Paluxy occurs outside of the District boundaries to the north and

west. There is very little or no use of groundwater in the portion of Paluxy within McLennan County.

1.2.2.1 Management Zones

Figure 1.1 below shows the geographic location of the Hensell Management Zone (Hensell MZ) and Figure 1.2 shows the geographic location of the Hosston Management Zone (Hosston MZ). Permitted groundwater wells located in the Hensell MZ predominately withdraw groundwater from the Hensell (upper) stratum of the Trinity Aquifer and wells located in the Hosston MZ predominately withdraw groundwater from the Hosston (lower) stratum of the Trinity Aquifer. Some wells in both management zones may withdraw water from both the upper and lower strata.

The District groundwater level monitoring program has shown that the annual rate of decline for wells located in the Hensell MZ is greater than that in the Hosston MZ and that management of each of the aquifers may require different limitations on the amount of annual production allowed from each respective stratum.

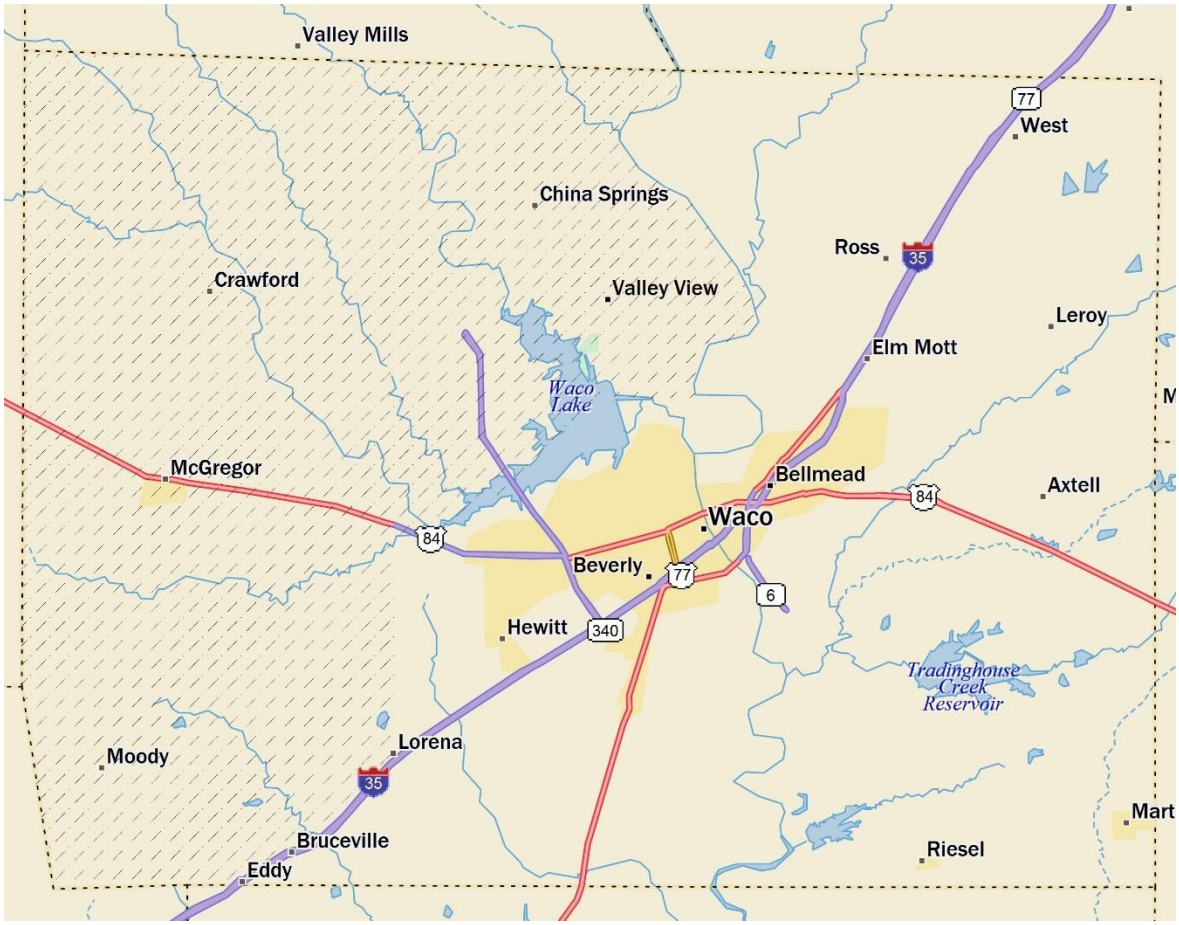

Figure 1.1 Geographic Extent of Hensell Management Zone (shown as hatched area)

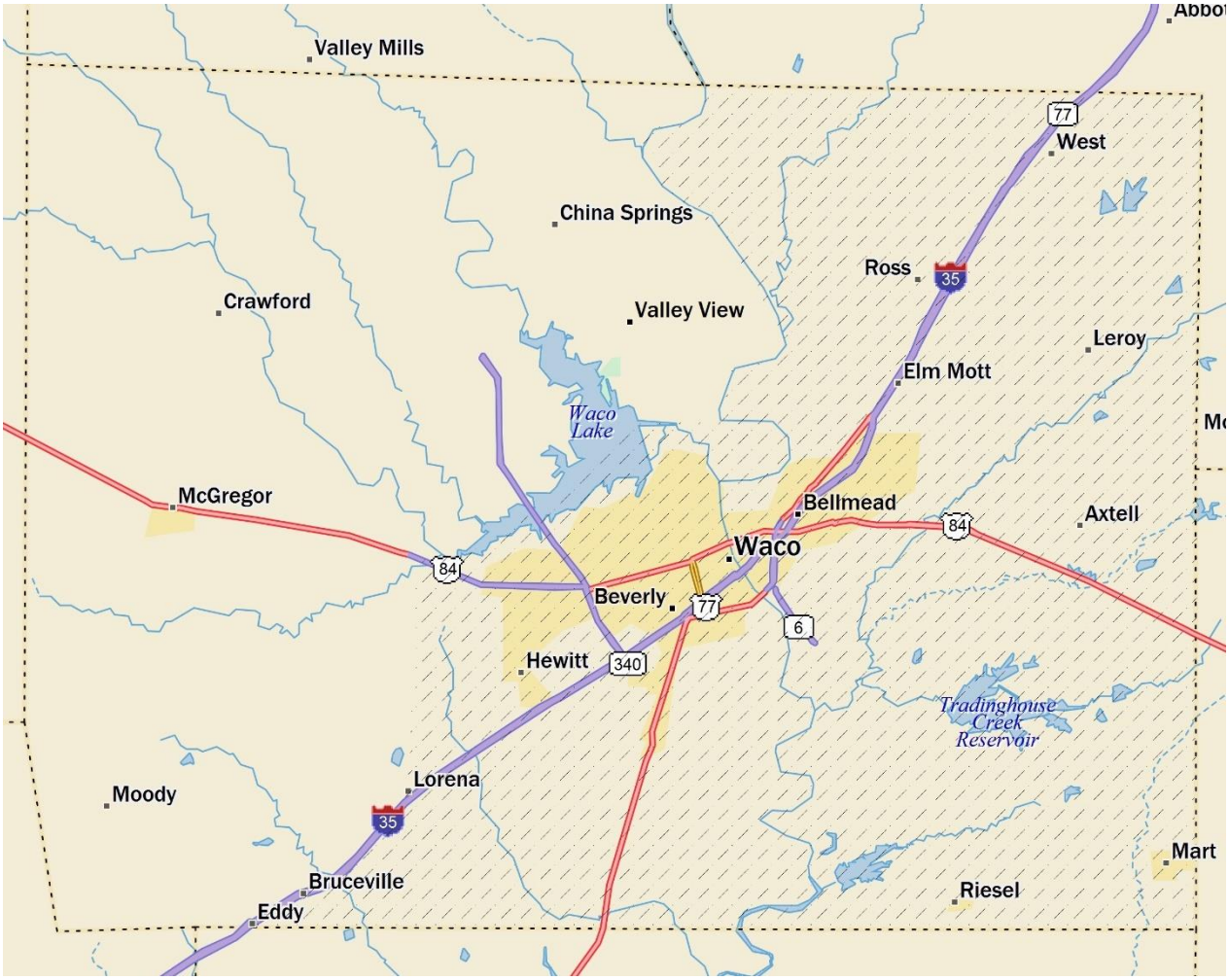

Figure 1.2 Geographic Extent of Hosston Management Zone (shown as hatched area)

1.2.2. Brazos River Alluvium Aquifer

The Brazos River Alluvium Aquifer consists of water bearing alluvial sediments that occur in floodplain and terrace deposits proximate to the Brazos River as it flows through McLennan County. The Brazos River Alluvium Aquifer is an unconfined aquifer that receives recharge primarily from direct precipitation on the floodplain surface but may also be recharged from overbank flows during flood events and from lateral flow from adjacent formations. The aquifer discharges through springs and seeps into the Brazos River and streams within the outcrop of the alluvium.

1.2.3. Woodbine Aquifer

The Woodbine Aquifer is a minor aquifer that extends only into a very limited portion of the northernmost part of McLennan County. The outcrop of the Woodbine occurs within the District boundaries but is covered by alluvium over much of its area. There is no or very little use of the groundwater in the portion of the Woodbine Aquifer within McLennan County. McLennan

County has a desired future condition for the Woodbine Aquifer of 6 feet of decline and a MAG of 0 acre-feet per decade.

1.2.4. Other Groundwater Resources

Shallow or perched groundwater occurs in the fractured weathered veneer of the Fredericksburg and Washita series and in other formations in McLennan County. Little water is produced from this shallow or perched groundwater in McLennan County but it supports small springs and local stream base flow.

1.3. Texas Water Development Board - Groundwater Availability Models (GAMs)

The Trinity and Woodbine aquifers are included in a Texas Water Development Board (TWDB) groundwater availability model run (GAM Run 19-016) for the northern portions of the Trinity Aquifer and Woodbine Aquifer, and the Brazos River Alluvium Aquifer. These models were used as a reference for estimating recharge from precipitation, the amount of flow into and out of the district, and the amount of inflow from overlying or underlying units. The following versions of the groundwater availability models were used GAM Run 19-016:

1) Version 2.01 model for the northern portion of the Trinity Aquifer and Woodbine Aquifer (Kelley, V.A., Ewing, J., Jones, T.L., Young, S.C., Deeds, N., and Hamlin, S., 2014); and
2) Version 1.01 of the groundwater availability model for the Brazos River Alluvium Aquifer released on December 16, 2016 (Ewing and Jigmond, 2016).

1.4. Priority Groundwater Management Area

The Texas Commission on Environmental Quality (TCEQ) designated portions of the Trinity Aquifer, including that portion within the District, as a Priority Groundwater Management Area (Appendix 10.3). This TCEQ finding indicates that the decline in groundwater levels in the Central Trinity Aquifer is a significant problem and that the decline in groundwater levels will cause groundwater availability and quality problems for the region.

2. Groundwater Management

The District has adopted rules to regulate groundwater withdrawals, primarily by means of well spacing and production limits (Appendix 10.12). The District will make periodic assessments of groundwater conditions within the District and will report those conditions to the Board. The District will undertake investigations and, to the extent appropriate, cooperate with third-party investigations, of the groundwater resources within the District, and the results of the investigations will be made available to the public.

The District has adopted rules designed to achieve the desired future conditions (DFCs) for the groundwater resources within the District, as those DFCs are agreed upon by Groundwater

Management Area 8 (GMA 8). GMA 8 has classified the Brazos River Alluvium Aquifer as non-relevant for the purposes of joint planning and has not adopted any DFCs for that aquifer. The District has designated the Woodbine Aquifer non-relevant for its planning purposes within the District. Nevertheless, due to the significant amounts of groundwater available from the Brazos Alluvium Aquifer and the Trinity Aquifer in the District, the District adopted an historic use period and provided preferential permitting rights to those well owners that can demonstrate beneficial and non-wasteful groundwater usage from the Trinity and Brazos Alluvium aquifers during that period. The District also authorizes groundwater permits to be issued that are not based on withdrawals during the historic use period. Similar approaches might be adopted for other groundwater sources within the District as well. The District may, after notice and hearing, amend or revoke any permit for non-compliance, or reduce the production authorized by permit for the purpose of protecting the aquifer and groundwater availability. The District will enforce the terms and conditions of permits and the rules of the District as authorized by Chapter 36 of the Texas Water Code.

The District will employ reasonable technical resources within its budgetary constraints to evaluate the groundwater resources within the District and to determine the effectiveness of regulatory or conservation measures.

The District will establish and enforce rules that require, among other things, the following:

1. spacing requirements for certain groundwater wells;
2. permits limiting the annual amount of groundwater that can be produced from non-exempt wells;
3. a limit on the maximum amount of groundwater permitted for withdrawal from the Hensell (upper) stratum of the Trinity Aquifer within the District;
4. a limit on the maximum amount of groundwater permitted for withdrawal from the Hosston (lower) stratum of the Trinity Aquifer within the District; and
5. a limit on the maximum amount of groundwater permitted for withdrawal from the Brazos River Alluvium Aquifer within the District.

3. Estimates of Annual Volumes of Water

The estimates of annual volumes of water discussed in this section were obtained from a report prepared by the TWDB (GAM Run 19-016 report). A copy of this report is included in Appendix 10.2. This report contains estimates of the annual amount of recharge from precipitation, annual volumes of water that discharge from aquifers to springs, annual volumes of groundwater inflow and outflow to and from aquifers and volume of flow between aquifers. All values reflect estimated groundwater flow with respect to the District's boundaries. Appendix 10.4 contains a copy of a Technical Memorandum regarding "The Brazos River Alluvium Aquifer Flow System in McLennan County, Texas". The estimates of annual volumes of water

for the Brazos River Alluvium Aquifer cited in this plan were obtained from the GAM Run 19-016 report.

3.1. Estimate of the Annual Volume of Water That Discharges from the Aquifers to Springs and any Surface Water Bodies, Including Lakes, Streams and Rivers

3.1.1. Trinity Aquifer (Paluxy, Glen Rose, Hensell, Pearsall/Cow Creek/Hammett, Sligo, and Hosston strata)

The estimate for discharges from the Trinity Aquifer to springs or surface water bodies is 0 acre-feet per year (Table 1 in Appendix 10.2).

3.1.2. Brazos River Alluvium Aquifer

The estimate of discharge from the Brazos River Alluvium Aquifer to the Brazos River to springs or surface water bodies is 13,177 acre-feet per year in McLennan County (see Table 3 in Appendix 10.2).

3.1.3. Woodbine Aquifer

The estimate of the total annual volume of water that discharges from the Woodbine Aquifer to springs or surface water bodies is 1,334 acre-feet. No discussion was provided in the report regarding the location of the discharge but it is likely much of the discharge is to seeps along the sides and beds of streams (Table 2 in Appendix 10.2).

3.1.4. All other Aquifers, Formations, or Series

The estimate of the total annual volume of water that discharges from all other aquifers, formations, or series is 0 acre-feet per year.

3.2. Estimate of the Modeled Available Groundwater in the District Based On The Desired Future Condition of the Aquifers

3.2.1. Trinity Aquifer (Hensell, Pearsall/Cow Creek/Hammett, Sligo, and Hosston Formations)

Modeled Available Groundwater for the portion of the Trinity Aquifer (Hensel and Hosston formations) within the District has been determined by the Texas Water Development Board for the year 2020 to be 20,691 acre-feet per year (Appendix 10.5).

3.2.2. Brazos River Alluvium Aquifer

In 2017, Groundwater Management Area 8 (GMA8) approved a resolution that stated that the portions of the Brazos River Alluvium, Blossom, and Nacatoch aquifers within the GMA8 planning area are “non-relevant for planning purposes” based on GMA8’s February 10, 2017

"Desired Future Conditions Explanatory Report." which on page 66-72 states in part that "a non-relevant designation for these aquifers will not affect the desired future conditions for other aquifers in the GMA, the districts in GMA 8 have determined that these aquifers are non-relevant for joint planning."

Nevertheless, the Brazos River Alluvium Aquifer within the District is an important renewable aquifer and has a significant amount of permitted and exempt groundwater use that, if unavailable, would place an additional burden on, and increase the rate of decline of, the Trinity aquifer. The District manages and permits all non-exempt pumping within the District's portion of the aquifer.

While there is currently no desired future condition for the Brazos River Alluvium Aquifer, the District still uses the modeled available groundwater estimates as reported in Table 5 in GTA Aquifer Assessment 10-18 MAG (Appendix 10.6) for permitting considerations.

3.2.3. Woodbine Aquifer

Modeled Available Groundwater for the portion of the Woodbine Aquifer within the District has been determined by the Texas Water Development Board to be 0 acre-feet per year (Appendix 10.5)

3.3. Estimate of the Amount of Groundwater Being Used within the District on an Annual Basis

Comprehensive groundwater production and consumption data for McLennan County have been accumulated and reported by and to the District since February 2008. The District has worked each year since 2008 to improve the accuracy and completeness of the metering reports and amount of annual groundwater produced in the District. Appendix 10.8 contains records for production for the years 2010 through 2019. Appendix 10.9 contains a report evaluating the amount of agricultural land that was irrigated in 2017 and 2018 in the District (both surface water and groundwater) and was used to verify the amount of groundwater production reported to the District for agricultural use. Appendix 10.11 contains a table of the Estimated Historical Water Use prepared by the TWDB showing groundwater use in McLennan County for 2016 as 15,118 acre-feet, for 2017 as 15,861 acre-feet, and for 2018 as 14,562 acre-feet.

3.3.1. Trinity Aquifer (Paluxy, Glen Rose, Hensell, Pearsall/Cow Creek/Hammett, Sligo, and Hosston Formations)

Exempt production from the Trinity Aquifer is estimated at 200 acre-feet per year. The total amount reported of groundwater pumpage from the wells screened in the Trinity is 13,070, 13,561, 12,706, 12,505, and 13,401 acre-feet per year for 2015 through 2019, respectively (Appendix 10.8, total of Trinity and Brazos River Alluvium pumping).

3.3.2. Brazos River Alluvium Aquifer

The amount of production groundwater production from the Brazos River Alluvium aquifers was 89, 89, 137, 237, 422 acre-feet per year for 2015 through 2019, respectively (Appendix 10.8).

3.3.3. Woodbine Aquifer

There are no known non-exempt wells located in the portion of the Woodbine Aquifer within the District. The exempt use, if any, is likely less than 5 acre-feet per year.

3.3.4. All Other Aquifers and Geological Formations or Series

There is no estimate of the amount of groundwater being used within the District on an annual basis for any other aquifers or geological formations or series.

3.4. Estimate of the Annual Amount of Recharge, from Precipitation, to the Groundwater Resources Within The District

3.4.1. Trinity Aquifer (Paluxy, Glen Rose, Hensell, Pearsall/Cow Creek/Hammett, Sligo, and Hosston Formations)

There is no known recharge from precipitation to the Trinity Aquifer (Paluxy Aquifer, Glen Rose Formation, Hensell Aquifer, Pearsall/Cow Creek/Hammett/Sligo Formations and Hosston Aquifer) within the District.

3.4.2. Brazos River Alluvium Aquifer

Recharge from precipitation to the Brazos River Alluvium Aquifer is estimated to be 7,363 acre-feet per year within the District (Appendix 10.2).

3.4.3. Woodbine Aquifer

The estimate of annual recharge from precipitation to the Woodbine Aquifer within the District is 355 acre-feet (Appendix 10.2).

3.4.4. All Other Aquifers, Formations, or Series

There are no recharge estimates available from precipitation to all other aquifers, formations, or series within the District.

3.5. Estimate of the Annual Volume of Flow Into and Out of the District Within each Aquifer, and Between Aquifers, in the District

3.5.1. Trinity Aquifer

The estimated annual volume of flow into the District for the Trinity Aquifer is 12,513 acre-feet. The estimated annual volume of flow out of the District for the Trinity Aquifer is 1,251 acre-feet.

The estimate of the annual volume of flow from overlying confining units into the Trinity Aquifer (Hensell formation) is 534 acre-feet (Appendix 10.2).

3.5.2. Brazos River Alluvium Aquifer

Estimated annual volume of flow into the District for the Brazos River Alluvium Aquifer is 21 acre-feet per year, the estimated net annual volume of vertical flow between the Brazos from underlying units is 27 acre-feet per year, and the estimated annual volume of flow out of the District for the Brazos River Alluvium Aquifer is 571 acre-feet per year (Appendix 10.2). The Brazos River Alluvium Aquifer is a water table aquifer and has no overlying aquifer. It is underlain in McLennan County by slowly permeable aquitards and therefore there is no measurable vertical inflow between the Brazos River Alluvium Aquifer and overlying or underlying units (Yelderman, 2008). The GAM Run 19-016 (Appendix 10.2) simulation estimates the vertical inflow to be 27 acre-feet per year, which for all practical purposes is the same as "no measurable vertical inflow" reported by Yelderman.

3.5.3. Woodbine Aquifer

The estimated annual volume of flow into the District for the Woodbine Aquifer is 224 acre-feet. The estimated annual volume of flow out of the District for the Woodbine Aquifer is 7 acre-feet. The estimate of the annual volume of flow from the Woodbine Aquifer into the underlying Fredericksburg and Washita groups is 50 acre-feet per year, the estimated amount annual flow into the Woodbine Aquifer from younger overlying units is 76 acre-feet, and annual flow from the Woodbine aquifer to the downdip Woodbine Formation is 1 acre-foot (Appendix 10.2).

3.6. Estimate of the Projected Surface Water Supply within the District According to the Most Recently Adopted 2017 State Water Plan

The projected surface water supply for McLennan County ranges from 63,229 acre-feet in 2020 to 53,408 acre-feet in 2070 (see Appendix 10.11).

3.7. Estimate of the Projected Total Demand for Water within the District According to the 2017 State Water Plan

The 2017 State Water Plan lists the water demands within the District as 72,092 acre-feet in 2020 and increasing to 98,392 acre-feet in 2070 (Appendix 10.11).

4. Performance Standards and Management Objectives to Effectuate the Plan

The District will prepare and present an annual report to the Board of Directors on the performance of the District in regards to achieving management goals and objectives. The Board

will maintain the adopted report on file, for public inspection, at the District's office. This methodology will apply to all management goals contained within this plan.

5. Actions, Procedures, Performance and Avoidance Necessary to Effectuate the Management Plan

The District's rules relating to permitting, well spacing, production limits, and transportation of groundwater outside of the District will be developed consistent with this plan and in consideration of the best technical data that are reasonably available regarding the groundwater resources within the District.

The District will seek cooperation with other agencies in the implementation of this plan and the management of groundwater supplies within the District. Activities of the District will be undertaken in cooperation and coordination with the appropriate state, regional or local water management entity.

5.1. Socioeconomic Impacts

The TWDB has prepared reports on the socioeconomic impacts of not meeting the water needs identified for each of the Regional Water Planning Groups for the 2016 Regional Water Plans as adopted in the 2017 State Water Plan. The District has evaluated the development of its DFCs in the context of the recommended water management strategies proposed in the 2016 Regional Water Plan.

5.2. Interests and Rights in Private Property

The District has considered the potential impact on private property, including the ownership and rights of landowners and their lessees and assigns in groundwater within the GMA as recognized under Texas Water Code Section 36.002.

5.3. Feasibility of Achieving the Desired Future Condition

The District monitors groundwater level conditions in aquifers within the District's boundaries, accurately obtains and measures the amount of groundwater production, and is currently meeting its "district averaged" desired future conditions

6. Evidence of Coordination and Adoption of Plan

6.1. Certified Copy of The District's Resolution Adopting The Plan

Appendix 10.13 contains a copy of the District resolution adopting this plan.

6.2. Evidence that the Plan was adopted after Notice and Hearing

Documentation demonstrating that the plan was adopted after appropriate public notice and hearing are located at Appendix 10.14 - Evidence of Notice and Hearing.

6.3. Coordination of Management Plan with Surface Water Management Entities

The District provided a draft copy of this Management Plan to the following surface water management entities within its boundaries: the City of Waco, the City of Crawford, the City of Mart, the City of Robinson, and the Brazos River Authority and invited comments from those entities. This Management Plan was adopted on July 15, 2021 by the District's Board of Directors after a public hearing and a copy of the final plan was emailed to the City of Waco, the City of Crawford, the City of Mart, the City of Robinson, and the Brazos River Authority (see Appendix 10.7).

6.4. Copy of District's Current Rules

A copy of the District's current, existing rules is included in Appendix 10.12 or can be downloaded at https://southerntrinitygcd.org/announcements/.

7. Consideration of State Water Plan Water Supply Needs and Water Management Strategies

7.1. Water Supply Needs

Appendix 10.11 contains a list of the Water Supply Needs adopted in the 2017 State Water Plan for McLennan County showing a supply need (deficit) of 6,569 acre-feet per year in 2020 and 13,830 acre-feet per year in 2070. The 2017 State Water Plan lists the specific water supply needs for irrigation, manufacturing, mining, and the cities of Crawford, Elm Creek, Hewitt, Mart, Riesel, Robinson, Waco, and Woodway, and for other water supply entities such as Tri-County SUD, and North Bosque WSC, West Brazos WSC, and the City of Woodway. The District has reviewed and considered all water supply needs and information contained in the 2017 State Water Plan for McLennan County in the development of this plan.

7.2. Water Management Strategies

Appendix 10.11 contains a list of the Water Management Strategies adopted in the 2017 State Water Plan for the Region G Regional Water Planning Area and lists water management strategies including demand reduction, direct reuse, Trinity Aquifer storage and recovery (ASR), development of Carrizo-Wilcox Aquifer groundwater from Falls and Limestone counties, increased Brazos River Alluvium Aquifer groundwater within McLennan County, and increased surface water use. All of these strategies were reviewed and considered in the development of this plan.

8. Management Goals

For each of the following management goals, except to the extent that a goal is not applicable or not cost-effective, the District has identified specific objectives and listed performance standards to assess the progress of those objectives. The Board will evaluate the District's progress for attaining its management goals by periodically reviewing the performance standards and possibly modifying the management plan.

8.1. Providing the Most Efficient Use of Groundwater

In order to meet this goal, the District has established the following Management Objectives:

1. The District will continue its District Aquifer Water Level Observation Well Program with one or more observation well(s) located within the portions of the Trinity and Brazos River Alluvium aquifers within the District, and measure the depth to groundwater in each well or wells at least once annually.
2. The District will provide educational leadership to citizens within the District concerning the efficient use of groundwater. The activity will be accomplished annually through at least one printed publication, such as a brochure, and one public presentation at service organizations and/or public schools.

In order to assess the progress of the objectives listed above, the District has designated the following Performance Standards:

1. The District with continue its aquifer water level measurement program.
2. Water levels at observation wells will be measured a minimum of once annually.
3. The number of publications and speaking appearances by the District each year will be included in an annual report to the Board.

8.2. Controlling and Preventing Waste of Groundwater

In order to meet this goal, the District has established the following Management Objectives:

1. The District will provide educational leadership to citizens within the District identifying ways to minimize and avoid the waste of groundwater. This will be accomplished annually through at least one printed or on-line publication, such as a brochure, and one public presentation at service organizations and/or public schools.
2. The District will continue its Well Closure Program. The objective of the well closure program is to obtain the closure and plugging of derelict and abandoned wells in a manner that is consistent with state law, for the protection of the aquifers, the environment, and public safety. The District will conduct a program to identify, inspect, categorize and cause abandoned and derelict or deteriorated wells to be closed and plugged.

In order to assess the progress of the objective listed above, the District has designated the following Performance Standard:

1. The number of publications and speaking appearances by the District each year will be included in the annual report to the Board.
2. When applicable, the annual funding for the District's Well Closure Program, and the number of wells closed and plugged as a result of the Well Closure Program will be included in the annual report to the Board.

8.3. Controlling and Preventing Subsidence

This management goal is not applicable to the District. Because subsidence is not likely to affect the District, the District has not established any Management Objectives or Performance Standards for this conservation goal. Subsidence is unlikely to occur in the District. The geologic formations in the District range in age from Cretaceous (sandstones, limestones and shales of the Hosston, Hensell, Paluxy and Woodbine formations) to Quaternary (floodplain deposits of the Brazos River Alluvium). The Cretaceous formations are generally consolidated to semi-consolidated, and have little potential for compaction and subsidence due to groundwater withdrawals. The Brazos River Alluvium is poorly consolidated, but generally too thin to experience measurable (if any) subsidence due to groundwater withdrawals.

The District has reviewed the TWDB subsidence risk report "*Identification of the Vulnerability of the Major and Minor Aquifers of Texas to Subsidence with Regard to Groundwater Pumping*" (http://www.twdb.texas.gov/groundwater/models/research/subsidence/subsidence.asp). This report found four locations with Texas with observed subsidence and none of these areas are were within STGCD. Figure 4.49 on page 4.79 shows the Trinity Aquifer to have a subsidence risk ranging from low-medium to high-medium, and Figure 4.68 on page 4.110 shows the Brazos River Alluvium Aquifer to have a subsidence risk ranging from medium to high-medium. Both the Trinity and the Brazos Alluvium aquifer underly vast areas of Texas with significant differences in subsidence potential. For the reasons discussed the risk of any subsidence caused by groundwater pumping of the Trinity and Brazos Alluvium aquifers within the District's boundaries is very low. If any subsidence should be reported to the District the District will investigate, and if warranted, update its management plan to include a management objective to address such subsidence.

8.4. Addressing Conjunctive Surface Water Management Issues

In order to meet this goal, the District has established the following Management Objective:

Each year the District will participate in one or more meetings of the McLennan County Water Resources Group except for years when the group does not meet. The McLennan

County Water Resources Group is administrated by McLennan County (https://www.co.mclennan.tx.us).

In order to assess the progress of the objective listed above, the District has designated the following Performance Standard:

The number of meetings and other information regarding the McLennan County Water Resource Group will be included in the annual report to the Board.

8.5. Addressing Natural Resource Issues that Impact the Use and Availability of Groundwater and which are Impacted by the Use of Groundwater

In order to meet this goal, the District has established the following Management Objectives:

1. At least once per year, the District will contact a representative of the Texas Railroad Commission (RRC) to confer on the impact of oil and gas production on groundwater availability and quality, as well as the impact of groundwater production on the production of oil and gas in the District.
2. Also, during each year the District will evaluate permit applications for new wells, if any are filed, and the information submitted by the applicants on those wells prior to drilling, in order to assess the impact of these wells on the groundwater resources in the District.
3. The District reviewed the Texas and Wildlife endangered species list for McLennan County (https://tpwd.texas.gov/gis/rtest/) and found no species that would be affected by the District's groundwater management plan or rules.

In order to assess the progress of the objectives listed above, the District has designated the following Performance Standards:

1. The number of conferences with a representative of the RRC each year will be included in an annual report to the Board.
2. Annual reports to the District's Board of Directors on the number of new well permit applications on file, the number of evaluations and the possible impacts of those new wells on the groundwater resources in the District.

8.6. Addressing Drought Conditions

In order to meet this goal, the District has established the following Management Objective:

The District will track rainfall records from nearby weather stations on an ongoing basis. This data will be compared to hydrographs in monitoring wells used by the District. Additionally, the District will monitor the drought reports provided at the following internet sites:

https://www.waterdatafortexas.org/drought.

https://www.drought.gov/drought/data-maps-tools/current-conditions

The District staff will provide in its annual report in January the precipitation amounts, water levels and any apparent associated trends. Upon Board approval, the District's web site and/or local newspapers will disseminate information to the public.

In order to assess the progress of the objective listed above, the District has designated the following Performance Standard:

Report on precipitation amounts as compared to water levels within the District; and, manner and timing of distribution of precipitation and water level data to the public.

8.7. Addressing Conservation, Recharge Enhancement, Rainwater Harvesting, Precipitation Enhancement, or Brush Control, where Appropriate and Cost Effective

In order to meet this goal, the District has established the following Management Objective:

The District will provide educational leadership to citizens within the District concerning groundwater conservation, rainwater harvesting, and brush control. The educational efforts will be through at least one printed publication, such as a brochure, and at least one public speaking program at a service organization and/or public school. Each of the following topics will be addressed:

A. Conservation of groundwater

The District will provide educational leadership to citizens within the District concerning groundwater conservation. The educational efforts will be through at least one printed publication, such as a brochure, annually and at least one public speaking program at a service organization and/or public school annually.

B. Rainwater Harvesting

The District will provide educational leadership to citizens within the District concerning, rainwater harvesting. The educational efforts will be through at least one printed publication, such as a brochure, annually and at least one public speaking program at a service organization and/or public school annually.

C. Brush Control

The District will provide educational leadership to citizens within the District concerning brush control. The educational efforts will be through at least one printed publication, such as a brochure, annually and at least one public speaking program at a service organization and/or public school annually.

In order to assess the progress of the objectives listed above, the District has designated the following Performance Standard:

> The number of brochures issued and the number of public speaking programs regarding water conservation, rainwater harvesting, and brush control will be included in the annual report to the District's Board.

8.7.1. Recharge Enhancement

The District has opted to not include in this plan any management objectives related to recharge enhancement because the District does not consider these measures to be appropriate or cost effective for the District. Therefore, this goal is not applicable to the District at this time.

8.7.2. Precipitation Enhancement

The District has opted to not include in this plan any management objectives related to precipitation enhancement because the District does not consider these measures to be appropriate or cost effective for the District. Therefore, this goal is not applicable to the District at this time.

8.8. Addressing the Desired Future Condition of the Groundwater Resources in the District

Groundwater Management Area 8 has established Desired Future Conditions (DFC) for the Trinity and Woodbine aquifers within the District.

8.8.1. Trinity Aquifer (Paluxy, Glen Rose, Hensell, Pearsall/Cow Creek/Hammett, Sligo, and Hosston Formations)

Currently there is no significant use of water from the Paluxy or Glen Rose formations in McLennan County. Groundwater wells in the Trinity Aquifer are completed in a variety of ways and may be open, perforated, or screened in both the Hensell and Hosston formations. The DFC for the planning period of 2010 through 2070 (61 years) of is 542 feet of drawdown for the Hosston formation and 220 feet of drawdown for the Hensell formation (GMA8 2017, Table 4). The District will limit the total amount of groundwater produced or withdrawn from the portion of the Trinity Aquifer within the District as necessary to limit the drawdown in such formations to achieve the respective DFC.

In order to meet this goal, the District has established the following Management Objective:

> The District will measure the water level in one or more wells open, perforated, or screened in the portion of the Paluxy, Glen Rose, Hensell and/or Hosston formations within the District and shall calculate the annual and cumulative drawdown and provide such information to the District's Board of Directors.

In order to assess the progress of the objectives listed above, the District has designated the following Performance Standard:

> The District will provide a report analyzing of the effects of pumping on groundwater levels, including the annual and cumulative drawdown statistics, in the annual report to the District's Board of Directors.

8.8.2. Woodbine Aquifer

The Woodbine Aquifer is a minor aquifer that extends only into a very small portion of the northernmost part of McLennan County. The outcrop of the Woodbine occurs within the District boundaries but is covered by alluvium over much of its area. There is no or very little use of the groundwater in the portion of the Woodbine Aquifer within McLennan County and currently the District is not aware of any well that is operational in the portion of the Woodbine Aquifer that is located within the District. The average DFC for the Woodbine formation is 6 feet of drawdown per 50 years. The District will limit the total amount of groundwater produced or withdrawn from the Woodbine Aquifer as necessary to meet the DFCs.

In order to meet this goal, the District has established the following Management Objective:

> The District will locate a well screened in the Woodbine Aquifer and will annually collect the water level in one or more wells open, perforated or screened in the Woodbine Aquifer, and shall calculate the annual and cumulative drawdown and provide such information to the District's Board of Directors.

In order to assess the progress of the objectives listed above, the District has designated the following Performance Standard:

> The District will provide an analysis report of the effects from pumping on groundwater levels, including the annual and cumulative drawdown statistics in the annual report to the District's Board of Directors.

9. References

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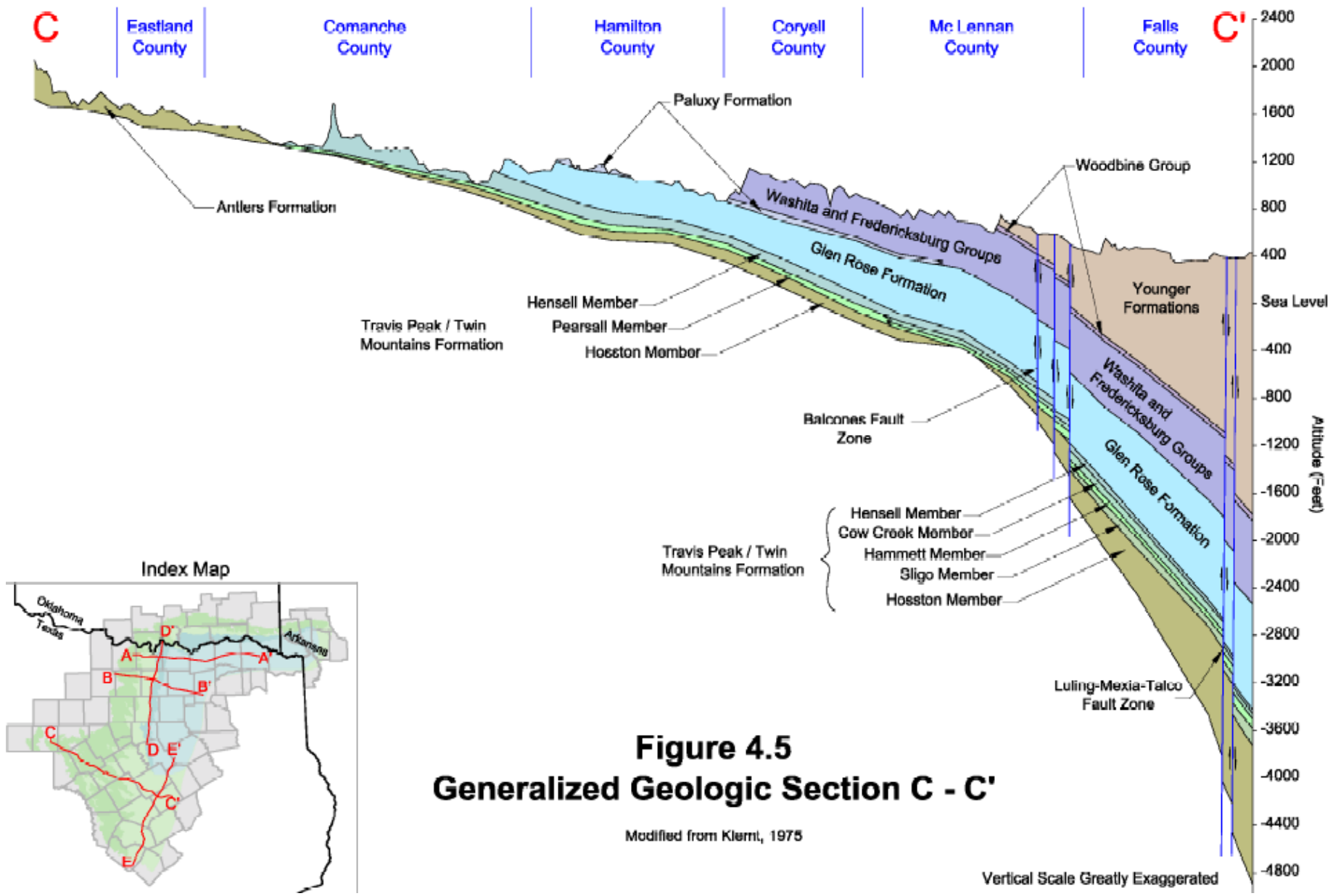

Figure 4.5
Generalized Geologic Section C - C'

Modified from Klemt, 1975

GAM Run 19-016: Southern Trinity Groundwater Conservation District Groundwater Management Plan

Shirley C. Wade, Ph.D., P.G.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Department
512-936-0883
October 23, 2019

Shirley C. Wade
10/23/19

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GAM RUN 19-016: SOUTHERN TRINITY GROUNDWATER CONSERVATION DISTRICT GROUNDWATER MANAGEMENT PLAN

Shirley C. Wade, Ph.D., P.G.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Department
512-936-0883
October 23, 2019

EXECUTIVE SUMMARY:

Texas State Water Code, Section 36.1071, Subsection (h) (Texas Water Code, 2011), 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.

The TWDB provides data and information to the Southern Trinity Groundwater Conservation District in two parts. Part 1 is the Estimated Historical Water Use/State Water Plan dataset report, which will be provided to you separately by the TWDB Groundwater Technical Assistance Department. Please direct questions about the water data report to Mr. Stephen Allen at 512-463-7317 or stephen.allen@twdb.texas.gov. Part 2 is the required groundwater availability modeling information and this information includes:

1. the annual amount of recharge from precipitation, if any, to the groundwater resources within the district;
2. 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
3. the annual volume of flow into and out of the district within each aquifer and between aquifers in the district.

The groundwater management plan for the Southern Trinity Groundwater Conservation District should be adopted by the district on or before June 17, 2020 and submitted to the Executive Administrator of the TWDB on or before July 17, 2020. The current management plan for the Southern Trinity Groundwater Conservation District expires on September 15, 2020.

We used two groundwater availability models to estimate the management plan information for the aquifers within the Southern Trinity Groundwater Conservation District. Information for the Trinity and Woodbine aquifers is from the groundwater availability model for the northern portion of the Trinity Aquifer and Woodbine Aquifer (Kelley and others, 2014). Information for the Brazos River Alluvium Aquifer is from version 1.01 of the groundwater availability model for the Brazos River Alluvium Aquifer (Ewing and Jigmond, 2016).

This report replaces the results of GAM Run 14-015 (Boghici and Wade, 2015), as the approach used for analyzing model results has been refined and this report includes results from the groundwater availability model for the Brazos River Alluvium Aquifer (Ewing and Jigmond, 2016).

METHODS:

In accordance with the provisions of the Texas State Water Code, Section 36.1071, Subsection (h), the two groundwater availability models mentioned above were used to estimate information for the Southern Trinity Groundwater Conservation District management plan. Water budgets were extracted for the historical model period for the (1980 through 2012) using ZONEBUDGET Version 3.01 (Harbaugh, 2009). The average annual water budget values for recharge, surface-water outflow, inflow to the district, and outflow from the district for the aquifers within the district are summarized in this report.

PARAMETERS AND ASSUMPTIONS:

Trinity and Woodbine Aquifers

- We used version 2.01 of the groundwater availability model for the northern portion of the Trinity Aquifer and Woodbine Aquifer. See Kelley and others (2014) for assumptions and limitations of the model.
- The groundwater availability model for the northern portion of the Trinity Aquifer and Woodbine Aquifer 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; however, the Drain package had zero discharge within the Southern Trinity Groundwater Conservation District.

- 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 aquifers according to the groundwater availability model. Selected groundwater budget components listed below were extracted from the groundwater availability model results for the Trinity, Woodbine, and Brazos River Alluvium aquifers located within the Southern Trinity Groundwater Conservation District and averaged over the historical calibration periods, as shown in Tables 1 through 3.

1. 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.

2. Surface-water outflow—the total water discharging from the aquifer (outflow) to surface-water features such as streams, reservoirs, and springs.

3. Flow into and out of district—the lateral flow within the aquifer between the district and adjacent counties.

4. Flow between aquifers—the net vertical flow between the aquifer and adjacent aquifers or confining units. This flow is controlled by the relative water levels in each aquifer 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 through 3. 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 FOR SOUTHERN 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	0
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Trinity Aquifer	0
Estimated annual volume of flow into the district within each aquifer in the district	Trinity Aquifer	12,513
Estimated annual volume of flow out of the district within each aquifer in the district	Trinity Aquifer	1,251
*Estimated net annual volume of flow between each aquifer in the district	Flow from the overlying Fredericksburg and Washita groups into the Trinity Aquifer	534

*The model assumes there is no interaction between the Trinity Aquifer and any underlying water-bearing hydrogeologic units.

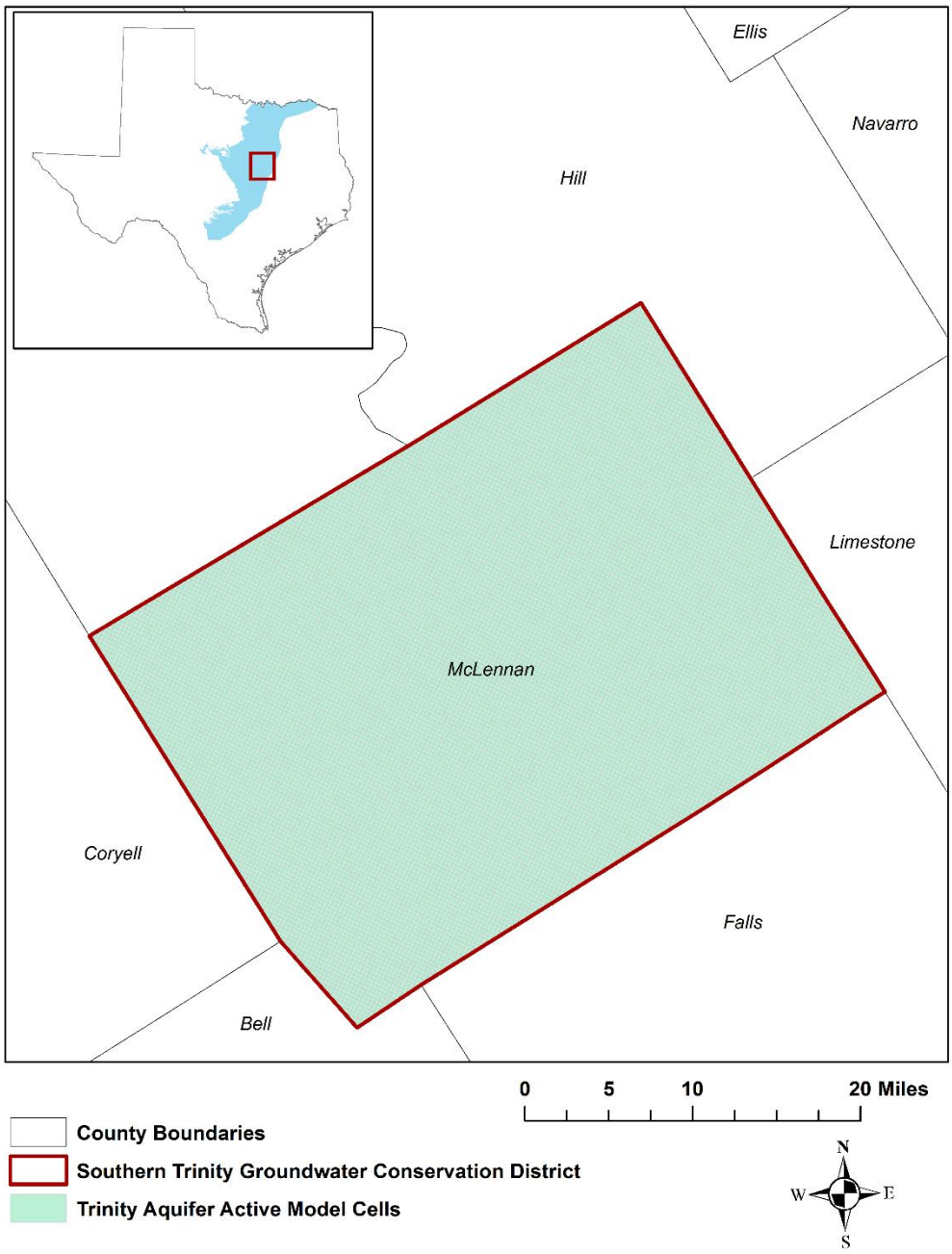

FIGURE 1 AREA OF THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AQUIFER AND WOODBINE AQUIFER FROM WHICH THE INFORMATION IN TABLE 1 WAS EXTRACTED (THE TRINITY AQUIFER EXTENT WITHIN THE DISTRICT BOUNDARY).

TABLE 2. SUMMARIZED INFORMATION FOR THE WOODBINE AQUIFER FOR SOUTHERN 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	Woodbine Aquifer	355
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Woodbine Aquifer	1,334
Estimated annual volume of flow into the district within each aquifer in the district	Woodbine Aquifer	224
Estimated annual volume of flow out of the district within each aquifer in the district	Woodbine Aquifer	7
Estimated net annual volume of flow between each aquifer in the district	Flow into the Woodbine Aquifer from younger overlying units	76
	Flow from the Woodbine Aquifer into the underlying Fredericksburg and Washita groups	50
	Flow from the Woodbine Aquifer to the downdip Woodbine Formation	1

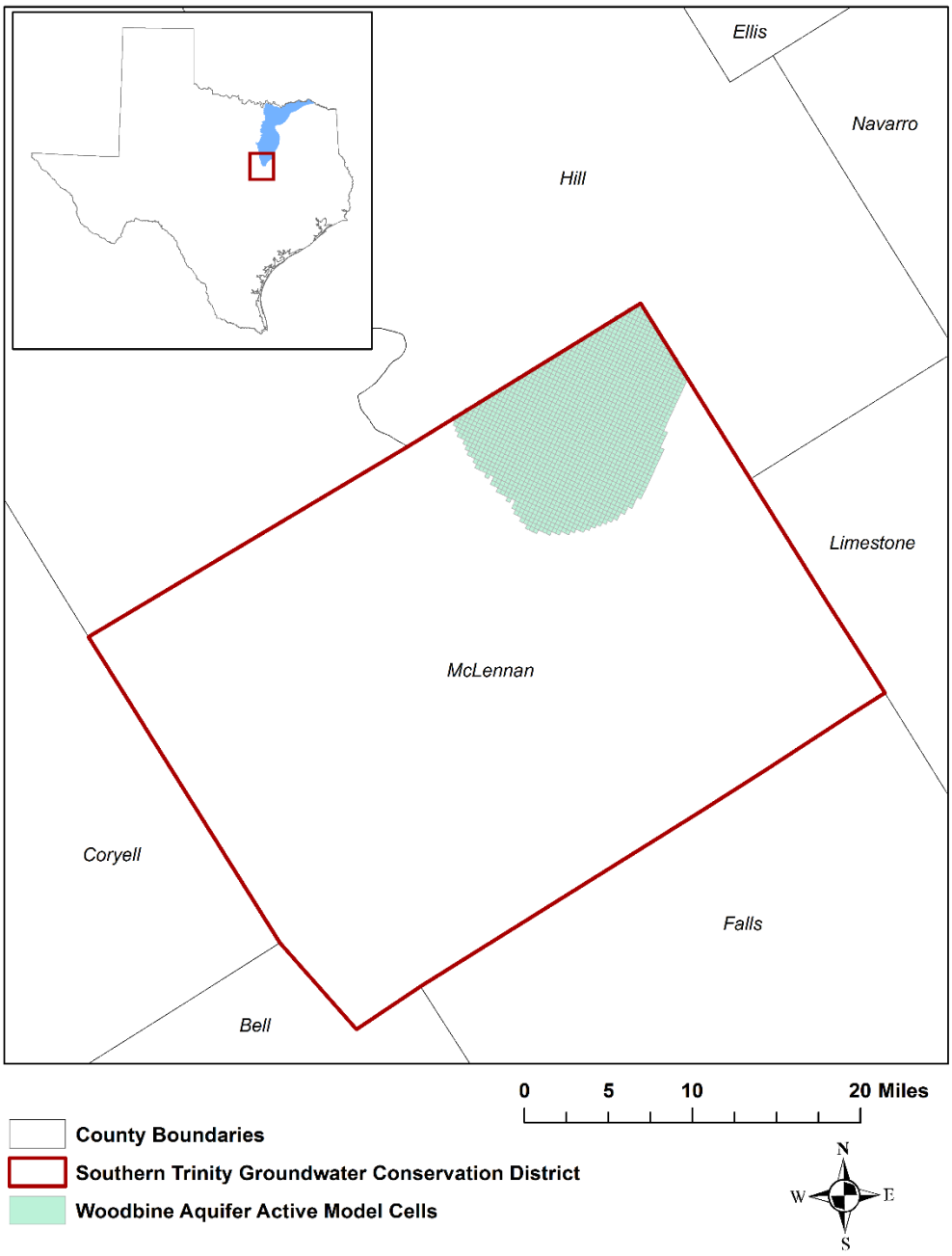

FIGURE 2 AREA OF THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AQUIFER AND WOODBINE AQUIFER FROM WHICH THE INFORMATION IN TABLE 2 WAS EXTRACTED (THE WOODBINE AQUIFER EXTENT WITHIN THE DISTRICT BOUNDARY).

TABLE 3. SUMMARIZED INFORMATION FOR THE BRAZOS RIVER ALLUVIUM AQUIFER FOR SOUTHERN 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	Brazos River Alluvium Aquifer	7,363
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Brazos River Alluvium Aquifer	13,177
Estimated annual volume of flow into the district within each aquifer in the district	Brazos River Alluvium Aquifer	21
Estimated annual volume of flow out of the district within each aquifer in the district	Brazos River Alluvium Aquifer	571
Estimated net annual volume of flow between each aquifer in the district	Flow into the Brazos River Alluvium Aquifer from underlying units	27

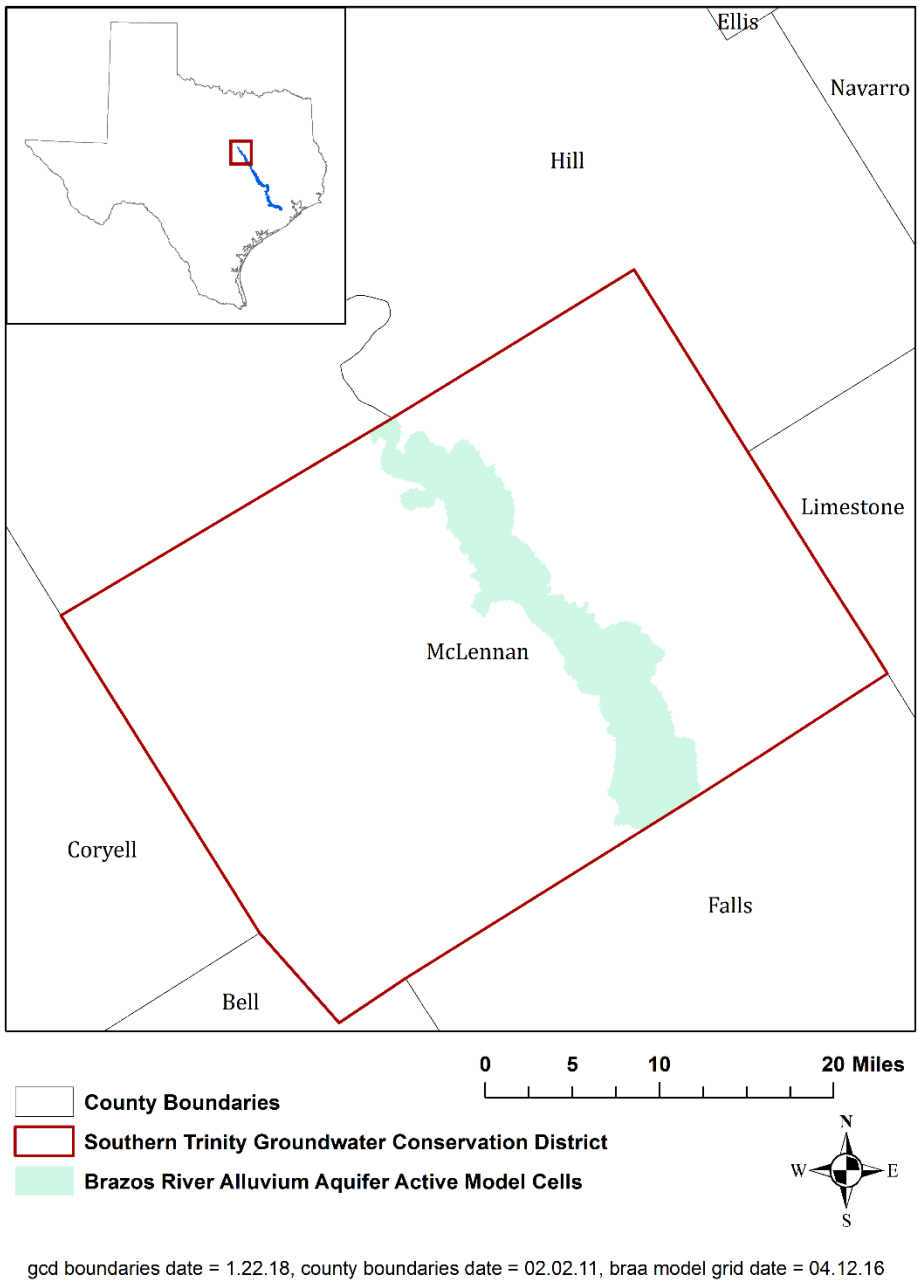

FIGURE 3 AREA OF THE GROUNDWATER AVAILABILITY MODEL FOR THE BRAZOS RIVER ALLUVIUM AQUIFER FROM WHICH THE INFORMATION IN TABLE 3 WAS EXTRACTED (THE AQUIFER EXTENT WITHIN THE DISTRICT BOUNDARY).

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 historical groundwater flow conditions includes the assumptions about the location in the aquifer where historical pumping was placed. Understanding the amount and location of historical 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 historical 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. Historical precipitation patterns also need to be placed in context as future climatic conditions, such as dry and wet year precipitation patterns, may differ and affect groundwater flow conditions.

REFERENCES:

Boghici, P.G. and Wade, S.C., 2015, GAM Run 14-015: Southern Trinity Groundwater Conservation District Management Plan, 12 p., http://www.twdb.texas.gov/groundwater/docs/GAMruns/GR14-015.pdf

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

December 17, 2008

Rodney Kroll, President
McLennan Groundwater Conservation District
4900 Sanger Avenue
Waco, Texas 76710

Re: Designation of the Central Texas Trinity Aquifer Priority Groundwater Management Area (PGMA); TCEQ Docket No. 2008-0099-MIS; SOAH Docket No. 582-08-1502

Dear Mr. Kroll:

The Texas Commission on Environmental Quality (TCEQ) designated the Central Texas Trinity Aquifer PGMA in Bosque, Coryell, Hill, McLennan, and Somervell counties and recommended a groundwater conservation district or districts be created. The TCEQ considered this matter at its public agenda in Austin on October 22, 2008, and the designation of the area became effective on October 31, 2008.

A copy of the TCEQ order designating the subject PGMA is being provided to you in accordance with Title 30 Texas Administrative Code, Section 294.43. Copies of the order have also been provided to the Texas AgriLife Extension Service requesting groundwater management educational programming in the PGMA, and to the commissioners courts of the affected counties notifying them of education responsibilities under Texas Water Code, Section 35.012(c).

If you have any questions about this matter please contact Mr. Kelly Mills of my staff at 512.239.4512 or kmills@tceq.state.tx.us.

Sincerely,

Todd Chenoweth, Director
Water Supply Division

TC/mlc

1 Enclosure/ TCEQ Docket 2008-0099-MIS; SOAH 582-08-15 designation order

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

AN ORDER Designating the Central Texas - Trinity Aquifer - Priority Groundwater Management Area and Approving the Executive Director's Recommendations Regarding Groundwater Conservation Districts in the PGMA, TCEQ Docket No. 2008-0099-MIS; SOAH Docket No. 582-08-1502

On October 22, 2008, the Texas Commission on Environmental Quality (Commission or TCEQ) considered Executive Director's Petition for Designation of the Central Texas – Trinity Aquifer – Priority Groundwater Management Area (PGMA) and the Executive Director's recommendations for creation of Groundwater Conservation Districts (GCDs) in the PGMA. The Administrative Law Judge (ALJ) with the State Office of Administrative Hearings (SOAH), presented a Proposal for Decision (PFD) which recommended that the Commission designate the Central Texas PGMA and approve the Executive Director's recommendations for creation of GCDs in the PGMA. After considering the ALJ's PFD, the Commission adopts the following Findings of Fact and Conclusions of Law:

FINDINGS OF FACT

Procedural History

1. In 1990, the Executive Director (ED) wrote a report concerning critical area designation in McLennan, Coryell, Bosque, Hill, Somervell, Brown, Erath, Callahan, Falls, Hamilton, Eastland, Bell, Lampasas, Mills, Comanche, Limestone, and Milam Counties. The Texas Water Commission decided not to designate the area at that time, but determined that the area should be restudied in the future.

2. In 1998, the ED reinitiated the study and requested reports from the Texas Water Development Board (TWDB) and Texas Parks & Wildlife Department (TPWD). The TWDB and TPWD prepared reports and sent them to the ED in 1999.

3. On October 18, 2004, the Executive Director sent notice of the initiation of the study to approximately 532 stakeholders. These stakeholders included area legislators, planning entities, county officials, municipalities, river authorities, groundwater conservation districts, water districts, entities supplying public drinking water, agricultural interest groups, selected federal and state agencies, and environmental interest groups. Seven comments were received.

4. The Executive Director mailed notice of its draft report, "Updated Evaluation for the Central Texas – Trinity Aquifer – Priority Groundwater Management Study Area," (the report) to the same stakeholders. Three stakeholders provided written comment after this notice was given.

5. When the report was final, notice of the final report was sent to the same stakeholders and notice was placed in the *Texas Register*. A copy of the draft report was placed in the county clerk's offices in the proposed PGMA, libraries and public places in the 16-county study area, and all GCDs adjacent to or in the study area.

6. Notice of the hearing was mailed on February 8, 2008, to all the stakeholders, governing bodies of each county, adjacent GCDs, river authorities, municipalities, water authorities or other entities that supply public drinking water, including each holder of a CCN, and irrigation districts in the proposed PGMA.

7. Notice of the hearing was published in the following newspapers:

The Clifton Record, Bosque County, February 29, 2008
Bosque County News, Bosque County, February 22, 2008
Gatesville Messenger, Coryell County, February 27, 2008
The Copperas Cove Leader, Coryell County, February 22, 2008
The Mart Messenger, Coryell County, February 22, 2008
The Hillsboro Reporter, Hill County, February 25, 2008
Waco Tribune Herald, McLennan County, February 27, 2008

The Lonestar Iconoclast, McLennan County, February 22, 2008
The McGregor Mirror, McLennan County, February 26, 2008
The Glen Rose Reporter, Somervell County, February 26, 2008

8. The ALJ conducted a preliminary hearing and took jurisdiction of this matter on April 3, 2008 in Waco, Texas.

9. Hearing on the merits was held May 1, 2008, in Waco, Texas.

10. At the Evidentiary Hearing, parties were allowed to present evidence and cross examine the Executive Director's witnesses.

Designation of the Central Texas – Trinity Aquifer – PGMA

11. Water needs throughout the study area are primarily met with surface water. Despite that fact, almost constant quantities of groundwater are being used in the study area.

12. The Trinity Group aquifer is the only major aquifer in the study area.

13. The Trinity Aquifer supplies about 52.9 percent of the groundwater available in the study area.

14. The Trinity Aquifer provides all of the groundwater in Callahan, Comanche, Coryell, Eastland, Erath, Hamilton, Mills, and Somervell Counties.

15. The major portion of groundwater used in Bell, Brown, and Hill counties is from the Trinity Aquifer.

16. The Trinity Aquifer supplies water to Bosque and McLennan Counties.

17. The population of the study area will increase by approximately 32.5 percent from 2000 to 2030.

18. Bosque, Coryell, and Somervell Counties will experience an increase in population from 2000 to 2030 of more than 30% percent.

19. Major water level declines occur in areas of high groundwater usage in the study area.

20. Groundwater declines occur only in the confined portion of the Trinity aquifer and not in the outcrop or recharge zones. In the outcrop area the water levels fluctuate according to the amount of rainfall. Counties in the outcrop area are in the western part of the study area, and include Erath, Comanche, Lampasas, and Hamilton, Callahan, Brown, Eastland, and Mills counties

21. More groundwater is being withdrawn than is effectively recharged to aquifers in the Central Texas PGMA study area.

22. Historically, pumpage in the study area has exceeded effective recharge resulting in declining water levels, removal of water from aquifer storage, and possible deterioration of chemical quality.

23. The greatest groundwater level declines in the study area are from wells completed in the Trinity Aquifer Hosston Formation in the Waco metropolitan area in McLennan County with declines of over 400 feet. The Trinity Aquifer Hensell Formation has also recorded significant water-level declines with well over 200 feet of decline in Coryell County. Declines from 171 feet have been shown in Somervell County, and 337 feet in Bosque County.

24. The 2004 GAM Report for the Northern Trinity/Woodbine Aquifer indicates that the model runs predict future water-level drawdown and recovery in the study area. Up to 100 feet of drawdown is predicted to occur in Bosque, Falls, Limestone, and McLennan counties. Although the report indicates that artesian pressure could recover due to reduction in pumping, the predictive simulation very likely underestimated future pumping and future pumping would likely be at the same or greater levels.

25. The 2006 Region G Water Plan states that the present use of groundwater exceeds or is near the estimate of long-term reliable groundwater supply in many counties in the study area. The pumping in Bell, Bosque, Callahan, Coryell, Eastland, Erath, Falls, Hill, Lampasas, Limestone, McLennan and Somervell counties is at or above the estimated long term sustainable supply.

26. The 2007 State Water Plan (draft at the time of the report) illustrates that the most significant historical water-level declines in the state have occurred in the Trinity aquifer in the study area centered in McLennan County. Also, there are water level declines of between 50 and 250 feet from 1994 to 2004 in Bell, Bosque, Falls, Hill and McLennan counties

27. The "Assessment of Groundwater Use in the Northern Trinity Aquifer Due to Urban Growth and Barnett Shale Development" (the Barnett Shale report) was prepared because the TWDB was concerned about the effects of growth and gas exploration on groundwater resources in the area. These effects were not considered in the Region G Plan.

28. Bell County has a GCD, the Clearwater Underground Water Conservation District.

29. Falls and Limestone County do not anticipate new groundwater users or significant new demands on the Trinity Aquifer through the year 2030.

30. The Barnett Shale report finds that water use for the study area is likely to increase to 2.1 million acre feet of water by 2025; Barnett Shale use may rise from about 10,000 to about 25,000 acre feet per year; and groundwater modeling results suggest that water levels may decline from less than 10 to more than 150 feet.

31. Barnett Shale water use and demand projections could push Trinity aquifer use above the regional water plan estimates of sustainable supply for Bosque, Comanche, Erath, Hamilton, Hill, and Somervell counties.

32. There is no historical use of groundwater from Hamilton County for exploration or production in the Barnett Shale.

33. Erath and Comanche are already in confirmed GCDs.

34. Water quality has been impacted by long-term urbanization of the region and other activities such as confined animal feeding operations.

35. Groundwater use can decrease groundwater reserves, which impacts the springs, which in turn impacts species that rely on surface water. Long term decreases in groundwater can exacerbate water quality and impact these species.

36. Designation of the area as a PGMA could lead to more efficient use of existing water resources of the area.

37. Coryell, Hill, Bosque, McLennan, and Somervell Counties are experiencing or are expected to experience critical groundwater problems in the next 25 years.

38. The other eleven counties in the study area, except Eastland County, are not experiencing critical groundwater problems within the next 25 years.

39. Eastland County, which has experienced and may continue to experience water shortages for irrigation, does not appear to have any long term water level declines in the Trinity aquifer. This indicates that there has been no significant mining of the aquifer in Eastland County.

Groundwater Conservation District Recommendations

40. There are no federal or state agencies that have the authority to regulate groundwater in this area, and local governments cannot provide the type of groundwater regulation required to protect these resources.

41. GCDs are statutorily charged and authorized to manage groundwater resources within their jurisdiction. They have many powers, such as enacting rules requiring well permits, regulating spacing of wells, and regulating transfers of groundwater out of the districts.

42. GCDs must adopt management plans and join other districts in a Groundwater Management Area (GMA) in joint planning, including determining "desired future conditions" for the aquifers in the GMA.

43. Management through a GCD or GCDs would be the best management option for the five counties in the PGMA.

44. GCDs are the preferred method of groundwater management in the State.

45. The proposed PGMA could benefit from GCD monitoring, assessment, planning, and permitting programs as well as water well spacing and well closure programs for the Trinity Aquifer.

46. A GCD must generate revenue, usually though a property tax or from well production fees.

47. The feasibility of a GCD is dependent upon many factors, including the size and total tax base of the GCD, the quantity of water that is subject to production fees, and the scale and scope of the programs undertaken by the GCD.

48. Creation of a GCD or GCDs in the PGMA is feasible and practicable.

49. A minimum of about $250,000 in revenue must be generated annually to operate a single-county GCD and fund meaningful groundwater management programs.

50. Under Chapter 36 of the Texas Water Code, a GCD may not levy a tax at a rate exceeding 50 cents per $100 assessed valuation to pay for maintenance and operating expenses.

51. Within the proposed PGMA, only McLennan County could generate tax revenue to support a single-county GCD if the rate was less than $0.01 per $100 valuation.

52. Counties in the PGMA other than McLennan would require higher tax rates, but it is feasible to create a GCD with tax powers in those counties.

53. A multi-county GCD would be more economical, have the money to perform more regulatory functions, and would cover a larger area of the aquifer.

54. It is doubtful that any of the counties in the PGMA study area would be able to finance meaningful single-county GCD operation through well production fees alone.

55. Funding of a GCD by both property taxes and production fees is the best option for the PGMA counties.

56. One GCD in all five counties is the most feasible, economic, and practicable option for protection and management of the groundwater resources. This would also avoid duplication of administrative and groundwater management programs and would cover the largest area of the aquifer. Local committees could be established for localized input.

57. Two GCDs have already been created in the proposed PGMA by legislation. These two districts are the McLennan County GCD and the Tablerock GCD in Coryell County. The legislation for both GCDs requires that by September 1, 2011, both of the GCDs' boundaries must include one adjacent county, or the districts shall be dissolved by the TCEQ. Neither GCD has been confirmed as yet.

58. If both GCDs are confirmed and a county is added to both GCDs, two multi-county GCDs in the proposed PGMA would be the best option for the PGMA. One GCD would consist of Bosque, Somervell, and Coryell Counties, and the other would consist of McLennan and Hill Counties.

CONCLUSIONS OF LAW

Jurisdiction and Notice

1. Texas Water Code § 35.008(a) gives the Commission authority to designate a PGMA in the Central Texas Trinity Aquifer Area.

2. SOAH has jurisdiction over matters related to the hearing in this matter, including the authority to issue a proposal for decision with Findings of Fact and Conclusions of Law, under Tex. Gov't Code Chapter 2003; Tex. Water Code § 35.008.

3. SOAH obtained jurisdiction of this matter on April 3, 2008.

4. The Executive Director provided notice of the commencement of his PGMA study as required by Tex. Water Code § 35.007(c) and Tex. Admin. Code Chapter 294.

5. The Executive Director provided notice of this PGMA report as required by Tex. Water Code § 35.007(g) and Tex. Admin. Code Chapter 294.

6. The Executive Director provided notice of the evidentiary hearing as required by Tex. Water Code § 35.009 and Tex. Admin. Code Chapter 294.

Hearing

1. An evidentiary hearing concerning the creation of a PGMA was held in one of the counties in which the PGMA would be located as required by Tex. Water Code § 35.008(c).

2. The evidentiary hearing concerning creation of the PGMA complied with Tex. Water Code § 35.008.

PGMA Designation

1. The hearing on the petition to designate the Central Texas – Trinity Aquifer – PGMA was conducted in accordance with Water Code Chapter 35 and the Commission's and SOAH's applicable procedural rules.

2. Under Tex. Water Code § 35.007(a), PGMAs are those areas of the State that are experiencing or are expected to experience, within the immediately following 25-year period, critical groundwater problems, including shortages of surface water or groundwater, land subsidence resulting from groundwater withdrawal, and contamination of groundwater supplies.

3. The five counties of Bosque, McLennan, Hill, Coryell, and Somervell are experiencing or are expected to experience, within the immediately following 25-year period, critical groundwater problems, including shortages of surface water or groundwater.

Creation of a District

1. Tex. Water Code § 35.008(b) and (g) require the TCEQ to consider and recommend whether one of more GCDs should be created over all or part of a PGMA, whether all or part of the land in the PGMA should be added to an existing district, or whether a combination of these actions should be taken.

2. Tex. Water Code § 35.008(b) requires the TCEQ to determine whether a GCD is feasible and practicable.

3. GCDs are the best management tool for the PGMA.

4. GCDs are feasible and practicable in the five-county PGMA.

5. If elections do not confirm McLennan County GCD and Tablerock GCD, the most practicable and feasible GCD option for the five-county PGMA is one GCD that covers all five counties.

6. Because two GCDs, McLennan County and Tablerock GCD, have been legislatively created in the PGMA, and both GCDs are required to add a county by September 1, 2011, and, if either or both GCDs add a county by September 1, 2011, and are confirmed by September 1, 2012, then the most feasible and practicable option for GCD creation is two GCDs. One GCD would consist of Bosque, Somervell, and Coryell Counties, and the other would consist of McLennan and Hill Counties.

7. The enabling legislation of the McLennan District and the Tablerock District allow those districts to have until September 1, 2012, to be confirmed at a confirmation election.

EXPLANATION OF CHANGES TO ALJ'S OCTOBER 24, 2005 ORDER

During its October 22, 2008, open meeting, the Commission adopted all but one of the revisions to the proposed Order recommended by the ALJ in his September 9, 2008 letter, as thereafter revised by the ALJ during his presentation during the October 22, 2008 meeting. The ALJ during his presentation read during the open meeting a revised Conclusion of Law No. 6, which he requested replace the version that he earlier recommended in his September 9, 2008 letter. By letter dated October 22, 2008, and distributed to all parties, the ALJ states how Conclusion of Law No. 6 was revised by the ALJ and read at the open meeting. However, while the ALJ recommended on page 5 of his September 9, 2008 letter the addition of proposed Conclusion of Law No. 9 as recommended by the Executive Director in his response to McLennan County Groundwater Conservation District's exceptions, the Commission did not adopt that recommendation and voted to deny the recommendation to add Conclusion of Law No. 9 to its order. Accordingly, this Order contains the revisions the ALJ recommended to Finding of Fact Nos. 27, 28, 41, 57, and 58, and to Conclusions of Law Nos. 3 and 6. It also contains new Conclusion of Law No. 7 as requested by McLennan GCD and recommended by the ALJ on page four of his September 9, 2008 letter.

The Commission also adopted the two minor revisions to Finding of Fact No. 1 and Finding of Fact No. 20 recommended by the Executive Director during the October 22, 2008 open meeting. Thus, revised Finding of Fact No. 1 in this Order includes a reference to Milam County along with the references to the other 16 counties that were included in the 1990 report, and the third sentence in Finding of Fact No. 20 is revised to refer to the western part of the study area and not to the eastern part of the study area as requested by the Executive Director. The Commission also determined to add a new Ordering Provision, which is Ordering Provision

No. 5 in this Order, which requires the Commission's Chief Clerk to forward a copy of this order to all persons on the mailing list for this matter.

NOW, THEREFORE, BE IT ORDERED BY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY THAT:

1. The Central Texas – Trinity Aquifer – PGMA be created to cover Bosque, McLennan, Coryell, Hill, and Somervell Counties.

2. All other motions, requests for entry of specific findings of fact or conclusions of law and any other requests for general or specific relief not expressly granted herein are hereby DENIED for want of merit.

3. The effective date of this Order is the date the Order is final as provided by Tex. Gov't Code § 2001.144.

4. If any provision, sentence, clause, or phrase of this Order is for any reason held to be invalid, the invalidity of any portion shall not affect the validity of the remaining portions of the Order.

5. The Chief Clerk of the Texas Commission on Environmental Quality shall forward a copy of this order to all persons on the mailing list for this matter.

Issue Date: OCT 31 2008

TEXAS COMMISSION ON
ENVIRONMENTAL QUALITY

Buddy Garcia

Buddy Garcia, Chairman

The Brazos River Alluvium Aquifer Flow System in McLennan County, Texas

Technical Memo
11-1-08

by
Joe C. Yelderman Jr.

Baylor University
Department of Geology
Waco, Texas

The Brazos River Alluvium Aquifer Flow System in McLennan County, Texas

Introduction

The Brazos River alluvium is composed of interbedded sediments ranging in size from clays to gravels. These sediments were deposited by the Brazos River and occur both in the modern floodplain and in terraces. The lower (younger) terraces in some locations are laterally contiguous with the modern floodplain and hydrologically connected but in other locations they are separated topographically by underlying bedrock formations that are less permeable. In some places the Brazos River sediments have been reworked by tributary streams and redeposited in the floodplain or terraces along with the local tributary deposits. These processes have formed a sediment package with interfingering laterally and multiple fining-upward sequences vertically. The result is a complex geological framework for an unconfined aquifer that has significant lateral and vertical heterogeneity. Because these alluvial sediments occur immediately adjacent to the present Brazos River channel, a hydrologic connection between groundwater and surface water appears obvious. Groundwater levels are known to fluctuate in response to river levels indicating a fairly direct connection (Cronin and Wilson,1967; Pinkus,1987). However, the flow directions are less obvious to the casual observer and because of the system heterogeneity, recharge and discharge volumes are difficult to quantify. This technical memo describes the flow system for the Brazos River Alluvium Aquifer in McLennan County and estimates the annual recharge and discharge volumes.

Flow System Description

A flow system is the groundwater flow in a portion of an aquifer that occurs from recharge area to point of discharge. The description of a flow system includes the area (or location) of groundwater recharge, the direction of groundwater flow and the area (or location) of groundwater discharge. In most cases it includes the sources of the recharge and the methods of discharge. These characteristics specific to the Brazos River Alluvium Aquifer in McLennan County are described below.

Flow Directions

The groundwater in the Brazos River Alluvium Aquifer in McLennan County flows toward the Brazos River with few exceptions (Cronin and Wilson, 1967; Harlan, 1990; Pinkus, 1987; Turco and others, 2007). In the floodplain the flow is predominately

toward the Brazos River and slightly down-valley. However, in the terraces, tributaries may influence the groundwater flow and locally deflect flow toward the tributary channel (Harlan, 1985). Pumping, especially high-volume pumping such as dewatering efforts by local surface mining may temporarily modify local flow directions. Mine reclamation and landfill activities may permanently modify local flow directions.

Recharge Areas

Recharge occurs over the entire alluvium surface although recharge is greater in areas with sandier soils than where clay soils occur. Open pits from surface mining or other activities may allow more direct recharge and act as point-source recharge areas. Lateral flow occurs from adjacent bedrock formations on the outer edges of the alluvium. The Brazos River Alluvium Aquifer in McLennan County receives some lateral flow from the contiguous alluvial deposits in Hill County.

Recharge Sources

Recharge occurs primarily from precipitation, which is almost exclusively rainfall in McLennan County. However, additional sources of recharge occur in the form of infiltration as a result of flood water inundation, lateral flow from adjacent formations, vertical flow from underlying formations, infiltration from losing streams, leaky pipes and tanks containing water from outside sources, leach field infiltration from on-site wastewater treatment if the water came from an outside source and infiltration from irrigation applications which originated from surface water or another aquifer other than the Brazos River Alluvium Aquifer.

Floodwater inundation is infrequent and is probably not significant over a long period. However, it could be important for the season or year in which it occurs.

The bedrock formations that abut the alluvium are not considered aquifers but could contribute some lateral flow. This lateral flow may be locally important if the adjacent geologic unit is a fairly large terrace with substantial amounts of sand or gravel.

The bedrock formations underneath the alluvium are not considered aquifers and the head in the alluvium is generally thought to be higher than the head in these underlying formations. Therefore, the vertical flow would be downward rather than upward and these underlying units probably would not contribute water to the alluvium aquifer in McLennan County.

There are a few losing streams within the Brazos River Alluvium Aquifer in McLennan County and they are localized in area. Therefore, they probably contribute only a small portion of the total recharge (Cronin and Wilson, 1967).

Leaky pipes and tanks are not considered a significant source of recharge but there are few data available to quantify their contribution.

The amount of leachfield infiltration is unknown but leachfields are designed to have a significant amount of evapotranspiration and probably do not contribute a significant amount to the total volume of recharge to the Brazos River Alluvium Aquifer in McLennan County at this time.

There is some lawn irrigation from municipal water supplies and some turf grass irrigation directly from the Brazos River but most agricultural irrigation water in the past originated from the Brazos River Alluvium Aquifer and did not contribute significantly to the overall recharge volume.

Recharge to the Brazos River Alluvium Aquifer in McLennan County also occurs as lateral flow downgradient within the alluvium from Hill County.

Discharge Areas

Discharge in McLennan County occurs as seeps and springs along the Brazos River and in some cases as seeps and springs along tributaries. Point source discharge occurs at pumping wells and open pits which intersect the water table. The down-valley flow component of the Brazos River Alluvium Aquifer results in groundwater flow out of McLennan County to alluvial deposits in Falls County

Discharge Sources

Discharge occurs primarily as seeps and springs into the Brazos River and tributaries. However, additional sources of discharge in McLennan County include pumping wells, open pits that are being dewatered, evapotranspiration from surface water bodies, wetland areas that intersect the water table and down-valley flow from McLennan County to Falls County. The majority of the discharge is thought to occur as seeps and springs to the Brazos River.

Annual Recharge Volumes

Methods

The estimate of recharge to the Brazos River Alluvium Aquifer in McLennan County calculated in this memo focused on the recharge from precipitation and considered the other potential sources of recharge to be either insignificant in volume or impractical to calculate accurately. Using GIS and published maps for the Brazos River Alluvium in McLennan County, Bruce Byars from the Center for Spatial Research at Baylor University calculated there were 62,442 acres of Brazos River Alluvium exposed on the surface and available for recharge in McLennan County. Cronin and Wilson (1967) estimated the annual recharge for Falls County was 2.1 inches (.175 feet). Since Falls County and McLennan County are adjacent to each other and their climates are similar, the annual recharge for Falls County was used for McLennan County and Multiplied by the alluvium outcrop area (.175 feet/year * 62,442 acres).

The down-valley flow was calculated using Darcy's Law ($Q=KIA$; where Q = the volumetric flow rate, K = hydraulic conductivity, I = water table gradient, and A = the cross sectional area perpendicular to the discharge flow direction)

Results

The recharge depth times the recharge area resulted in 10,927 acre-feet/year, but other recharge sources may contribute additional recharge. It is also probable that some of the area mapped as alluvium is covered with impermeable surfaces such as streets and roof tops that would deflect potential recharge precipitation to runoff. Therefore a reasonable estimate of the annual recharge to the Brazos River Alluvium Aquifer in McLennan County is approximately11,000 acre-feet.

Annual Discharge Volumes

Methods

The estimate of discharge from the Brazos River Alluvium Aquifer in McLennan County calculated in this memo focused on the discharge from seeps and springs into the Brazos River and considered the other potential sources of discharge to be either insignificant in volume or impractical to calculate accurately. Using GIS and published maps for the Brazos River in McLennan County, Bruce Byars from the Center for Spatial Research at Baylor University calculated there were 21.46 miles of river in McLennan County. I used two methods to calculate discharge and then estimated the amount to be something in between the two calculations. The first method was a version of Darcy's law and the second was based on seepage meters measured by Harlan (1990).

Darcy's law (Q=KIA; where Q = the volumetric flow rate, K = hydraulic conductivity, I = water table gradient, and A = the cross sectional area perpendicular to the discharge flow direction) was used to calculate the volumetric flow rate per day (Q = ft^3/day, K = ft/day, I = ft/ft and A = ft^2) and then the result was multiplied by 365 days per year to get the annual discharge in ft^3/year. The volume of annual discharge was then converted from ft^3/year to acre-feet/year for comparison with other volumes used in groundwater management.

Harlan (1990) placed seepage meters in several areas of the Brazos River and measured the seepage rate in ft^3/sec. Each seepage meter was 2.62 ft^2 in area. I estimated the seepage area for each side of the river to be approximately 10 feet since most seepage into lakes and rivers occurs along the edges.

Results

Darcy's law: Cronin and Wilson (1967) reported K values from 4.72×10^{-8} cm/sec to 8.49×10^{-2} cm/sec. I used a mid-range value of 3×10^{-4} ft/sec (9461 ft/yr). Harlan reported gradients in the floodplain from 10 to 14.5 feet/mile. I used the mid-range value of 12 feet/mile or .00227 ft/ft. The area was calculated using 113,332 feet of linear river in McLennan County multiplied by an average of 20 feet of saturated section for a cross-sectional area of 2,266,640 ft^2 and this was multiplied by the 2 sides of the river resulting in 4,533,280 ft^2. The area (ft^2) was then multiplied by the hydraulic conductivity, K (ft/year) and the gradient (12 feet/5280 feet) to get ft^3/year. The volumetric rate in ft^3/year was then multiplied by .0000229568 acre-feet/ft^3 and the result is 2237 acre-feet/year of discharge.

Seepage meters: Using the linear river footage of 113332 feet multiplied by the 10 feet of seepage area times 2 for each side of the river and then dividing by the 2.62 ft^2 for each seepage meter resulted in 865,130 seepage meters. The rate of seepage was determined by Harlan (1990) to be 152.5 ft^3/year for each seepage meter (or each 2.62ft^2). Therefore the discharge along the Brazos River in McLennan County would be 865,130 times 152.5 ft^3/year resulting in 131,932,325 ft^3/year. When converted to acre-feet/year the result is a discharge volume of 3028 acre-feet/year.

The results from the two methods described above are on the same order of magnitude and indicate that seeps and springs from the Brazos River Alluvium Aquifer probably contribute about 2500 acre-feet/year to the Brazos River.

Discussion

The data available for these calculations are limited in space and time. Much more research needs to be conducted specific to the area of McLennan County in order to develop better data. The difference between the recharge and discharge volumes indicates that either the calculations are incorrect due to inaccurate data or there are additional sources of discharge that were not considered in this approach. Increased urbanization continues to change the recharge and discharge of the Brazos River Alluvium Aquifer in McLennan County and should probably be monitored in order to accurately assess any changes.

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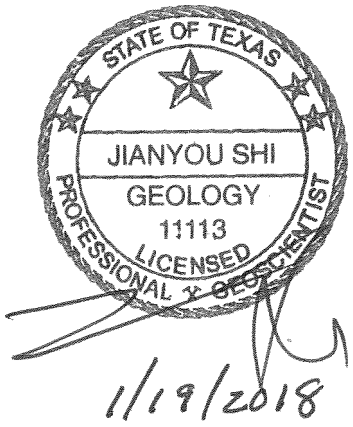
Turco, Michael J., East, Jeffery W. and Milburn, Matthew S., 2007, Base flow (1966-2005) and streamflow gain and loss (2006) of the Brazos River, McLennan County to Fort Bend County, Texas: U.S. Geological Survey Scientific Investigations Report 2007-5286, 27 p.

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



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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 Table 1, and by river basins, regional planning areas, and counties in Table 13.

- 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 Table 2, and by river basins, regional planning areas, and counties in Table 14.
- 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 Table 3, and by river basins, regional planning areas, and counties in Table 15.
- 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 Table 4, and by river basins, regional planning areas, and counties in Table 16.
- 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 Table 5, and by river basins, regional planning areas, and counties in Table 17.
- 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 Table 6, and by river basins, regional planning areas, and counties in Table 18.
- 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 Table 7, and by river basins, regional planning areas, and counties in Table 19.
- 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 Table 8, and by river basins, regional planning areas, and counties in Table 20.
- 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 Table 9, and by river basins, regional planning areas, and counties in Table 21.

- 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 Table 10, and by river basins, regional planning areas, and counties in Table 22.
- 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 Table 11, and by river basins, regional planning areas, and counties in Table 23.
- Hickory Aquifer – The modeled available groundwater is approximately 3,600 acre-feet per year from 2010 to 2070, and is summarized by groundwater conservation districts and counties in Table 12, and by river basins, regional planning areas, and counties in Table 24.

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

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):

County	Adopted Desired Future Condition (feet of drawdown below 2009 levels)							
	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	—	—	—

County	Adopted Desired Future Condition (feet of drawdown below 2009 levels)							
	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 County (crop)	Adopted Desired Future Conditions (feet of drawdown below 2009 levels)			
	Antlers	Paluxy	Glen Rose	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	—	—	—

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.

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.

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. Appendix A 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.

- 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

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).

- During the predictive simulation model run, some model cells went dry (Appendix C). 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).

- 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 (Appendix D). 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 Table 2. Table 14

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 Table 3. Table 15 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 Table 4. Table 16 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 Table 5. Table 17 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 Table 6. Table 18 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

summarized by groundwater conservation district and county in Table 7. Table 19 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 acre-feet 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 Table 8. Table 20 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 Table 9. Table 21 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 Table 10. Table 22 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 Table 11. Table 23 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

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

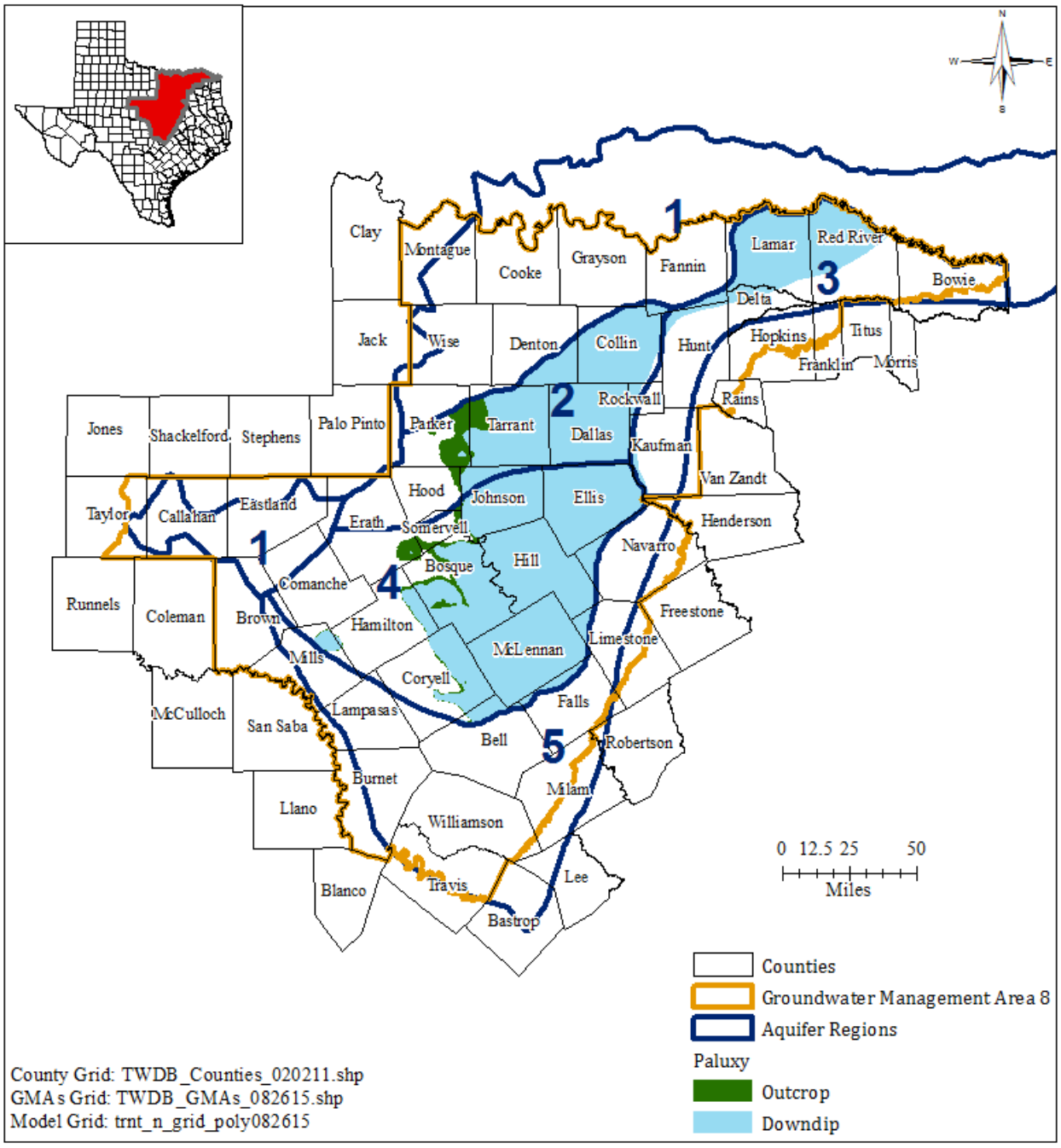

FIGURE 1. MAP SHOWING THE TRINITY AQUIFER (PALUXY) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS.

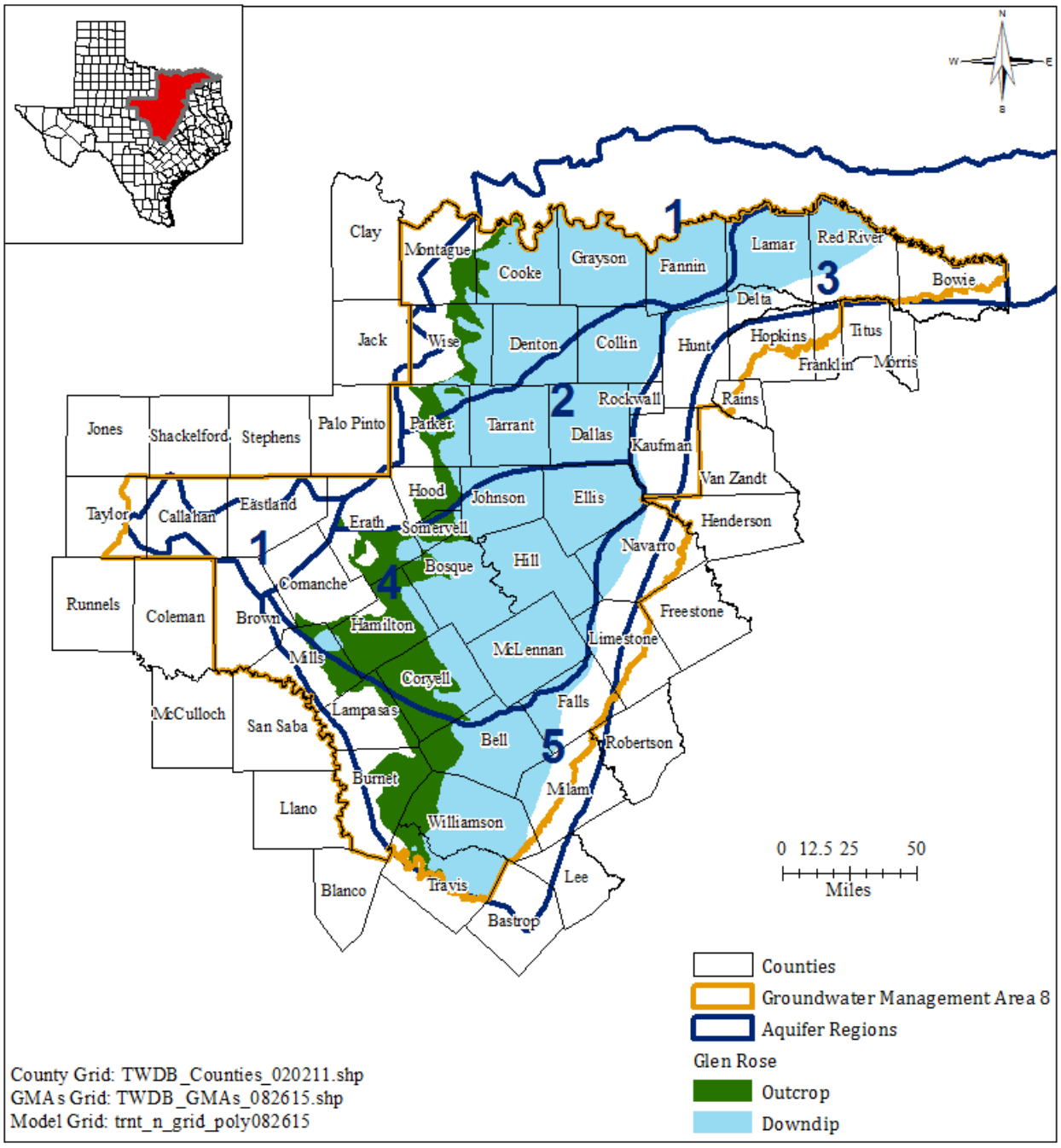

FIGURE 2. MAP SHOWING THE TRINITY AQUIFER (GLEN ROSE) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS.

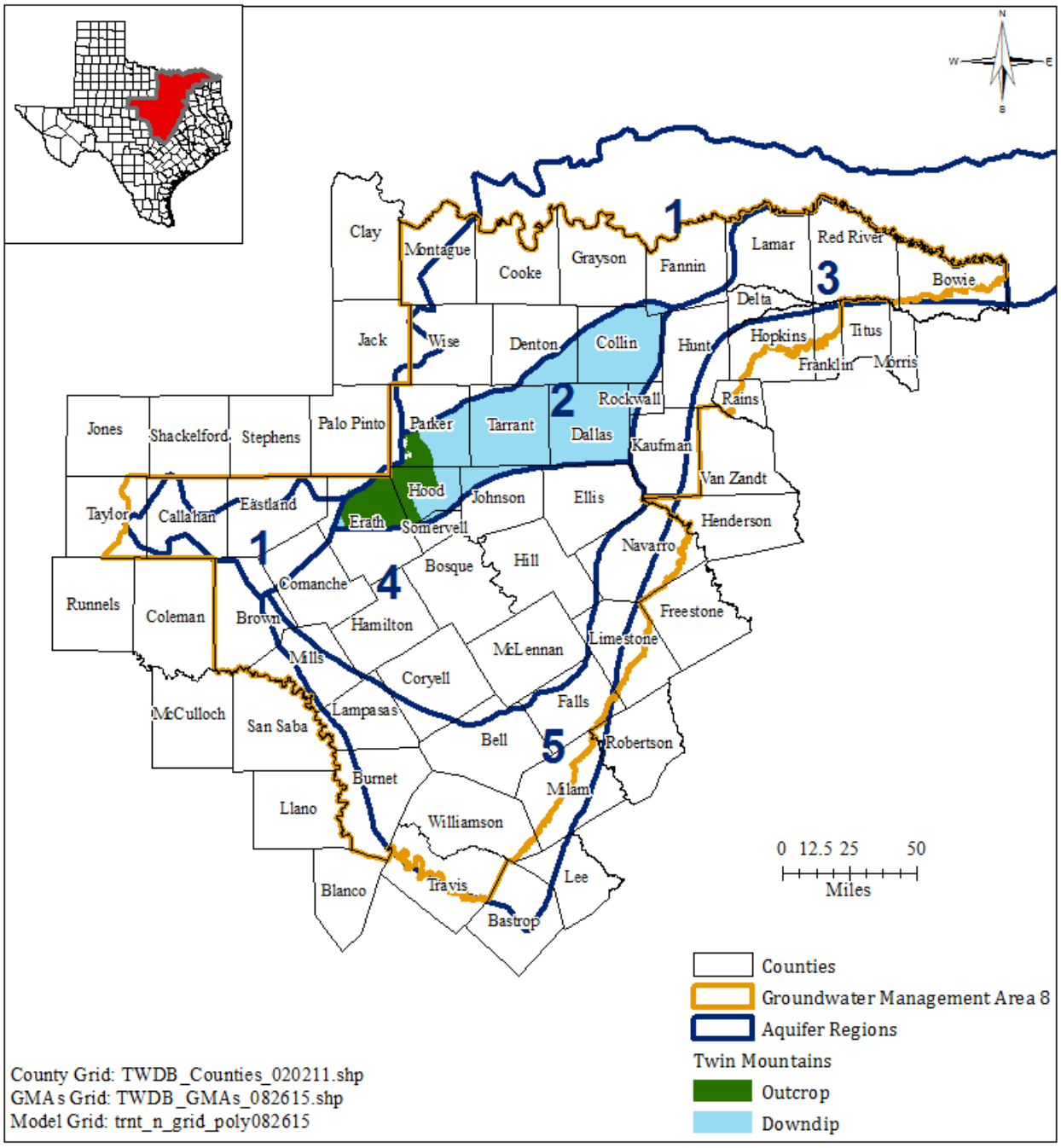

FIGURE 3. MAP SHOWING THE TRINITY AQUIFER (TWIN MOUNTAINS) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS.

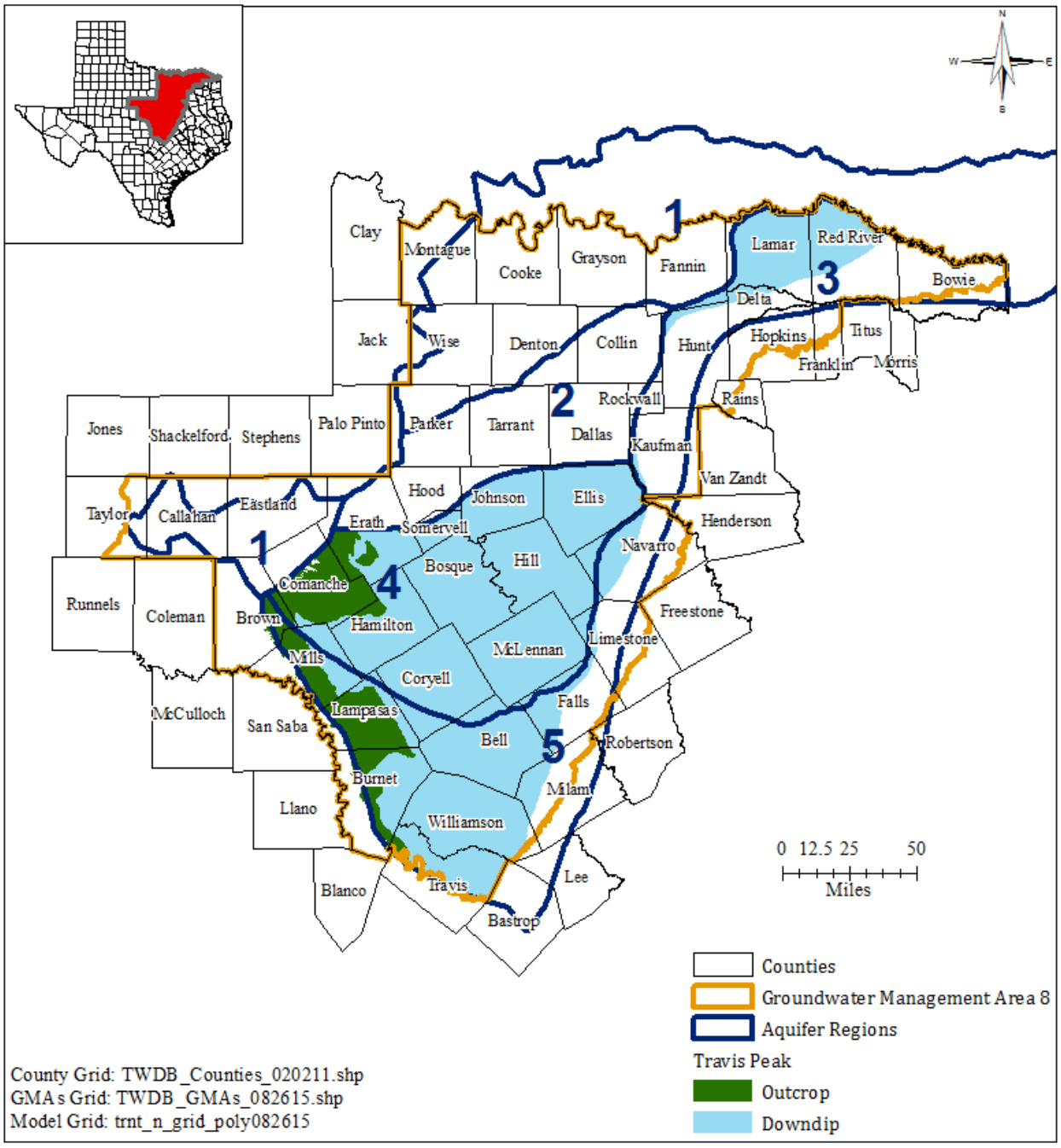

FIGURE 4. MAP SHOWING THE TRINITY AQUIFER (TRAVIS PEAK) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS.

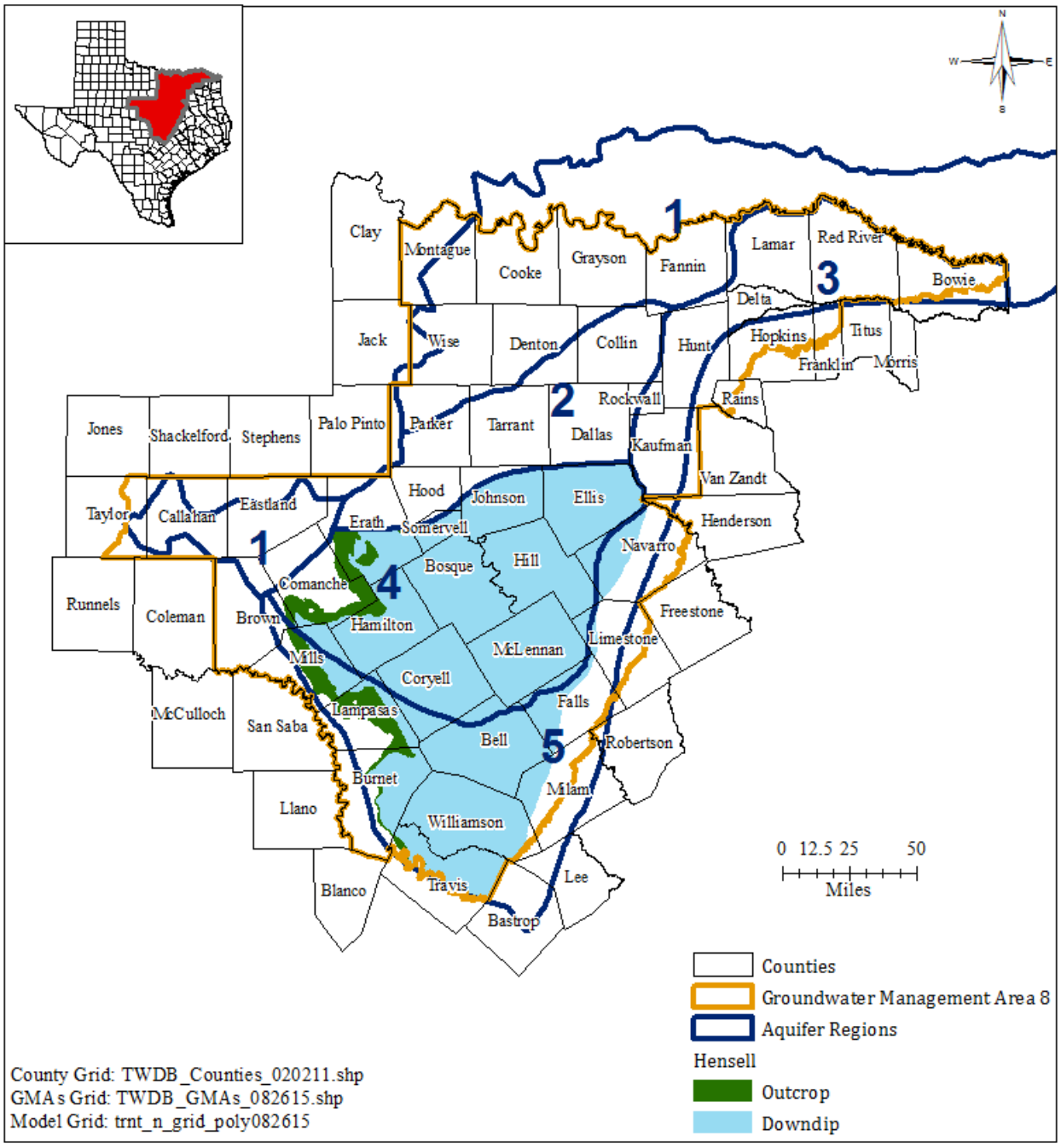

FIGURE 5. MAP SHOWING THE TRINITY AQUIFER (HENSELL) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS.

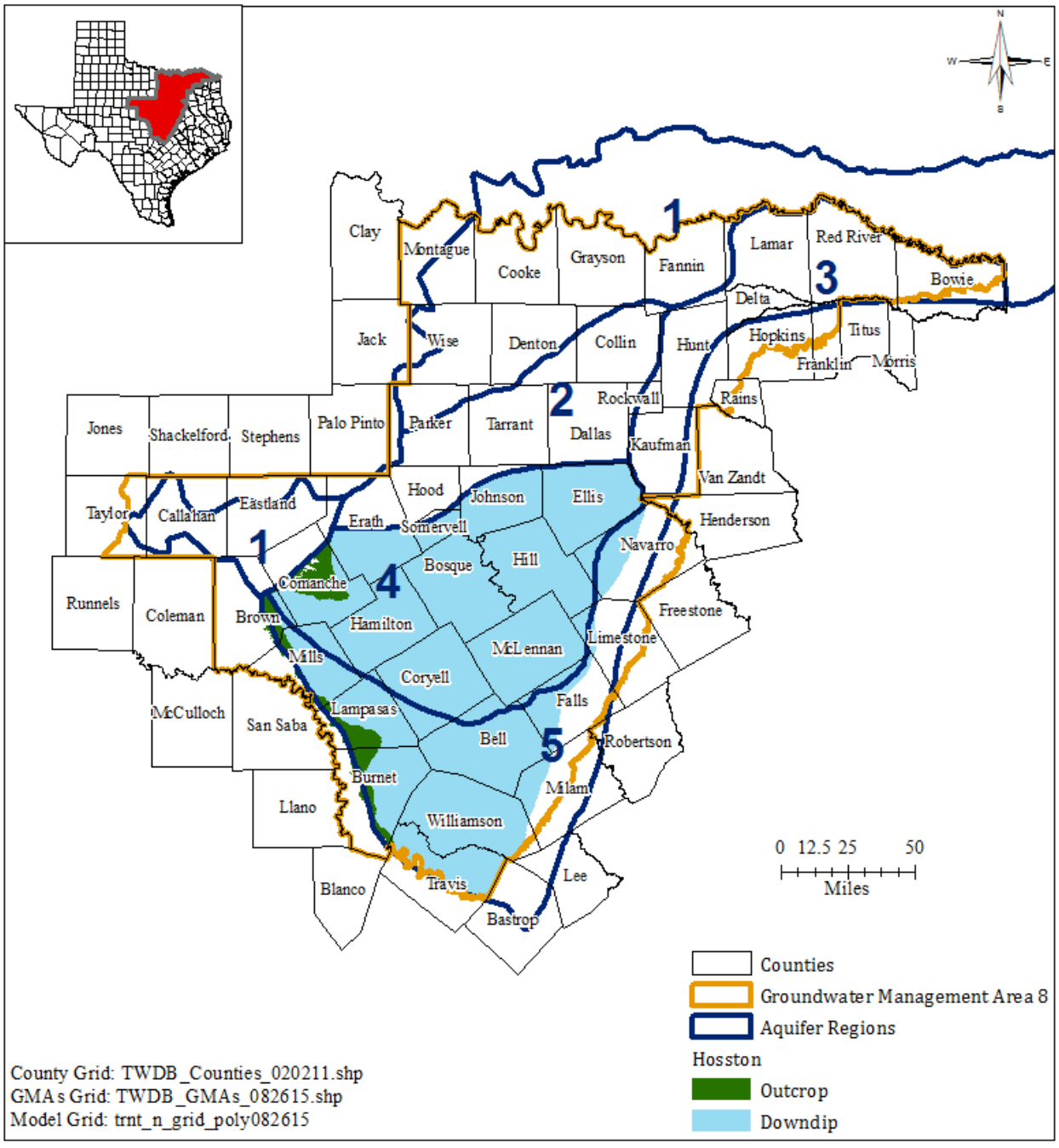

FIGURE 6. MAP SHOWING THE TRINITY AQUIFER (HOSSTON) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS.

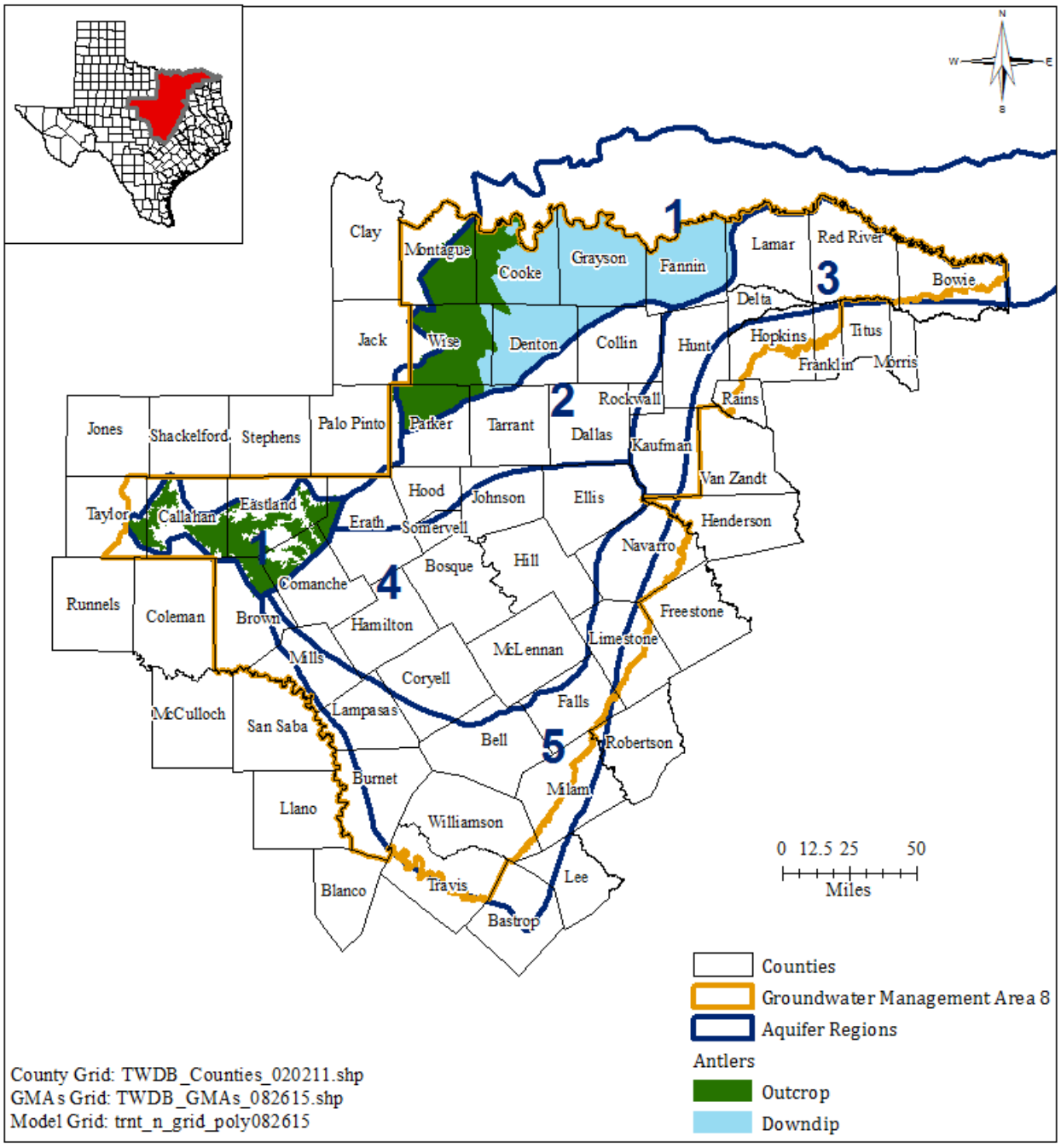

FIGURE 7. MAP SHOWING THE TRINITY AQUIFER (ANTLERS) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS.

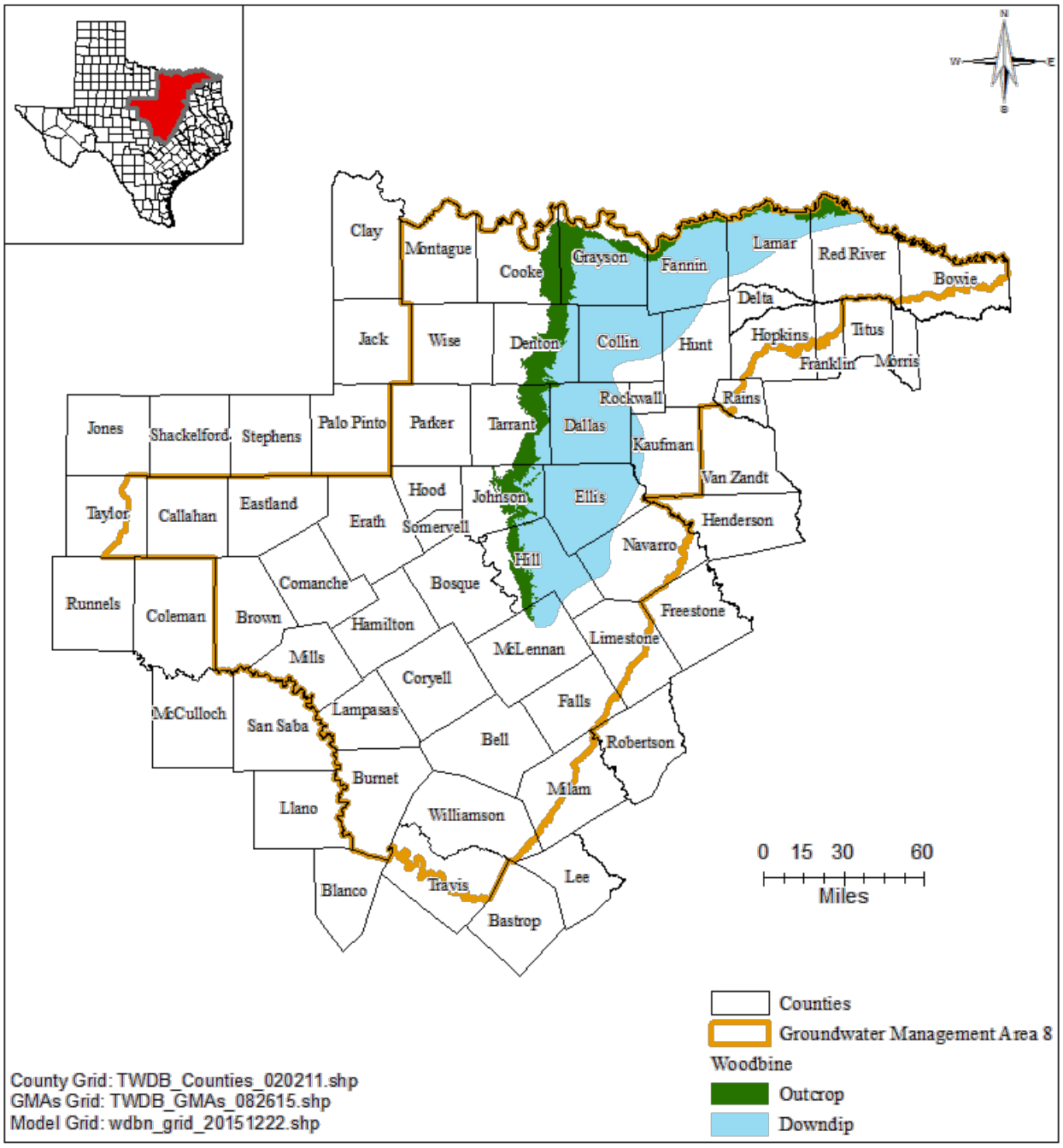

FIGURE 8. MAP SHOWING THE WOODBINE AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS.

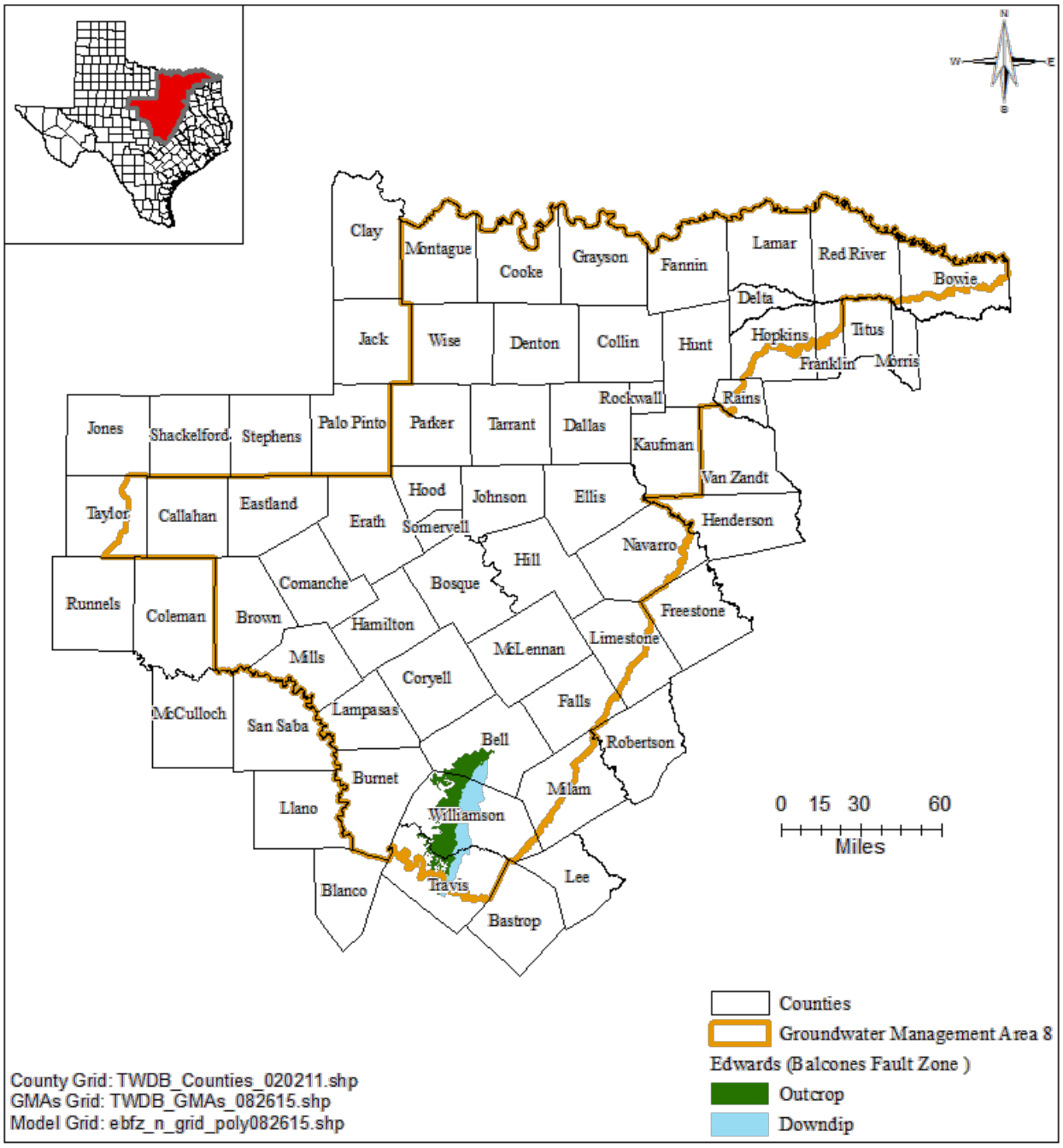

FIGURE 9. MAP SHOWING THE EDWARDS (BALCONES FAULT ZONE) AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN SEGMENT OF THE EDWARDS (BALCONES FAULT ZONE) AQUIFER.

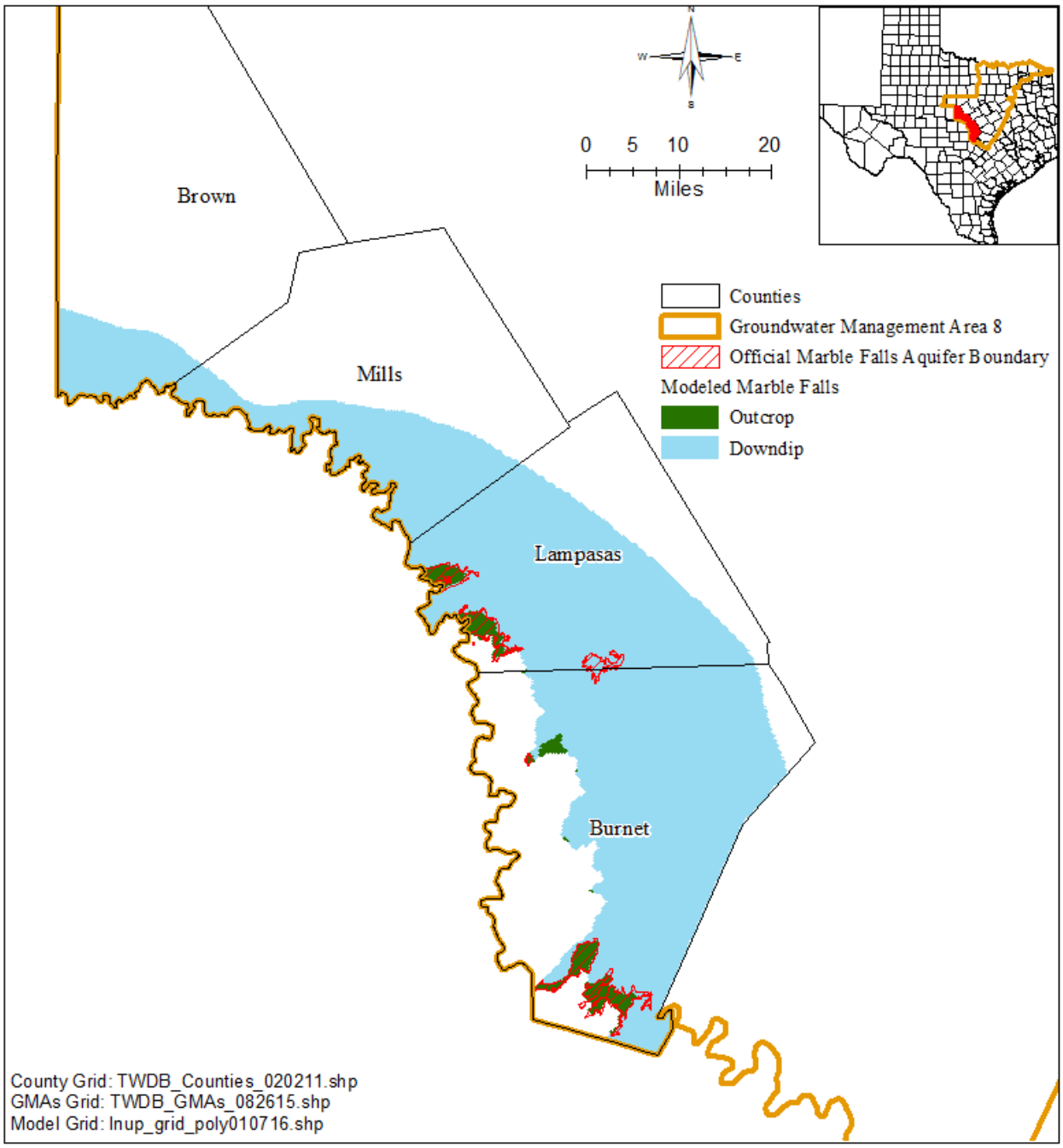

FIGURE 10. MAP SHOWING THE MARBLE FALLS AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE MINOR AQUIFERS IN LLANO UPLIFT REGION.

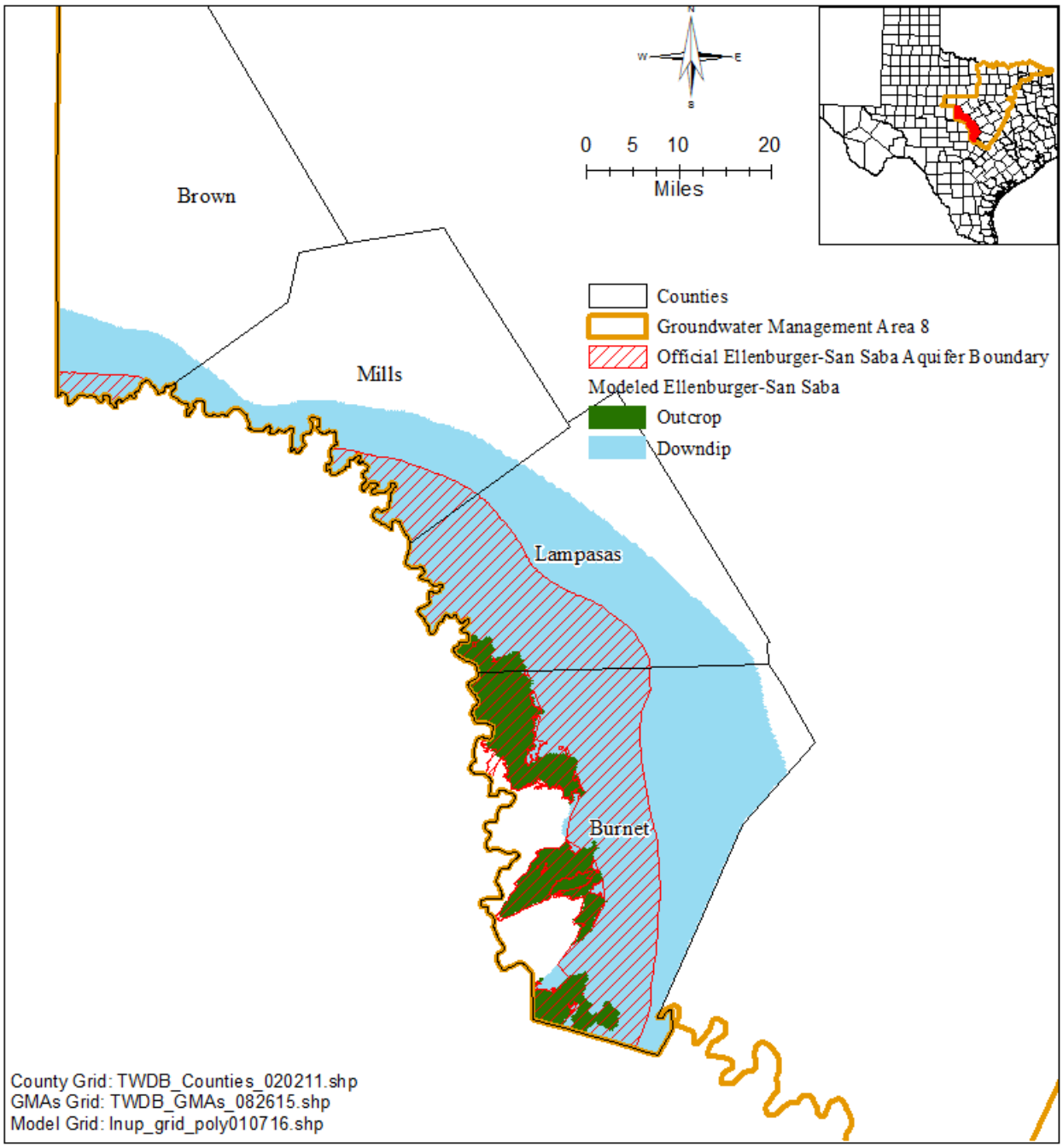

FIGURE 11. MAP SHOWING THE ELLENBURGER-SAN SABA AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE MINOR AQUIFERS IN LLANO UPLIFT REGION.

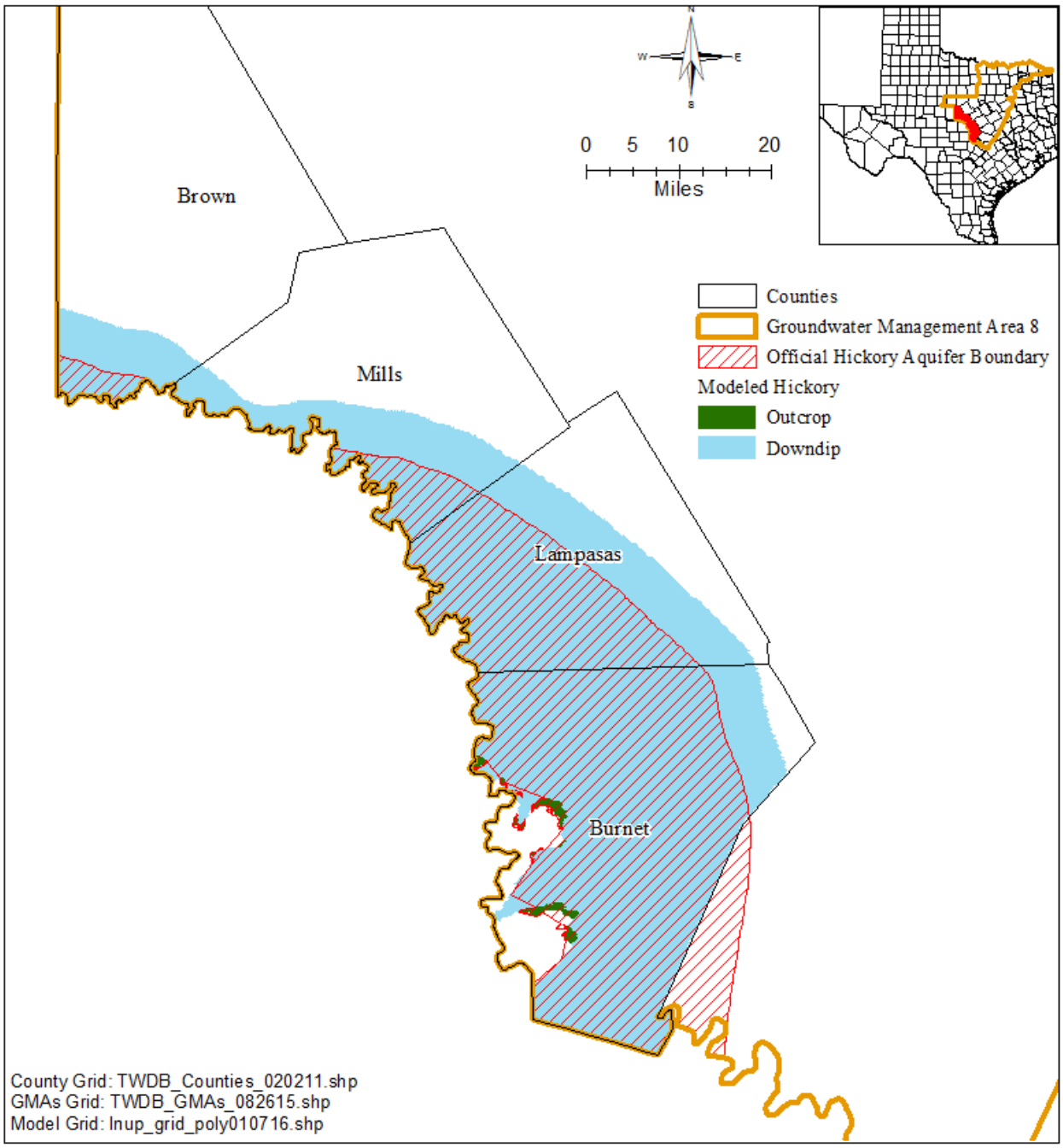

FIGURE 12. MAP SHOWING THE HICKORY AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE MINOR AQUIFERS IN LLANO UPLIFT REGION.

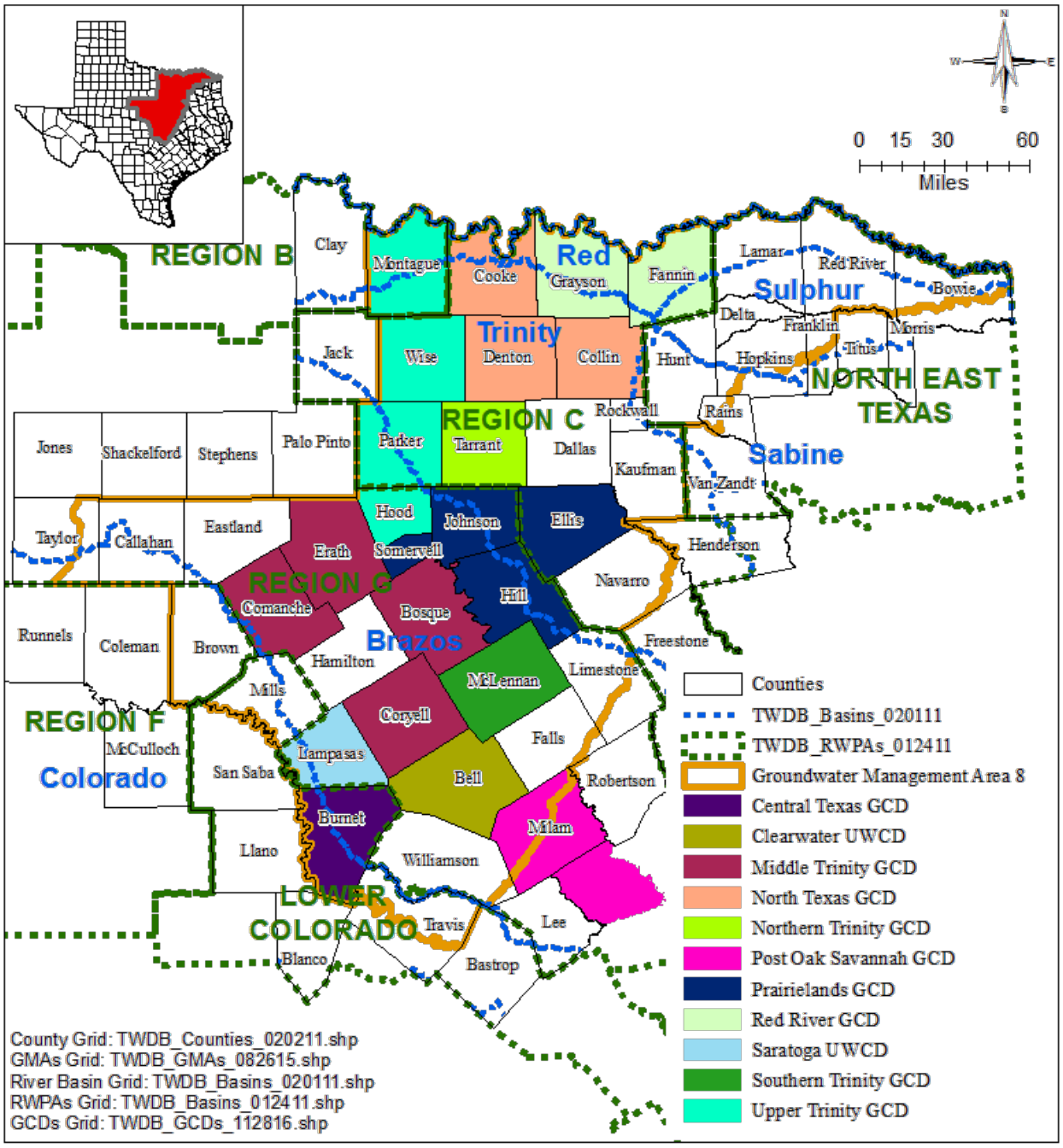

FIGURE 13. MAP SHOWING REGIONAL WATER PLANNING AREAS (RWPAS), GROUNDWATER CONSERVATION DISTRICTS (GCDS), AND RIVER BASINS ASSOCIATED WITH GROUNDWATER MANAGEMENT AREA 8.

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

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**

UWCD: Underground Water Conservation District.

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**

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 Management Area 8		**12,000**	**12,701**	**12,736**	**12,701**	**12,736**	**12,701**	**12,736**	**12,701**

UWCD: Underground Water Conservation District.

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 Management Area 8		**30,484**	**40,827**	**40,939**	**40,827**	**40,939**	**40,827**	**40,939**	**40,827**

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
No District	Williamson	3,026	2,883	2,891	2,883	2,891	2,883	2,891	2,883

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 Management Area 8		**73,962**	**93,757**	**94,016**	**93,757**	**94,016**	**93,757**	**94,016**	**93,757**

UWCD: Underground Water Conservation District.

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 Management Area 8		**19,152**	**27,257**	**27,331**	**27,257**	**27,331**	**27,257**	**27,331**	**27,257**

UWCD: Underground Water Conservation District.

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 Management Area 8		**53,357**	**64,922**	**65,098**	**64,922**	**65,098**	**64,922**	**65,098**	**64,922**

UWCD: Underground Water Conservation District.

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 Management Area 8		**62,634**	**74,471**	**74,677**	**74,471**	**74,677**	**74,471**	**74,677**	**74,471**

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 Management Area 8		**30,719**	**30,554**	**30,636**	**30,554**	**30,636**	**30,554**	**30,636**	**30,554**

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
Groundwater Management Area 8		**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**

UWCD: Underground Water Conservation District.

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 Total		**1**	**630**	**631**	**630**	**631**	**630**	**631**	**630**
Groundwater Management Area 8		**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 District Total		**0**	**48**	**48**	**48**	**48**	**48**	**48**	**48**
Groundwater Management Area 8		**1,088**	**3,574**	**3,585**	**3,574**	**3,585**	**3,574**	**3,585**	**3,574**

UWCD: Underground Water Conservation District.

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
Counties Not in Upper Trinity 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

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**
Counties in Upper 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			**2,823**	**2,815**	**2,823**	**2,815**	**2,823**	**2,815**
Groundwater Management Area 8			**24,565**	**24,498**	**24,565**	**24,498**	**24,565**	**24,498**

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
Counties Not in Upper Trinity 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

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**
Counties in Upper 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**
Groundwater Management Area 8			**12,735**	**12,699**	**12,735**	**12,699**	**12,735**	**12,699**

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
Counties Not in Upper Trinity 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**
Counties in Upper 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**
Groundwater Management Area 8			**40,939**	**40,827**	**40,939**	**40,827**	**40,939**	**40,827**

TABLE 16. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (TRAVIS PEAK) 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
Counties Not in Upper Trinity 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

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**
Counties in Upper Trinity GCD								
Hood (downdip)	Region G	Brazos	89	89	89	89	89	89
Subtotal			**89**	**89**	**89**	**89**	**89**	**89**
Groundwater Management Area 8			**94,015**	**93,755**	**94,015**	**93,755**	**94,015**	**93,755**

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
Counties Not in Upper Trinity 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

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
Williamson	Lower Colorado	Colorado	0	0	0	0	0	0
Subtotal			**27,296**	**27,223**	**27,296**	**27,223**	**27,296**	**27,223**
Counties in Upper Trinity GCD								
Hood (downdip)	Region G	Brazos	36	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**

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
Counties Not in Upper Trinity 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

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**
Counties in Upper 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**

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
Counties Not in Upper Trinity 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**
Counties in Upper 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

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			**16,551**	**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**

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
Groundwater Management Area 8			**30,634**	**30,553**	**30,634**	**30,553**	**30,634**	**30,553**

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**

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**

LIMITATIONS:

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

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

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

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

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

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Appendix A

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).

<table>
<tr><th>Model Layer</th><th>Region 1</th><th>Region 2</th><th>Region 3</th><th>Region 4</th><th>Region 5</th></tr>
<tr><td>2</td><td colspan="3">Woodbine</td><td>Woodbine (no sand)</td><td></td></tr>
<tr><td>3</td><td colspan="5">Washita/Fredericksburg</td></tr>
<tr><td>4</td><td rowspan="5">Antlers</td><td colspan="3">Paluxy</td><td>Paluxy (no sand)</td></tr>
<tr><td>5</td><td colspan="4">Glen Rose</td></tr>
<tr><td>6</td><td rowspan="3">Twin Mountains</td><td rowspan="3">Travis Peak</td><td>Hensell</td><td rowspan="3">Travis Peak</td><td>Hensell</td></tr>
<tr><td>7</td><td>Pearsall/Sligo</td><td>Pearsall/Sligo</td></tr>
<tr><td>8</td><td>Hosston</td><td>Hosston</td></tr>
</table>

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:

Hc = Composite Head (feet above mean sea level)

T_i = Transmissivity of model layer i (square feet per day)

H_i = Head of model layer i (feet above mean sea level)

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:

Hc_County = Average composite head for a county (feet above mean sea level)

Hc_i = Composite Head at a lateral location as defined in last step (feet above mean sea level)

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.

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 A1 and A2) and performed the comparison against the corresponding desired future conditions by county (Tables A3, A4, A5, and A6). The review by the TWDB indicates that the predictive simulation meets the desired future conditions (Tables A7 and A8).

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

County	Woodbine	Paluxy	Glen Rose	Twin Mountains	Travis Peak	Hensell	Hosston	Antlers
Taylor	—	—	—	—	—	—	—	0
Travis	—	—	85	—	142	51	148	—
Williamson	—	—	76	—	172	73	176	—

—: Not available.

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)	—	—	—	18
Montague (downdip)	—	—	—	—
Parker (outcrop)	5	10	1	11
Parker (downdip)	1	28	46	—
Wise (outcrop)	—	—	—	35
Wise (downdip)	—	—	—	142

—: Not available.

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%	—	—	—	—

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%	—

—: Not available.

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%

—: Not available.

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	—	—	—	—

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	—

—: Not available.

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

—: Not available.

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 Rose	Twin Mountains	Travis Peak	Hensell	Hosston	Antlers
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	—

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	—

—: Not available.

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

—: Not available.

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:

$$ST = \frac{\sum_{i=1}^{n}\left(h2070_i - e_i\right)}{\sum_{i=1}^{n}\left(h2009_i - e_i\right)}$$

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.

The comparison between the simulated remaining saturated thickness and the desired future conditions is presented in Table B2. Table B2 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.

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

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

Appendix C

Summary of Dry Model Cell Count for the Trinity and Woodbine Aquifers

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

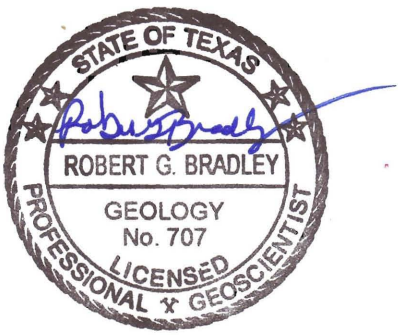
TABLE D1. SUMMARY OF DRY MODEL CELLS FOR THE MARBLE FALLS, ELLENBURGER-SAN SABA, AND HICKORY AQUIFERS IN BROWN, BURNET, LAMPASAS, AND MILLS COUNTIES FROM THE PREDICTIVE SIMULATION.

Year	Burnet	Lampasas	Burnet	Burnet
	Marble 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

Year	Burnet	Lampasas	Burnet	Burnet
	Marble 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

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

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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 82nd 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.

County	Regional Water Planning Area	River Basin	Year					
			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	Year					
	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 Planning Area	Year					
	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	Year					
	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 Conservation District	Year					
	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.

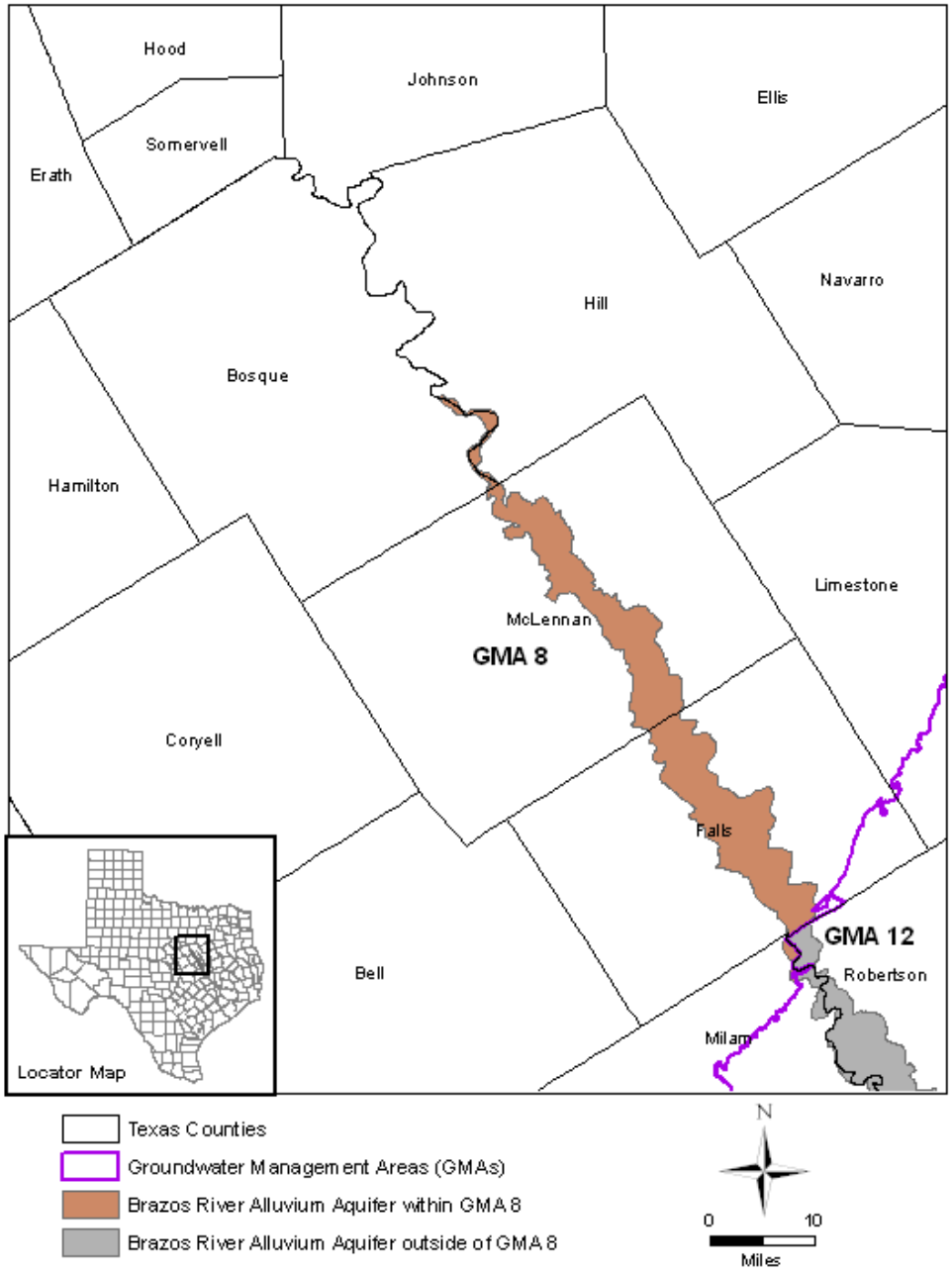


Figure 1. Map showing the area covered by the Brazos River Alluvium Aquifer in Groundwater Management Area 8.

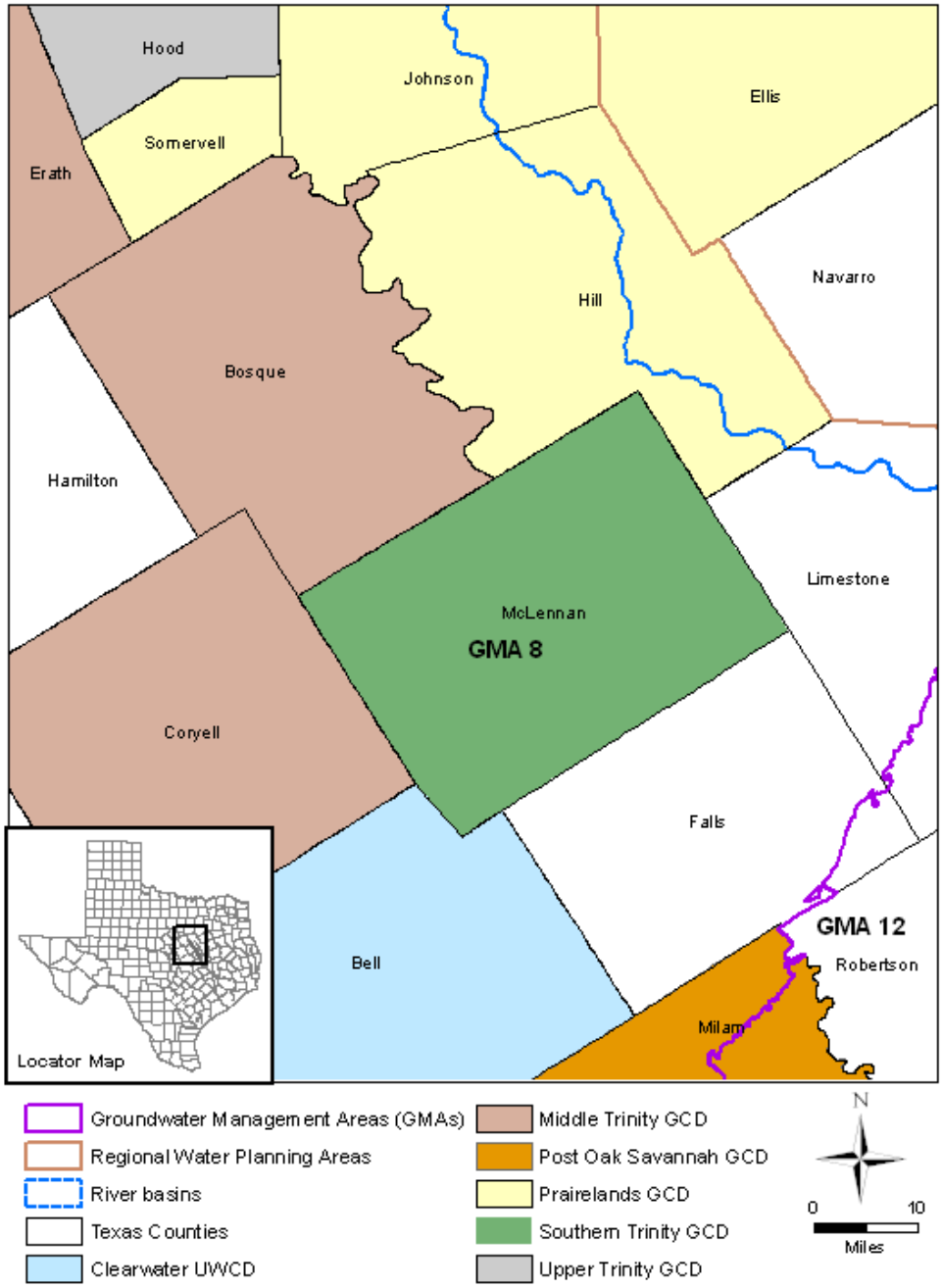


Figure 2. Map showing regional water planning areas, river basins, groundwater conservation districts and counties in and neighboring the Groundwater Management Area 8 assessment area. GCD = Groundwater Conservation District, UWCD = Underground Water Conservation District.

Mon 7/19/2021 7:22 AM

stgcd@stgcd.org

STGCD 2021 Management Plan

To City of Crawford; City of Mart; David Collinsworth; Greg Hobbs; Lisa Tyler

Cc Al Blair

STGCD_MP_2021_07_15_Final.pdf 755 KB

STGCD_MP_Appendices_2020.zip 15 MB

Surface Water Providers in McLennan County,

Please find attached Southern Trinity Groundwater Conservation District's Management Plan.

Should you have any questions, please do not hesitate to contact the District office at 254.759.5610 or email stgcd@stgcd.org

Scooter Radcliffe

Southern Trinity Groundwater Conservation District

List of surface water entities contacted via email by Scooter Radcliffe on July 19, 2021. This email transmitted to them the newly adopted (July 15, 2021) Southern Trinity GCD groundwater management plan

- City of Crawford
- City of Mart
- City of Waco- Lisa Tyler
- City of Robinson- Greg Hobbs
- Brazos River Authority- David Collinsworth

STGCD Annual Groundwater Production Estimates by Aquifer and Aquifer Formation										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft
Brazos River Alluvium	100	100	100	100	100	89	89	137	237	422
Leakage from Glen Rose (Hensell Wells)	265	265	265	265	265	265	265	265	265	265
Trinity Hensell (21% of Trinity Total)	3,401	3,467	3,067	2,857	2,535	2,726	2,829	2,639	2,576	2,726
Trinity Hosston (79% of Trinity Total)	12,819	13,047	11,678	10,955	9,856	10,255	10,643	9,930	9,692	10,253
Trinity Total	16,219	16,514	14,745	13,812	12,391	12,981	13,472	12,569	12,268	12,979
Woodbine	-	-	-	-	-	-	-	-	-	-
Other	55	56	50	50	50	50	50	50	50	50
Total All Managed Aquifers (Trinity + Alluvium)	16,319	16,614	14,845	13,912	12,491	13,070	13,561	12,706	12,505	13,401

Texas Water Development Board

2017 DRAFT Irrigation Water Use Estimates

Southern Trinity Groundwater Conservation District

MCLENNAN COUNTY

**Note, these DRAFT estimates are for 2017!*

Crop Number	Crop Name	Draft Acres	Draft Inches per Acre	Draft Acre-Feet
1	COTTON	1,370	15	1,713
2	SORGHUM	0		0
3	CORN	1,430	14	1,668
4	RICE	0		0
5	WHEAT	0		0
6	OTHER_GRAIN	140	12	140
7	FORAGE_HAY_PASTURE	340	14	397
8	PEANUTS	0		0
9	SOY_OIL	590	16	787
10	VINEYARD	10	14	12
11	ORCHARD	200	19	317
12	ALFALFA	0		0
13	SUGARCANE	0		0
14	VEGETABLES	0		0
15	OTHER	0		0
16	GOLF_COURSES	0		0
17	FAILED	0		0
	County Total	4,080		5,034

Estimated county-wide average irrigation application efficiency percentage: **65%**

Groundwater (Acre-Feet):	1,747
Surface Water (Acre-Feet):	3,287
Waste-Water Reuse (Acre-Feet):	0

Please review the Draft 2017 irrigation water use estimates and irrigation application efficiency estimate then provide any necessary revisions via email to Agconservation@twdb.texas.gov, or mail to Texas Water Development Board, Attention: Ag Conservation, 1700 North Congress Avenue, P.O. Box 13231, Austin, TX 78711-3231. Please direct calls to Antonio Delgado (512) 463-7984 or Cameron Turner (512) 936-6090.

Texas Water Development Board

2018 DRAFT Irrigation Water Use Estimates

Southern Trinity Groundwater Conservation District

MCLENNAN COUNTY

**Note, these DRAFT estimates are for 2018!*

Crop Number	Crop Name	Draft Acres	Draft Inches per Acre	Draft Acre-Feet
1	COTTON	1,360	15	1,700
2	SORGHUM	0		0
3	CORN	1,920	14	2,240
4	RICE	0		0
5	WHEAT	0		0
6	OTHER_GRAIN	140	13	152
7	FORAGE_HAY_PASTURE	400	14	467
8	PEANUTS	0		0
9	SOY_OIL	120	16	160
10	VINEYARD	10	14	12
11	ORCHARD	200	19	317
12	ALFALFA	0		0
13	SUGARCANE	0		0
14	VEGETABLES	10	20	17
15	OTHER	1,200	29	2,900
16	GOLF_COURSES	0		0
17	FAILED	0		0
	County Total	5,360		7,965

Estimated county-wide average irrigation application efficiency percentage: **65%**

Groundwater (Acre-Feet):	1,900
Surface Water (Acre-Feet):	6,065
Waste-Water Reuse (Acre-Feet):	0

Please review the Draft 2018 irrigation water use estimates and irrigation application efficiency estimate then provide any necessary revisions via email to Agconservation@twdb.texas.gov, or mail to Texas Water Development Board, Attention: Ag Conservation, 1700 North Congress Avenue, P.O. Box 13231, Austin, TX 78711-3231. Please direct calls to Antonio Delgado (512) 463-7984 or Cameron Turner (512) 936-6090.

Historical Conservation Efforts

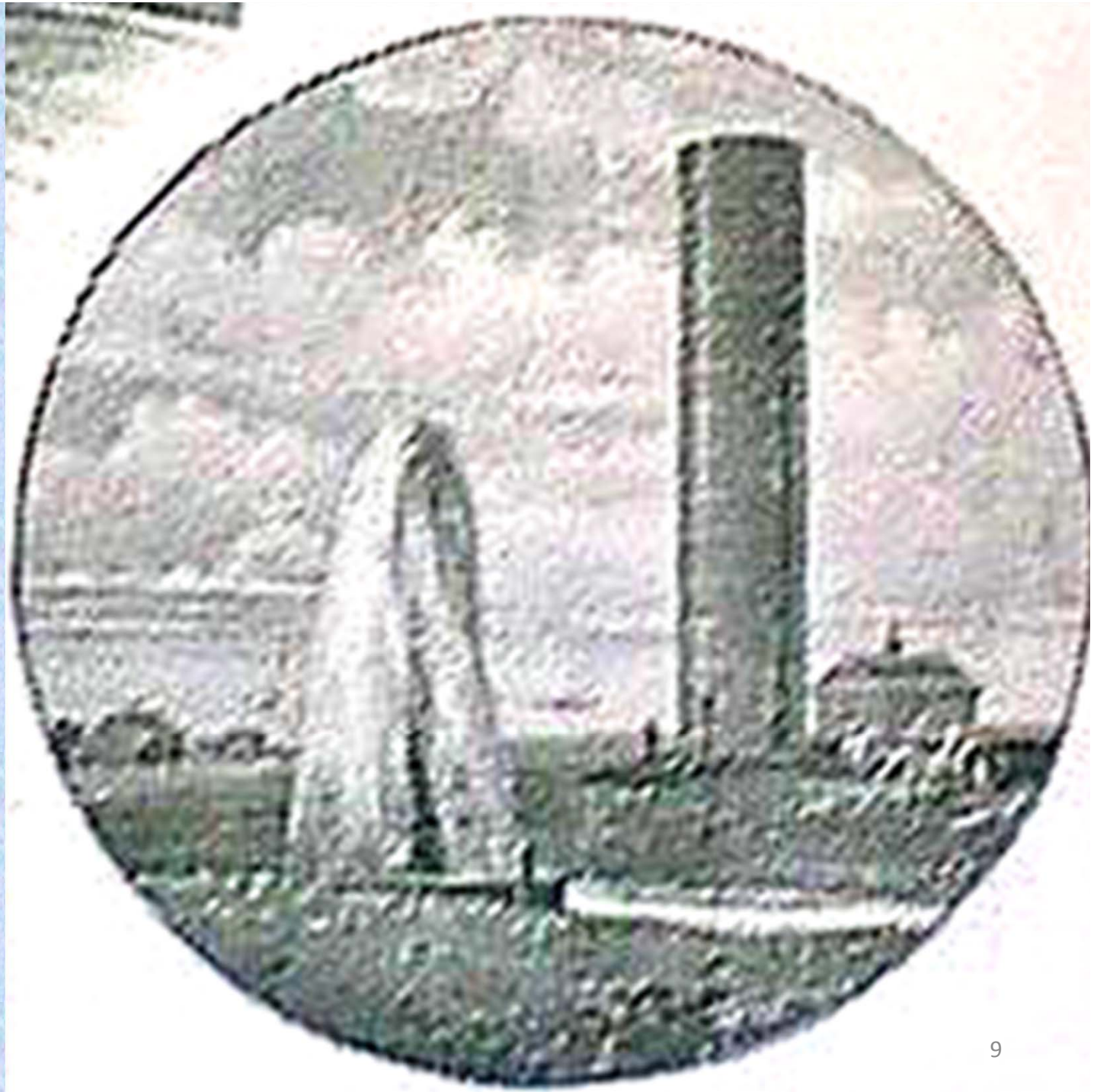
Hill, R.T. et al (1901)

TWENTY-FIRST ANNUAL REPORT OF THE UNITED STATES GEOLOGICAL SURVEY PART VII-TEXAS GEOGRAPHY AND GEOLOGY OF THE BLACK AND GRAND PRAIRIES, TEXAS

Sundstrom et al (1945)

Public Water Supplies in Eastern Texas Vol. II USGS and Texas State Board of Water Engineers

- 1889: First artesian well in McLennan County
- 1894: Some wells had stopped flowing at the surface

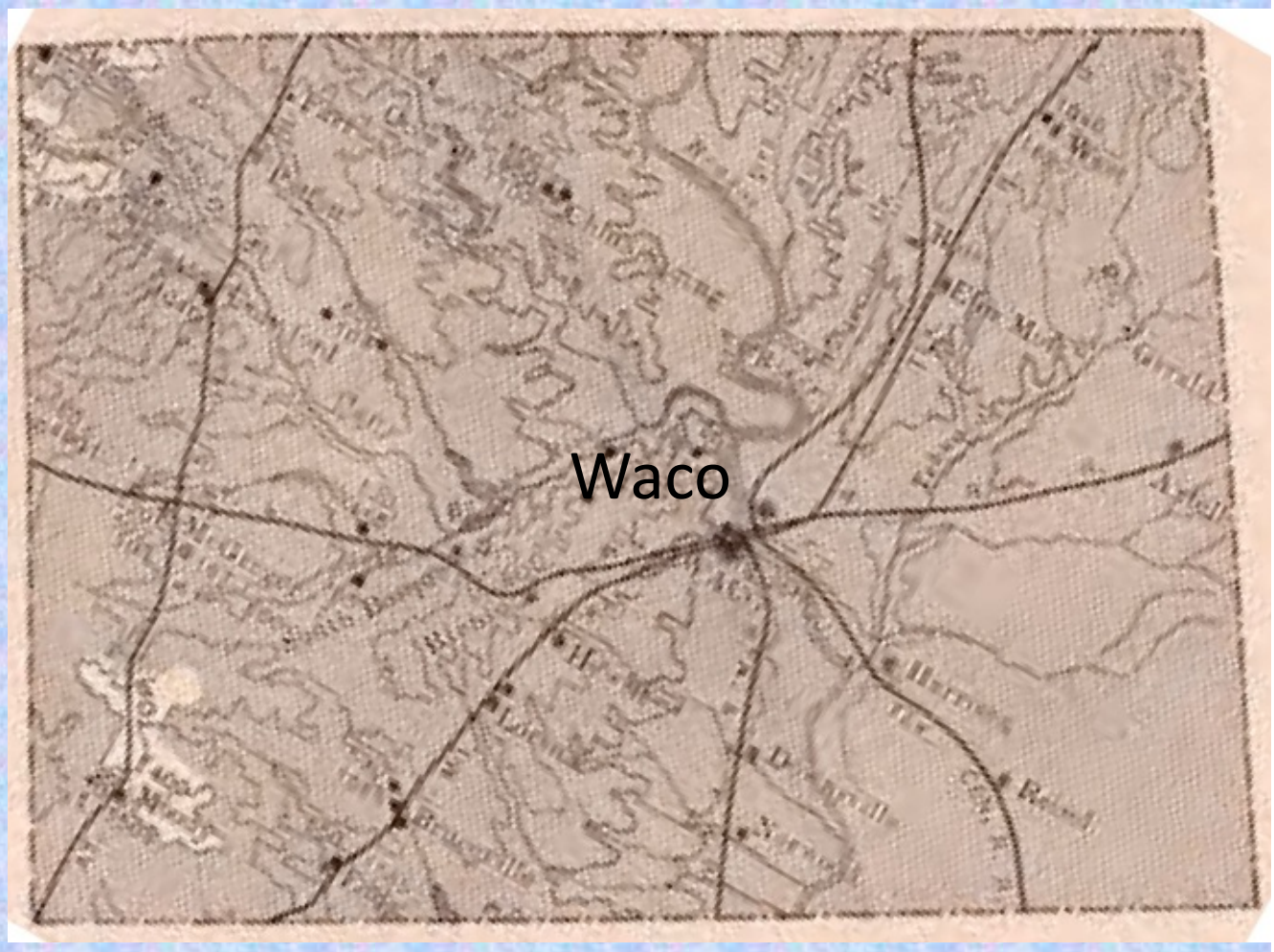


McLennan County Flowing Wells 1897

Approximately
27 Wells

Large Variation
in Flow Rate
5 to 1,000 gpm

Peak Annual
Discharge of
10,000 to
20,000 AF



1891 Waco Area Flowing Wells (Hill, 1901)

12 Wells - Total of 7,222 GPM or 11,650 AF/YR

Name of well.	Altitude.	Diameter.	Depth.	Flow per diem.	Temperature.	Initial pressure
	Feet.	*Inches.*	*Feet.*	*Gallons.*	° *F.*	*Pounds.*
The Moore well	493	6	1,840	600,000	103	*a* 60
The Bell well *b*	500	6	1,820	500,000	102½	*a* 60
Jumbo well No. 1 *b*	500	8	1,848	1,200,000	103	*c* 60
Jumbo well No. 2 *b*	500	8	1,860	1,000,000	103	60
The Glenwood	495	8	1,860	1,000,000	103	*a* 65
The Dickey well	532	8	1,840	1,000,000	103	*a* 60
The Bagby well	475	8	1,845	1,000,000	103	*a* 60
The Waco Light and Water Power Co. well	532	6	1,812	300,000	100	40
The Prather well	655	6	1,607	500,000	97	*c* 40
The Kellum well	420	6	1,776	1,000,000	103	*c* 76
The Padgett well (Fishing Club)	485	6	1,866	1,000,000	90	*c* 72
The W. V. Fort well	425	.....	1,825	1,300,000	.....	.....

a Estimated. *b* These three, the Bell, Jumbo No. 1 and No. 2, are 50 feet equidistant. *c* Tested.

Black and Grande Prairie Flowing Wells

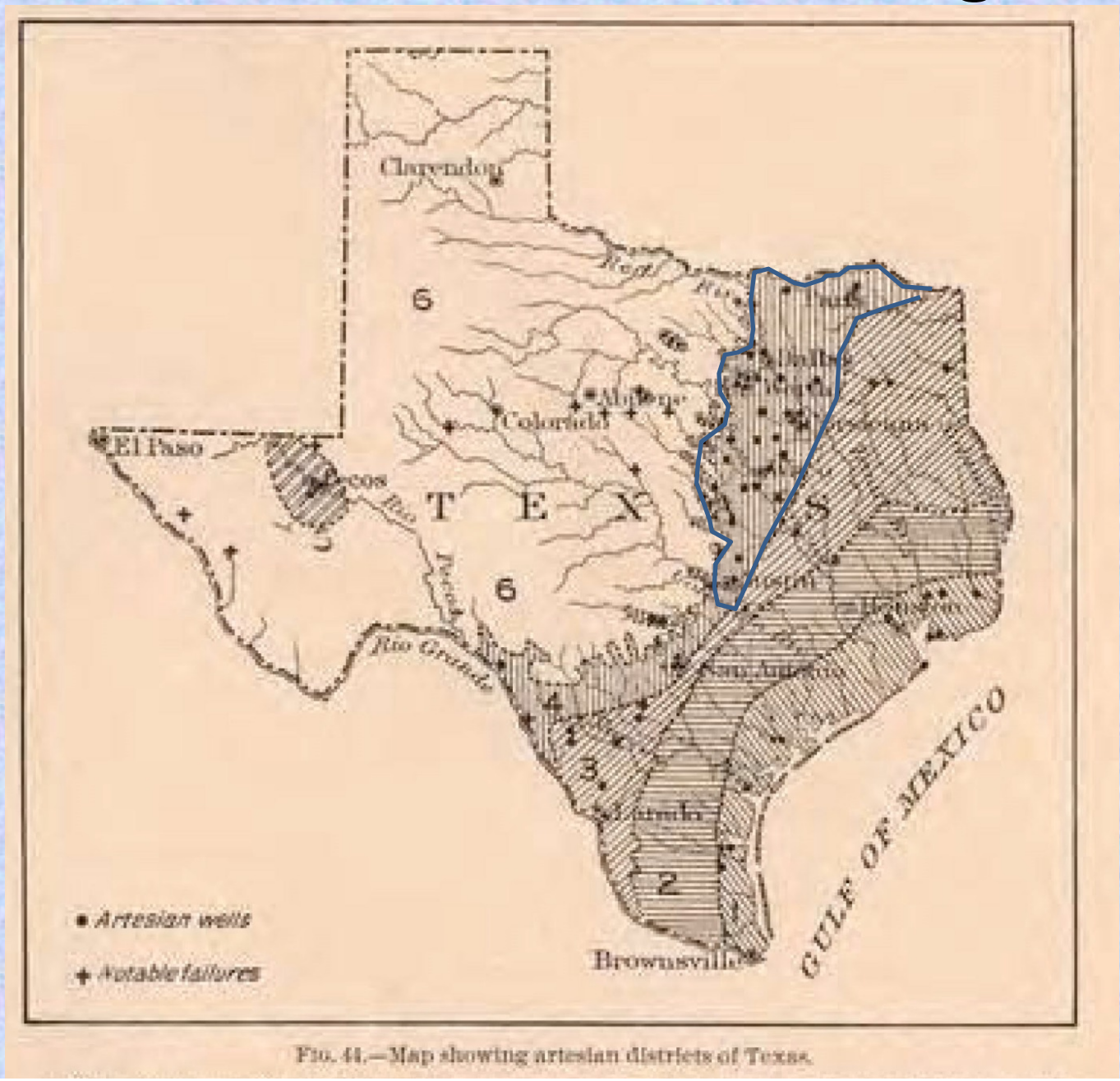
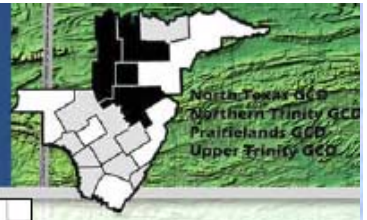
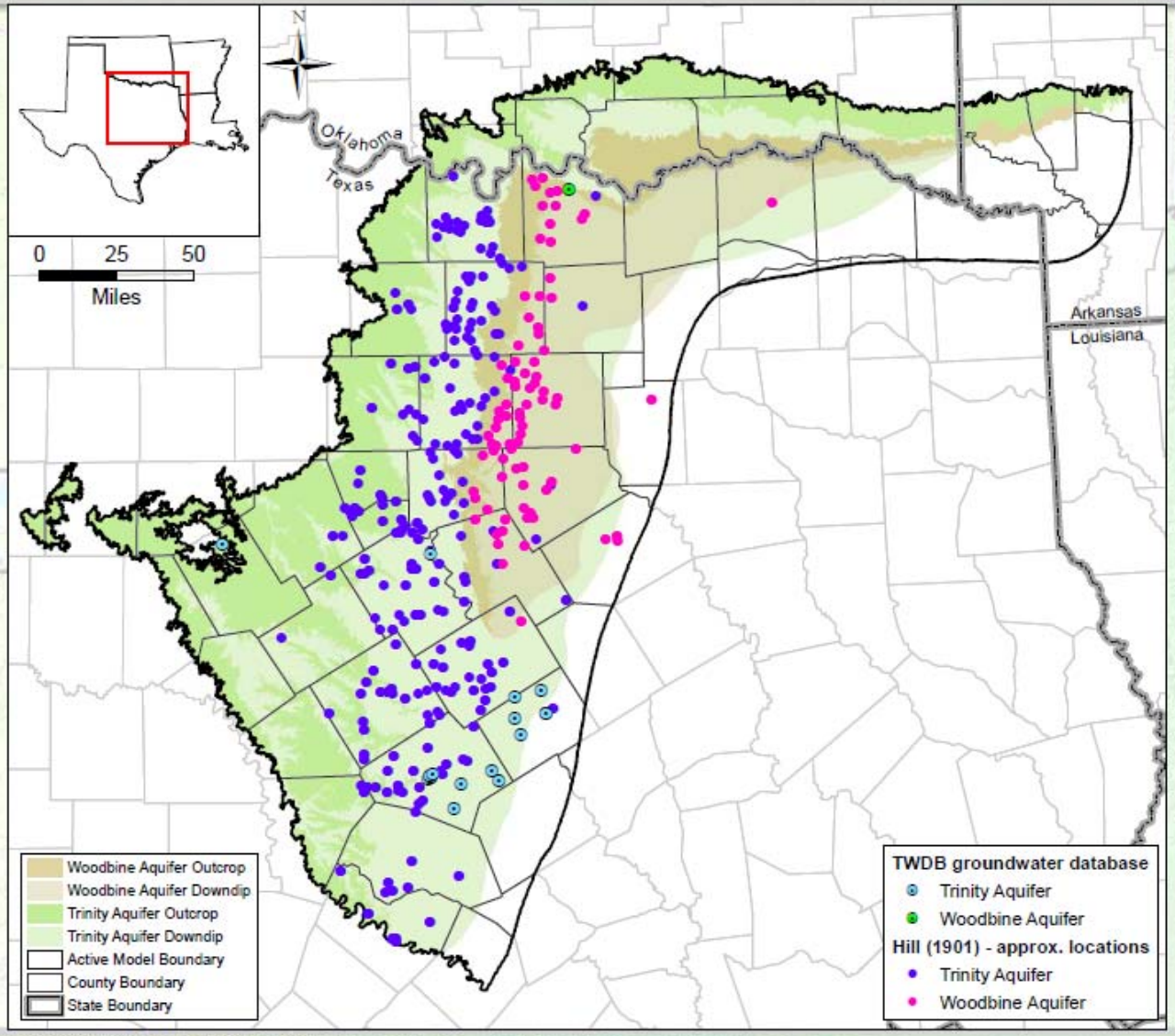


FIG. 44.—Map showing artesian districts of Texas.

Flowing Wells

Trinity and Woodbine Aquifers





Mullican & Associates

458 Flowing Wells in 1897 (Hill, 1901) Black and Grand Prairies

List of flowing and nonflowing artesian wells reported from the various counties of the Black and Grand prairie regions of Texas in 1897.

County.	Flowing.	Nonflowing.	County.	Flowing.	Nonflowing.
Bell	41	5	Jack	4	12
Bosque	44	32	Johnson	10	29
Brown	----	12	Kaufman	0	8
Burnet	3	12	Lamar	0	2
Collin	1	9	Lampasas	0	7
Comanche	1	16	McLennan	27	8
Cooke	10	32	Milam	2	2
Coryell	24	27	Mills	0	10
Dallas	60	17	Navarro	3	----
Denton	43	*a* 30	Parker	12	16
Ellis	22	14	Red River	0	2
Erath	2	25	Somervell	80	0
Falls	1	----	Tarrant	*b* 25	*a* 75
Fannin	----	*b* 6	Travis	9	11
Grayson	10	16	Williamson	7	13
Hamilton	2	20	Wise	1	12
Hill	5	14	Total	458	506
Hood	8	12			
Hunt	1	----			

a Or more. *b* About.

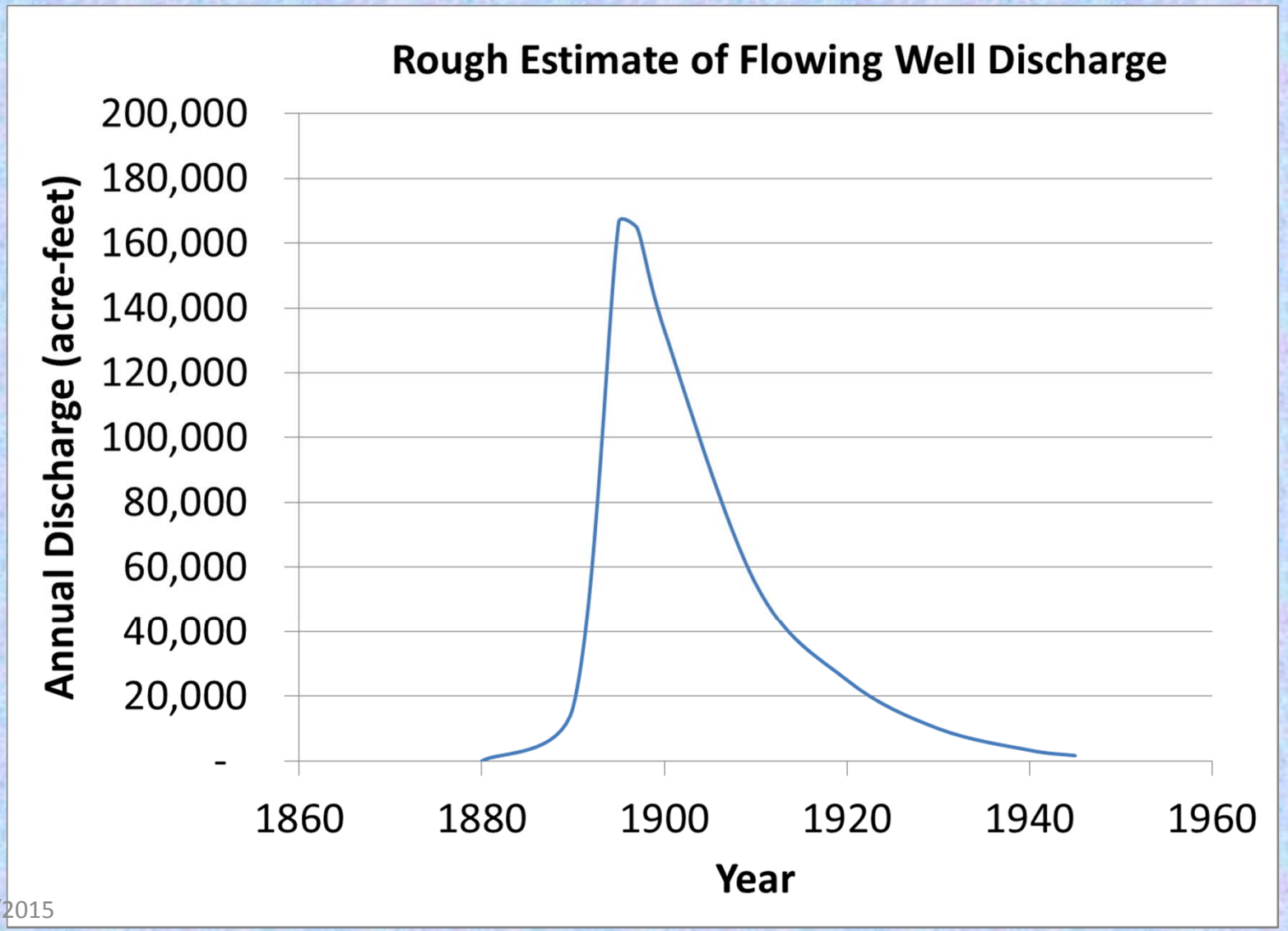
Rough Estimate of Annual Volume Discharged in 1897 Black and Grande Prairie Area

- 458 Flowing Wells in 1897
- Waco 12 Wells - Total of 11,650 AF/YR
- Hill (1901) county-by-county descriptions show there were approximately 25 large production wells (600 to 1,000 gpm)
- Assume a statistical distribution (log-normal) with skewed towards small production wells (also evaluated normal and uniform distributions)

Rough Estimate Annual Volume Discharged in 1897 Black and Grande Prairie Area

Avg GPM	# Wells	GPM
5	90.0	450
50	123.0	6,150
100	90.0	9,000
200	80.0	16,000
400	50.0	20,000
800	25.0	51,600
Totals	458	103,200
Annual Acre-Feet =		**166,462**

Rough Estimate of Flowing Well Discharge (2.9 Million Acre-Feet)



Public Water Supplies Vol. II by Sundstrom (USGS 1945)

Waco

Population in 1940: 55,982.

Ownership: Municipal.

Source of information:
George J. Roban, Water Superintendent
January 8, 1943

Source of supply: Lake Waco on Bosque River, capacity 39,000 acre-feet when built about 1930; (the city still uses a few water wells for display fountains and special industrial requirements. It was reported that the estimated natural flow of water from 12 wells in Waco was more than 10 million gallons a day in 1891 with pressure as high as 76 pounds, enough to raise the water 175 feet above the land surface. Because of these wells, Waco has been called the "Geyser City." Some of the wells in the lower part of town still have a flow. The yield diminished considerably, but the yield and pressure have recovered somewhat since the city started to use surface water.)

15 Municipal Surface Water Users in STGCD

Table 3.1-1 (Continued)

Wholesale Water Supplier Contracts	Year					
	2010	2020	2030	2040	2050	2060
Bluebonnet WSC						
City of Bruceville-Eddy	827	964	1,081	1,200	1,275	1,389
Elm Creek WSC	420	502	571	632	671	723
City of McGregor	933	923	913	902	894	899
City of Moody	202	203	203	204	206	212
Spring Valley WSC (McLennan C-O)	250	298	331	336	331	331
City of Woodway	110	110	110	110	110	110
Waco						
City of Waco	24,876	26,453	27,781	29,159	30,033	31,304
City of Bellmead	2,622	2,751	2,873	2,984	3,065	3,202
City of Hewitt	2,029	2,237	2,395	2,571	2,684	2,877
City of Lacy-Lakeview	1,120	1,120	1,120	1,120	1,120	1,120
City of Woodway	2,944	2,925	2,903	2,882	2,867	2,874
City of Beverly Hills	414	416	416	414	416	424
City of West	1,120	1,120	1,120	1,120	1,120	1,120
Bold Springs Water Supply (McLennan C-O)	560	560	560	560	560	560
Hilltop Water Supply (McLennan C-O)	97	97	97	97	97	97
McLennan County Manufacturing	2,503	2,888	3,249	3,618	3,948	4,403

Surface Water Use in STGCD

1974-2004 TWDB Data (19 years of data)

Averages 78% of Surface Water Use

47,135 AF/YR of Surface Water

2000

Averages 79% of Surface Water Use

59,090 AF/YR of Surface Water

2012

Averages 76% of Surface Water Use

47,342 AF/YR of Surface Water

Current and Historical Groundwater Users

- 48 Municipal and Rural Water Supply Entities
- Governmental Contractors
  - US Naval Weapons Industrial Reserve Plant – SPACE-X – Rocket Engine Test Facility
  - US Connally Air Force Base – TSTC and L3
- Industrial
  - Cargill – Processing Facility
  - Sanderson Farms – Processing Facility
  - Sandy Creek Power Plant (treated effluent)

Per Capita Use of Groundwater in Southern Trinity GCD

- 2000
  Trinity Groundwater Use of 15,677 AF
  Population 213,557
  Per Capita Use of 65.5 gallons per day
- 2012
  Trinity Groundwater Use of 15,399 AF
  Population of 238,702
  Per Capita Use of 57.3 gallons per day
  0.02 acre-feet per acre per year

- **13% per capita reduction between 2000 & 2012**

Estimated Historical Water Use And 2017 State Water Plan Datasets:

Southern Trinity Groundwater Conservation District

by Stephen Allen
Texas Water Development Board
Groundwater Division
Groundwater Technical Assistance Section
stephen.allen@twdb.texas.gov
(512) 463-7317
January 3, 2021

GROUNDWATER MANAGEMENT PLAN DATA:

This package of water data reports (part 1 of a 2-part package of information) is being provided to groundwater conservation districts to help them meet the requirements for approval of their five-year groundwater management plan. Each report in the package addresses a specific numbered requirement in the Texas Water Development Board's groundwater management plan checklist. The checklist can be viewed and downloaded from this web address:

http://www.twdb.texas.gov/groundwater/docs/GCD/GMPChecklist0113.pdf

The five reports included in this part are:

1. Estimated Historical Water Use (checklist item 2)

   from the TWDB Historical Water Use Survey (WUS)
2. Projected Surface Water Supplies (checklist item 6)
3. Projected Water Demands (checklist item 7)
4. Projected Water Supply Needs (checklist item 8)
5. Projected Water Management Strategies (checklist item 9)

   from the 2017 Texas State Water Plan (SWP)

Part 2 of the 2-part package is the groundwater availability model (GAM) report for the District (checklist items 3 through 5). The District should have received, or will receive, this report from the Groundwater Availability Modeling Section. Questions about the GAM can be directed to Dr. Shirley Wade, shirley.wade@twdb.texas.gov, (512) 936-0883.

DISCLAIMER:

The data presented in this report represents the most up-to-date WUS and 2017 SWP data available as of 1/3/2021. Although it does not happen frequently, either of these datasets are subject to change pending the availability of more accurate WUS data or an amendment to the 2017 SWP. District personnel must review these datasets and correct any discrepancies in order to ensure approval of their groundwater management plan.

The WUS dataset can be verified at this web address:

http://www.twdb.texas.gov/waterplanning/waterusesurvey/estimates/

The 2017 SWP dataset can be verified by contacting Sabrina Anderson (sabrina.anderson@twdb.texas.gov or 512-936-0886).

For additional questions regarding this data, please contact Stephen Allen (stephen.allen@twdb.texas.gov or 512-463-7317).

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

Groundwater and surface water historical use estimates are currently unavailable for calendar year 2019. TWDB staff anticipates the calculation and posting of these estimates at a later date.

MCLENNAN COUNTY

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2018	GW	10,883	1,252	0	3	2,147	277	14,562
	SW	35,881	2,658	2	0	6,065	1,570	46,176
2017	GW	12,503	1,340	0	2	1,747	269	15,861
	SW	35,766	2,711	1	0	3,287	1,527	43,292
2016	GW	12,098	1,657	0	2	1,073	288	15,118
	SW	38,396	2,149	0	0	3,214	1,630	45,389
2015	GW	11,818	1,711	0	0	1,697	279	15,505
	SW	34,188	1,558	0	0	3,204	1,582	40,532
2014	GW	10,698	1,730	0	0	2,095	283	14,806
	SW	35,508	1,518	0	0	3,000	1,604	41,630
2013	GW	12,663	1,716	0	1	148	286	14,814
	SW	35,143	3,075	0	0	3,511	1,621	43,350
2012	GW	14,444	551	0	0	4,500	272	19,767
	SW	35,067	3,147	2	0	684	1,540	40,440
2011	GW	16,874	629	0	0	4,820	314	22,637
	SW	36,811	3,348	3	0	1,933	1,781	43,876
2010	GW	14,608	508	735	98	834	310	17,093
	SW	31,494	1,699	1,373	230	3,287	1,755	39,838
2009	GW	11,801	536	675	125	4,094	284	17,515
	SW	35,247	1,617	1,260	255	2,445	1,611	42,435
2008	GW	12,837	674	615	139	926	271	15,462
	SW	32,772	3,405	1,148	671	3,869	1,535	43,400
2007	GW	11,807	590	0	139	540	303	13,379
	SW	28,957	3,093	393	0	2,519	1,714	36,676
2006	GW	12,977	746	0	178	601	313	14,815
	SW	33,059	3,390	393	610	4,065	1,773	43,290
2005	GW	13,946	458	2	142	1,310	292	16,150
	SW	33,832	3,567	390	0	3,749	1,655	43,193
2004	GW	10,185	526	0	121	2,232	185	13,249
	SW	32,147	3,034	392	223	3,343	1,659	40,798
2003	GW	9,780	940	1	153	645	183	11,702
	SW	44,005	3,528	392	795	2,715	1,644	53,079

Projected Surface Water Supplies
TWDB 2017 State Water Plan Data

MCLENNAN COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
G	BEVERLY HILLS	BRAZOS	WACO LAKE/RESERVOIR	252	261	268	281	297	312
G	BRUCEVILLE-EDDY	BRAZOS	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM	935	930	921	896	884	865
G	CORYELL CITY WATER SUPPLY DISTRICT	BRAZOS	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM	156	181	202	222	243	262
G	COUNTY-OTHER, MCLENNAN	BRAZOS	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM	176	175	172	163	160	153
G	COUNTY-OTHER, MCLENNAN	BRAZOS	WACO LAKE/RESERVOIR	724	724	724	724	724	724
G	CRAWFORD	BRAZOS	CRAWFORD LAKE/RESERVOIR	1	1	1	1	1	1
G	ELM CREEK WSC	BRAZOS	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM	263	258	250	238	231	223
G	HEWITT	BRAZOS	WACO LAKE/RESERVOIR	383	558	877	1,198	1,519	1,833
G	IRRIGATION, MCLENNAN	BRAZOS	BRAZOS RUN-OF-RIVER	1,424	1,406	1,389	1,372	1,354	1,337
G	LACY-LAKEVIEW	BRAZOS	WACO LAKE/RESERVOIR	1,120	1,120	1,120	1,120	1,120	1,120
G	LIVESTOCK, MCLENNAN	BRAZOS	BRAZOS LIVESTOCK LOCAL SUPPLY	1,584	1,584	1,584	1,584	1,584	1,584
G	LORENA	BRAZOS	BRAZOS RIVER AUTHORITY MAIN STEM LAKE/RESERVOIR SYSTEM	0	0	0	0	0	0
G	LORENA	BRAZOS	WACO LAKE/RESERVOIR	140	140	140	140	140	140
G	MANUFACTURING, MCLENNAN	BRAZOS	WACO LAKE/RESERVOIR	2,508	2,893	3,254	3,623	3,953	4,408
G	MCGREGOR	BRAZOS	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM	2,569	2,555	2,531	2,451	2,418	2,365
G	MOODY	BRAZOS	BRAZOS RIVER AUTHORITY LITTLE RIVER	401	399	395	384	379	371

			LAKE/RESERVOIR SYSTEM						
G	RIESEL	BRAZOS	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM	125	125	125	125	125	125
G	ROBINSON	BRAZOS	BRAZOS RUN-OF-RIVER	1,126	1,126	1,126	1,126	1,126	1,126
G	ROBINSON	BRAZOS	WACO LAKE/RESERVOIR	420	420	420	420	420	420
G	STEAM ELECTRIC POWER, MCLENNAN	BRAZOS	LAKE CREEK LAKE/RESERVOIR	9,835	9,830	9,825	9,820	9,815	9,810
G	STEAM ELECTRIC POWER, MCLENNAN	BRAZOS	TURTLE CREEK LAKE/RESERVOIR	4,908	4,906	4,904	4,901	4,899	4,897
G	WACO	BRAZOS	WACO LAKE/RESERVOIR	31,268	28,607	25,850	23,056	20,290	17,407
G	WEST	BRAZOS	WACO LAKE/RESERVOIR	1,120	1,120	1,120	1,120	1,120	1,120
G	WOODWAY	BRAZOS	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM	1,362	1,355	1,342	1,305	1,288	1,259
G	WOODWAY	BRAZOS	WACO LAKE/RESERVOIR	429	655	857	1,081	1,314	1,546
	Sum of Projected Surface Water Supplies (acre-feet)			**63,229**	**61,329**	**59,397**	**57,351**	**55,404**	**53,408**

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.

MCLENNAN COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
G	BELLMEAD	BRAZOS	1,241	1,269	1,296	1,339	1,397	1,457
G	BEVERLY HILLS	BRAZOS	252	261	268	281	297	312
G	BRUCEVILLE-EDDY	BRAZOS	292	307	322	338	357	376
G	CHALK BLUFF WSC	BRAZOS	269	258	249	245	244	244
G	CORYELL CITY WATER SUPPLY DISTRICT	BRAZOS	125	147	166	186	207	227
G	COUNTY-OTHER, MCLENNAN	BRAZOS	3,533	3,409	3,306	3,249	3,236	3,233
G	CRAWFORD	BRAZOS	149	147	147	147	149	151
G	CROSS COUNTRY WSC	BRAZOS	409	406	403	405	409	413
G	ELM CREEK WSC	BRAZOS	200	221	241	262	285	308
G	GHOLSON	BRAZOS	155	167	178	190	204	218
G	GOLINDA	BRAZOS	19	24	28	32	36	40
G	HALLSBURG	BRAZOS	81	84	87	92	97	102
G	HEWITT	BRAZOS	2,711	3,036	3,329	3,643	3,975	4,305
G	IRRIGATION, MCLENNAN	BRAZOS	4,880	4,877	4,872	4,867	4,862	4,858
G	LACY-LAKEVIEW	BRAZOS	772	817	859	908	966	1,025
G	LIVESTOCK, MCLENNAN	BRAZOS	1,584	1,584	1,584	1,584	1,584	1,584
G	LORENA	BRAZOS	309	339	367	396	429	461
G	MANUFACTURING, MCLENNAN	BRAZOS	5,087	5,724	6,373	6,955	7,532	8,157
G	MART	BRAZOS	352	368	383	401	423	445
G	MCGREGOR	BRAZOS	796	808	820	840	869	899
G	MINING, MCLENNAN	BRAZOS	2,538	3,000	3,060	3,508	3,832	4,216
G	MOODY	BRAZOS	189	196	202	211	223	235
G	NORTH BOSQUE WSC	BRAZOS	619	751	870	990	1,112	1,233
G	RIESEL	BRAZOS	136	136	136	137	140	144
G	ROBINSON	BRAZOS	2,437	2,855	3,229	3,618	4,020	4,418
G	STEAM ELECTRIC POWER, MCLENNAN	BRAZOS	6,990	8,914	9,683	11,155	11,929	12,756
G	TRI-COUNTY SUD	BRAZOS	21	23	25	28	31	33
G	VALLEY MILLS	BRAZOS	5	7	8	10	11	13
G	WACO	BRAZOS	31,576	33,377	35,005	36,840	38,861	40,887
G	WEST	BRAZOS	490	495	500	509	523	538
G	WEST BRAZOS WSC	BRAZOS	186	193	201	212	224	236
G	WESTERN HILLS WS	BRAZOS	212	226	238	250	262	274
G	WOODWAY	BRAZOS	3,477	3,703	3,905	4,129	4,362	4,594

Sum of Projected Water Demands (acre-feet)	**72,092**	**78,129**	**82,340**	**87,957**	**93,088**	**98,392**

Projected Water Supply Needs
TWDB 2017 State Water Plan Data

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

MCLENNAN COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
G	BELLMEAD	BRAZOS	261	233	206	163	105	45
G	BEVERLY HILLS	BRAZOS	0	0	0	0	0	0
G	BRUCEVILLE-EDDY	BRAZOS	1,081	1,061	1,037	996	965	927
G	CHALK BLUFF WSC	BRAZOS	446	457	466	470	471	471
G	CORYELL CITY WATER SUPPLY DISTRICT	BRAZOS	31	34	36	36	36	35
G	COUNTY-OTHER, MCLENNAN	BRAZOS	84	204	301	344	349	340
G	CRAWFORD	BRAZOS	-5	-3	-3	-3	-5	-7
G	CROSS COUNTRY WSC	BRAZOS	76	79	82	0	0	0
G	ELM CREEK WSC	BRAZOS	63	37	9	-24	-54	-85
G	GHOLSON	BRAZOS	772	760	749	737	723	709
G	GOLINDA	BRAZOS	1	1	0	1	0	0
G	HALLSBURG	BRAZOS	0	0	0	0	0	0
G	HEWITT	BRAZOS	-87	-237	-211	-204	-215	-231
G	IRRIGATION, MCLENNAN	BRAZOS	-2,298	-2,313	-2,325	-2,337	-2,350	-2,363
G	LACY-LAKEVIEW	BRAZOS	348	303	261	212	154	95
G	LIVESTOCK, MCLENNAN	BRAZOS	0	0	0	0	0	0
G	LORENA	BRAZOS	153	123	95	66	33	1
G	MANUFACTURING, MCLENNAN	BRAZOS	-1,664	-1,916	-2,204	-2,417	-2,664	-2,834
G	MART	BRAZOS	-150	-166	-181	-199	-221	-243
G	MCGREGOR	BRAZOS	2,066	2,040	2,004	1,904	1,842	1,759
G	MINING, MCLENNAN	BRAZOS	-2,264	-2,726	-2,786	-3,234	-3,558	-3,942
G	MOODY	BRAZOS	423	414	404	384	367	347
G	NORTH BOSQUE WSC	BRAZOS	-14	-146	-265	-385	-507	-628
G	RIESEL	BRAZOS	-11	-11	-11	-12	-15	-19
G	ROBINSON	BRAZOS	72	-346	-720	-1,109	-1,511	-1,909
G	STEAM ELECTRIC POWER, MCLENNAN	BRAZOS	22,931	21,000	20,224	18,744	17,963	17,129
G	TRI-COUNTY SUD	BRAZOS	-3	-4	-3	-4	-5	-6
G	VALLEY MILLS	BRAZOS	1	1	0	0	0	0
G	WACO	BRAZOS	12,489	9,894	7,376	4,614	1,694	-1,348
G	WEST	BRAZOS	898	893	888	879	865	850
G	WEST BRAZOS WSC	BRAZOS	-73	-79	-84	-90	-101	-112
G	WESTERN HILLS WS	BRAZOS	332	318	306	294	282	270
G	WOODWAY	BRAZOS	0	-7	-20	-57	-74	-103
	Sum of Projected Water Supply Needs (acre-feet)		**-6,569**	**-7,954**	**-8,813**	**-10,075**	**-11,280**	**-13,830**

Projected Water Management Strategies
TWDB 2017 State Water Plan Data

MCLENNAN COUNTY

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

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
BELLMEAD, BRAZOS (G)							
REUSE- WMARSS BELLMEAD/ LACY-LAKEVIEW	DIRECT REUSE [MCLENNAN]	1,120	1,120	1,120	1,120	1,120	1,120
		1,120	**1,120**	**1,120**	**1,120**	**1,120**	**1,120**
BRUCEVILLE-EDDY, BRAZOS (G)							
BRA SYSTEM OPERATIONS-LITTLE RIVER	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	5	14	39	51	71
MUNICIPAL WATER CONSERVATION (SUBURBAN) - BRUCEVILLE-EDDY	DEMAND REDUCTION [MCLENNAN]	11	33	38	36	38	40
		11	**38**	**52**	**75**	**89**	**111**
CORYELL CITY WATER SUPPLY DISTRICT, BRAZOS (G)							
MUNICIPAL WATER CONSERVATION (SUBURBAN) - CORYELL CITY WATER SUPPLY DISTRICT	DEMAND REDUCTION [MCLENNAN]	5	3	1	0	0	0
		5	**3**	**1**	**0**	**0**	**0**
COUNTY-OTHER, MCLENNAN, BRAZOS (G)							
MCLENNAN COUNTY ARSENIC MITIGATION	WACO LAKE/RESERVOIR [RESERVOIR]	971	1,029	1,092	1,163	1,239	1,325
		971	**1,029**	**1,092**	**1,163**	**1,239**	**1,325**
CRAWFORD, BRAZOS (G)							
MUNICIPAL WATER CONSERVATION (SUBURBAN) - CRAWFORD	DEMAND REDUCTION [MCLENNAN]	7	16	27	28	28	29
		7	**16**	**27**	**28**	**28**	**29**
CROSS COUNTRY WSC, BRAZOS (G)							
MUNICIPAL WATER CONSERVATION (SUBURBAN) - CROSS COUNTRY WSC	DEMAND REDUCTION [MCLENNAN]	15	18	10	7	6	6
TRINITY - MCLENNAN COUNTY ASR	TRINITY AQUIFER ASR [MCLENNAN]	0	0	0	26	20	14
		15	**18**	**10**	**33**	**26**	**20**
ELM CREEK WSC, BRAZOS (G)							
BRA SYSTEM OPERATIONS-LITTLE RIVER	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	0	0	24	54	85
		0	**0**	**0**	**24**	**54**	**85**
HEWITT, BRAZOS (G)							
MUNICIPAL WATER CONSERVATION (SUBURBAN) - HEWITT	DEMAND REDUCTION [MCLENNAN]	22	35	16	14	12	12

REUSE- WMARSS BULLHIDE CREEK	DIRECT REUSE [MCLENNAN]	1,223	1,223	1,223	1,223	1,223	1,223
		1,245	**1,258**	**1,239**	**1,237**	**1,235**	**1,235**
IRRIGATION, MCLENNAN, BRAZOS (G)							
BRAZOS RIVER ALLUVIUM DEVELOPMENT	BRAZOS RIVER ALLUVIUM AQUIFER [MCLENNAN]	2,200	2,200	2,200	2,200	2,200	2,200
IRRIGATION WATER CONSERVATION	DEMAND REDUCTION [MCLENNAN]	146	244	341	341	340	340
		2,346	**2,444**	**2,541**	**2,541**	**2,540**	**2,540**
LACY-LAKEVIEW, BRAZOS (G)							
REUSE- WMARSS BELLMEAD/ LACY-LAKEVIEW	DIRECT REUSE [MCLENNAN]	1,120	1,120	1,120	1,120	1,120	1,120
		1,120	**1,120**	**1,120**	**1,120**	**1,120**	**1,120**
LORENA, BRAZOS (G)							
MUNICIPAL WATER CONSERVATION (SUBURBAN) - LORENA	DEMAND REDUCTION [MCLENNAN]	10	3	0	0	0	0
REUSE- WMARSS BULLHIDE CREEK	DIRECT REUSE [MCLENNAN]	448	448	448	448	448	448
		458	**451**	**448**	**448**	**448**	**448**
MANUFACTURING, MCLENNAN, BRAZOS (G)							
INDUSTRIAL WATER CONSERVATION	DEMAND REDUCTION [MCLENNAN]	153	286	446	487	527	571
REUSE- WMARSS FLAT CREEK	DIRECT REUSE [MCLENNAN]	1,600	1,700	1,800	2,000	2,200	2,500
		1,753	**1,986**	**2,246**	**2,487**	**2,727**	**3,071**
MART, BRAZOS (G)							
MUNICIPAL WATER CONSERVATION (SUBURBAN) - MART	DEMAND REDUCTION [MCLENNAN]	0	1	0	0	0	1
TRINITY - MCLENNAN COUNTY ASR	TRINITY AQUIFER ASR [MCLENNAN]	249	249	249	249	249	248
		249	**250**	**249**	**249**	**249**	**249**
MINING, MCLENNAN, BRAZOS (G)							
BRAZOS RIVER ALLUVIUM DEVELOPMENT	BRAZOS RIVER ALLUVIUM AQUIFER [MCLENNAN]	1,800	1,800	1,800	2,500	2,500	2,900
INDUSTRIAL WATER CONSERVATION	DEMAND REDUCTION [MCLENNAN]	76	150	214	246	268	295
REUSE- WMARSS FLAT CREEK	DIRECT REUSE [MCLENNAN]	811	811	811	811	811	811
		2,687	**2,761**	**2,825**	**3,557**	**3,579**	**4,006**
NORTH BOSQUE WSC, BRAZOS (G)							
MUNICIPAL WATER CONSERVATION (SUBURBAN) - NORTH BOSQUE WSC	DEMAND REDUCTION [MCLENNAN]	33	99	183	280	390	452
TRINITY - MCLENNAN COUNTY ASR	TRINITY AQUIFER ASR [MCLENNAN]	0	200	200	200	200	200
		33	**299**	**383**	**480**	**590**	**652**
RIESEL, BRAZOS (G)							
MCLENNAN COUNTY ARSENIC MITIGATION	WACO LAKE/RESERVOIR [RESERVOIR]	78	78	78	78	80	82
RMS WSC REDUCTION FOR RIESEL	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM [RESERVOIR]	20	20	20	20	20	20

		98	**98**	**98**	**98**	**100**	**102**
ROBINSON, BRAZOS (G)							
INCREASE WTP CAPACITY-ROBINSON	BRAZOS RUN-OF-RIVER [MCLENNAN]	0	2,240	2,240	2,240	2,240	2,240
MUNICIPAL WATER CONSERVATION (SUBURBAN) - ROBINSON	DEMAND REDUCTION [MCLENNAN]	91	316	507	549	605	663
		91	**2,556**	**2,747**	**2,789**	**2,845**	**2,903**
TRI-COUNTY SUD, BRAZOS (G)							
CARRIZO AQUIFER DEVELOPMENT	CARRIZO-WILCOX AQUIFER [LIMESTONE]	7	7	8	9	10	10
		7	**7**	**8**	**9**	**10**	**10**
VALLEY MILLS, BRAZOS (G)							
BOSQUE COUNTY REGIONAL PROJECT	CLIFTON LAKE/RESERVOIR [RESERVOIR]	3	5	5	6	7	8
MUNICIPAL WATER CONSERVATION (URBAN) - VALLEY MILLS	DEMAND REDUCTION [MCLENNAN]	0	1	1	2	2	2
		3	**6**	**6**	**8**	**9**	**10**
WACO, BRAZOS (G)							
CONSERVATION - METER ENHANCEMENT PROGRAM - WACO	DEMAND REDUCTION [MCLENNAN]	698	2,237	2,346	2,469	2,604	2,740
MUNICIPAL WATER CONSERVATION (URBAN) - WACO	DEMAND REDUCTION [MCLENNAN]	764	1,796	4,435	7,312	9,336	9,814
REUSE- WMARSS BELLMEAD/ LACY-LAKEVIEW	DIRECT REUSE [MCLENNAN]	0	0	0	0	0	0
TRINITY - MCLENNAN COUNTY ASR	TRINITY AQUIFER ASR [MCLENNAN]	7,750	7,550	7,550	7,400	7,400	7,400
		9,212	**11,583**	**14,331**	**17,181**	**19,340**	**19,954**
WEST, BRAZOS (G)							
MUNICIPAL WATER CONSERVATION (SUBURBAN) - WEST	DEMAND REDUCTION [MCLENNAN]	15	23	13	7	6	6
		15	**23**	**13**	**7**	**6**	**6**
WEST BRAZOS WSC, BRAZOS (G)							
CARRIZO AQUIFER DEVELOPMENT	CARRIZO-WILCOX AQUIFER [FALLS]	94	96	98	102	104	112
		94	**96**	**98**	**102**	**104**	**112**
WOODWAY, BRAZOS (G)							
BRA SYSTEM OPERATIONS-LITTLE RIVER	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	7	20	57	74	103
MUNICIPAL WATER CONSERVATION (SUBURBAN) - WOODWAY	DEMAND REDUCTION [MCLENNAN]	208	512	832	1,180	1,541	1,906
		208	**519**	**852**	**1,237**	**1,615**	**2,009**
Sum of Projected Water Management Strategies (acre-feet)		**21,748**	**27,681**	**31,506**	**35,993**	**39,073**	**41,117**

SOUTHERN TRINITY GROUNDWATER CONSERVATION DISTRICT RULES

Initially Adopted and Effective December 6, 2007
Revised February 28, 2008
Revised January 7, 2010
Revised December 15, 2011
Revised August 16, 2012
Revised April 23, 2015
Amended and Effective August 29, 2019

SOUTHERN TRINITY GROUNDWATER CONSERVATION DISTRICT RULES

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CHAPTER 1. DEFINITIONS AND GENERAL PROVISIONS

§ 1.1 Definitions of Terms

In the administration of its duties, the Southern Trinity Groundwater Conservation District follows the definitions of words, terms and phrases set forth in Chapter 8821 of the Special District Local Laws Code, Chapters 35 and 36 of the Texas Water Code, Chapters 1901 and 1902 of the Texas Occupations Code. In addition, the following words, terms and phrases, when used in these rules, and when used in any other rule or regulation of the District and not defined therein, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning. Words used in the present tense include the future tense. Words used in the plural number include the singular, and words in the singular include the plural. The word "shall" is always mandatory. The word "herein" means in these rules. The word "regulations" means the provisions of any applicable resolution, order, rule, regulation or policy.

(1) "Abandoned well" means a well that has not been in use for six consecutive months. A well is considered to be in use when the well is not a deteriorated well and contains the casing, pump, and pump column in good condition, or when the well is not a deteriorated well and has been properly capped.

(2) "Acre-foot" means the amount of water necessary to cover one acre of land one foot deep; 325,851 U.S. gallons of water.

(3) "Affected person" means a person who has a personal justiciable interest related to a legal right, duty, privilege, power, or economic interest that is within the District's regulatory authority and is or may be affected by the application in question. An interest common to members of the general public does not qualify as a personal justiciable interest.

(4) "Agricultural use" means a use or activity involving any of the following:

(A) cultivating the soil to produce crops for human food, animal feed, or planting seed, or for the production of fibers;

(B) the practice of floriculture, viticulture, silvicuture, and horticulture, including the cultivation of plants in containers, or nonsoil media, by a nursery grower;

(C) raising, feeding, or keeping animals for breeding purposes or for the production of food or fiber, leather, pelts, or other tangible products having a commercial value;

(D) planting cover crops, including cover crops cultivated for transplantation, or leaving land idle for the purpose of participating in any governmental program or normal crop or livestock rotation procedure;

(E) wildlife management; and

(F) raising or keeping equine animals.

(5) "Aquifer" means a geologic formation, group of formations, or part of a formation that is capable of yielding a significant amount of water to a well or spring.

(6) "Aquifer management zone" means the geographic surface area located within the District's boundaries in which the amount of groundwater production from non-exempt wells is predominantly from a single and identical water bearing geologic strata of either the Hensell or the Hosston strata (geologic member) of the Trinity group of geologic formations.

(7) "Beneficial Use" means the use of the amount of water that is necessary for a purpose authorized by law when reasonable intelligence and reasonable diligence are used in applying the water to that purpose.

(8) "Best Management Practice (BMP)" means any of the water conservation practices that are identified in Texas Water Development Board Report 362.

(9) "Board" means the board of directors of the District.

(10) "Brazos River Alluvium Aquifer" means the water-bearing alluvial sediments occurring in floodplain and terrace deposits of the Brazos River. The Brazos River Alluvium Aquifer is defined by the Texas Water Development Board as a minor aquifer.

(11) "Business day" means a weekday, Monday through Friday, excluding District holidays.

(12) "Casing" means a watertight pipe which is installed in an excavated or drilled hole, temporarily or permanently, to maintain the hole sidewalls against caving, advance the borehole, and in conjunction with cementing and/or bentonite grouting, to confine the ground waters to their respective zones of origin, and to prevent surface contaminant infiltration.

(13) "Casing diameter" means the inside diameter of the casing of a well.

(14) "Conjunctive Use" means the combined use of groundwater and surface water sources that optimizes the beneficial characteristics of each source.

(15) "Contested case hearing" means a proceeding before the District, or where appropriate, the State Office of Administrative Hearings, in which the legal rights, duties or privileges of a party are to be determined by the board after an opportunity for an adjudicative hearing.

(16) "Contract user" means a person who withdrew or purchased groundwater during the Existing and Historic Use Period pursuant to a contract or other legal right from an existing well on land owned by another.

(17) "Desired Future Condition (DFC)" means the desired, quantified condition of groundwater resources for a specific aquifer within the District as defined in the District's Groundwater Management Plan and implemented by the District.

(18) "Deteriorated well" means a well or borehole that because of its condition, will cause, or may cause, pollution of any water in the state, including any groundwater, or cause a public nuisance.

(19) "Dewatering well" means a temporary well used to remove water from a construction site or excavation for a non-consumptive use.

(20) "District" means the Southern Trinity Groundwater Conservation District.

(21) "District Act" means the Chapter 8821 of the Special District Local Laws Code, as may be amended.

(22) "District Office" means the location of the office of the District, as designated by the Board by written resolution. The location of the District Office may be changed from time to time by written resolution of the Board.

(23) "Domestic Use" means the private use of water to provide the daily water needs of a household, and includes water used on-site for: drinking, washing or culinary purposes; residential landscape watering, or watering of a family garden/orchard; watering of domestic animals; and for residential water recreation uses (e.g., swimming pool, hot tub). Domestic use does not include water used by, or to support, activities for which consideration is given or received or for which the product of the activity is sold. Domestic use does not include use by or for a public water system.

(24) "Drilling permit" means a permit issued by the District allowing for the construction, drilling, installation, equipping, completion, reworking, alteration, or modification of a well, or other work designed for the production of groundwater.

(25) "Evidence of Historic or Existing Use" means evidence that is material and relevant to a determination of the amount of groundwater beneficially used without waste by a permit applicant during the relevant time period set by District rule that regulates groundwater based on Historic Use. Evidence in the form of oral or written testimony shall be subject to cross-examination. The Texas Rules of Evidence govern the admissibility and introduction of Evidence of Historic or Existing Use, except that evidence not admissible under the Texas Rules of Evidence may be admitted if it is of the type commonly relied upon by reasonably prudent persons in the conduct of their affairs.

(26) "Exempt well" means any groundwater withdrawal well exempt from the requirement to obtain a permit under these rules.

(27) "Existing and Historic Use Period" means the time period from January 1, 2000, through December 31, 2009.

(28) "Existing well" means a well which:

(A) was in existence on or for which drilling had commenced on December 31, 2009;

(B) is capable of having water withdrawn from it; and

(C) was properly constructed in accordance with District rules and applicable state law.

(29) "Federal conservation program" means the Conservation Reserve Program of the United States Department of Agriculture or any successor program.

(30) "Groundwater" means water percolating beneath the earth's surface within the boundaries of the District.

(31) "Groundwater Production" means to withdraw, pump, or otherwise obtain groundwater from an underground source.

(32) "Groundwater exportation permit" means a permit authorizing a person to export groundwater produced from a well within the District's boundaries pursuant to an authorization issued by the District to a place of use outside of the District's boundaries.

(33) "Hearing body" means the board, any committee of the board, or a hearing examiner that conducts a contested case hearing.

(34) "Hearing examiner" means the person appointed by the board or the State Office of Administrative Hearings to conduct a contested case hearing or other proceeding.

(35) "Hensell Management Zone" means the geographic surface area shown on Exhibit A and general located in the northwestern portion of McLennan County.

(36) "Historic Use" means the lawful production and placing to beneficial use, without waste, of groundwater during the Existing and Historic Use Period.

(37) "Historic Use Production Permit" means a permit authorizing a landowner or operator to produce groundwater based on a landowner or his or her contract user or predecessor in interest's production and beneficial use of groundwater without waste during the Existing and Historic Use Period.

(38) "Hosston Management Zone" means the geographic surface area shown on Exhibit B and general located in the central and southeastern portion of McLennan County.

(39) "Industrial use" means the use of water for or in connection with industrial activities, including but not limited to, manufacturing, bottling, brewing, food processing, scientific research and technology, recycling, production of concrete, asphalt, and cement, quarrying, commercial uses of water for tourism, entertainment, and hotel or motel lodging, generation of power other than for hydroelectric, and other business activities.

(40) "Landowner" means the person who owns the land surface or the right to withdraw groundwater from wells located on such land surface.

(41) "Leachate well" means a well used to remove contamination from soil or

groundwater.

(42) "Livestock use" means the watering of animals, including beasts or poultry, but does not include the watering of any animal that is stabled, confined, or fed at a facility that is defined by Texas Commission on Environmental Quality Rules as an "animal feeding operation" or a "concentrated animal feeding operation."

(43) "Modeled Available Groundwater" or "MAG" means the amount of groundwater that is determined by the executive administrator of the Texas Water Development Board to be produced on an annual basis in a given aquifer to achieve a Desired Future Condition under Section 36.108, Texas Water Code for that aquifer.

(44) "Maximum Historic Use (MHU)" or "MHU" means the maximum amount of groundwater that an applicant for an Historic Use Production Permit proves was produced and beneficially used without waste from the applicant's non-exempt well during any one calendar year of the Existing and Historic Use Period.

(45) "Meter" means a water flow measuring device that can, within +/- 5% of accuracy, measure the instantaneous rate of flow and record the amount of groundwater produced from a well during a measure of time.

(46) "Monitoring well" means a well used solely for the purpose of measuring some property of the groundwater or the aquifer it penetrates, and that does not produce more than 5,000 gallons of groundwater per year.

(47) "Municipal use" means the use of water, within or outside of a municipality and its environs, whether supplied by a person, a municipality, a utility, a political subdivision, or other entity for domestic, industrial, or commercial uses, and fire fighting, sewer and drain flushing, swimming pools, and maintenance of public property.

(48) "New well" means a well for which drilling commenced after December 31, 2009.

(49) "Non-agricultural use" means the beneficial use of groundwater withdrawn from within the boundaries of the District for any use other than agricultural use.

(50) "Non-exempt well" means a well not exempt from the requirement to obtain a permit under these rules.

(51) "Non-Historic Use Production Permit" means a permit authorizing a landowner or operator to produce groundwater that is not based on Historic Use.

(52) "Open well" means a well, or exploratory hole, dug or drilled for the purpose of exploring for or producing water from the aquifer that is not capped or covered.

(53) "Open Meetings Law" means Chapter 551, Texas Government Code, as may be amended.

(54) "Party" means each person admitted as a party in a contested case hearing.

(55) "Permit" means a document issued by the District approving an application for a permit.

(56) "Permitted well" means a groundwater withdrawal well authorized to operate by a permit issued by the District.

(57) "Person" means a corporation, individual, organization, government, or governmental subdivision or agency, business trust, estate, trust, partnership, association or any other legal entity.

(58) "Pleadings" means any document filed by a party in a contested case hearing.

(59) "Pollution" means the alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water in the state, including groundwater, that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property or to the public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose, including the alteration of groundwater by saltwater or other deleterious matter admitted from another stratum or from the surface of the ground.

(60) "Presiding officer" means the President, Vice President, Secretary, or other board member presiding at any hearing or other proceeding or a hearing examiner conducting any hearing or other proceeding on behalf of the District.

(61) "Protestant" means any person opposing, in whole or in part, an application for which a request for a contested case hearing may be filed under the District rules.

(62) "Public Information Act" means Chapter 552, Texas Government Code, also referred to as the "Open Records Law," as may be amended from time to time.

(63) "Public water supply" means a water supply system that meets the requirements of 30 Texas Administrative Code § 290.38.

(64) "Registration" means a certificate issued by the District for a well that qualifies as an exempt well.

(65) "Replacement well" means any well drilled in accordance with the requirements of these rules with the purpose of replacing a well and drilled within 150 feet of the well to be replaced.

(66) "Reworked well" means a well that has been altered, modified, repaired or recompleted.

(67) "Rules" means the rules of the District compiled in this document and as may be supplemented or amended from time to time.

(68) "Section," as related to land, means the numbered section of a survey or block as

shown in a county's real property records.

(69) "Sewage wet well" means a sewage well which incorporates a reservoir in addition to a pump.

(70) "SOAH" means the State Office of Administrative Hearings.

(71) "Solid waste" means garbage, rubbish, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, municipal, commercial, mining, and agricultural operations and from community and institutional activities. The term:

(A) does not include:

(i) solid or dissolved material in domestic sewage, or solid or dissolved material in irrigation return flows, or industrial discharges subject to regulation by permit issued under Chapter 26, Water Code;

(ii) soil, dirt, rock, sand, and other natural or man-made inert solid materials used to fill land if the object of the fill is to make the land suitable for the construction of surface improvements; or

(iii) waste materials that result from activities associated with the exploration, development, or production of oil or gas or geothermal resources and other substance or material regulated by the Railroad Commission of Texas under Section 91.101, Texas Natural Resources Code, unless the waste, substance, or material results from activities associated with gasoline plants, natural gas or natural gas liquids processing plants, pressure maintenance plants, or repressurizing plants and is hazardous waste as defined by the administrator of the United States Environmental Protection Agency under the federal Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, as amended (42 U.S.C. Section 6901 et seq.); and

(B) does include hazardous substances.

(72) "TDLR" means the Texas Department of Licensing and Regulation.

(73) "Trinity Aquifer" means the water-bearing geological group comprised of the Paluxy, Glenn Rose, Hensell, Pearsall, Cow Creek, Hammett, Sligo, and Hosston geologic formations. The Trinity Aquifer is defined by the Texas Water Development Board as a major aquifer.

(74) "Total aquifer storage" means the total calculated volume of groundwater that an aquifer is capable of producing.

(75) "Uncovered well" means an open well.

(76) "Waste" means any one or more of the following:

(A) production of groundwater at a rate and in an amount that causes or threatens to cause intrusion into an aquifer of water unsuitable for agricultural, gardening, domestic, or stock watering purposes;

(B) the flowing or producing of wells from an aquifer if the water produced is not used for a beneficial purpose;

(C) escape of groundwater from an aquifer to any other reservoir or geologic strata that does not contain groundwater;

(D) pollution or harmful alteration of groundwater in an aquifer by saltwater or by other deleterious matter admitted from another stratum or from the surface of the ground;

(E) willfully or negligently causing, suffering, or allowing groundwater produced from an aquifer to escape into any river, creek, natural watercourse, depression, lake, reservoir, drain, sewer, street, highway, road, or ditch, or onto any land other than that of the owner of the well unless such discharge is authorized by permit, rule, or order issued by the Texas Commission on Environmental Quality under Chapter 26, Texas Water Code, as may be amended;

(F) groundwater pumped for irrigation that escapes as irrigation tailwater onto land other than that of the owner of the well unless permission has been granted by the occupant of the land receiving the discharge; or

(G) for water produced from an artesian well, "waste" has the meaning assigned by Section 11.205, Texas Water Code, as may be amended.

(77) "Well" means any artificial opening or excavation in the ground to a depth greater than the top of any stratum containing groundwater.

(78) "Well operator" means the person who operates a well located on land owned by the well operator or owned by a third-party.

(79) "Well owner" means the person who owns the land upon which a well is, or is proposed to be, located.

(80) "Well system" means a well or group of wells tied together by pipeline and/or storage facilities.

(81) "Windmill" means a wind-driven or hand-driven device that uses a piston pump to withdraw groundwater.

(82) "Withdraw or Withdrawal" means producing or obtaining groundwater using man-made facilities by pumping or another method.

Exhibit A.

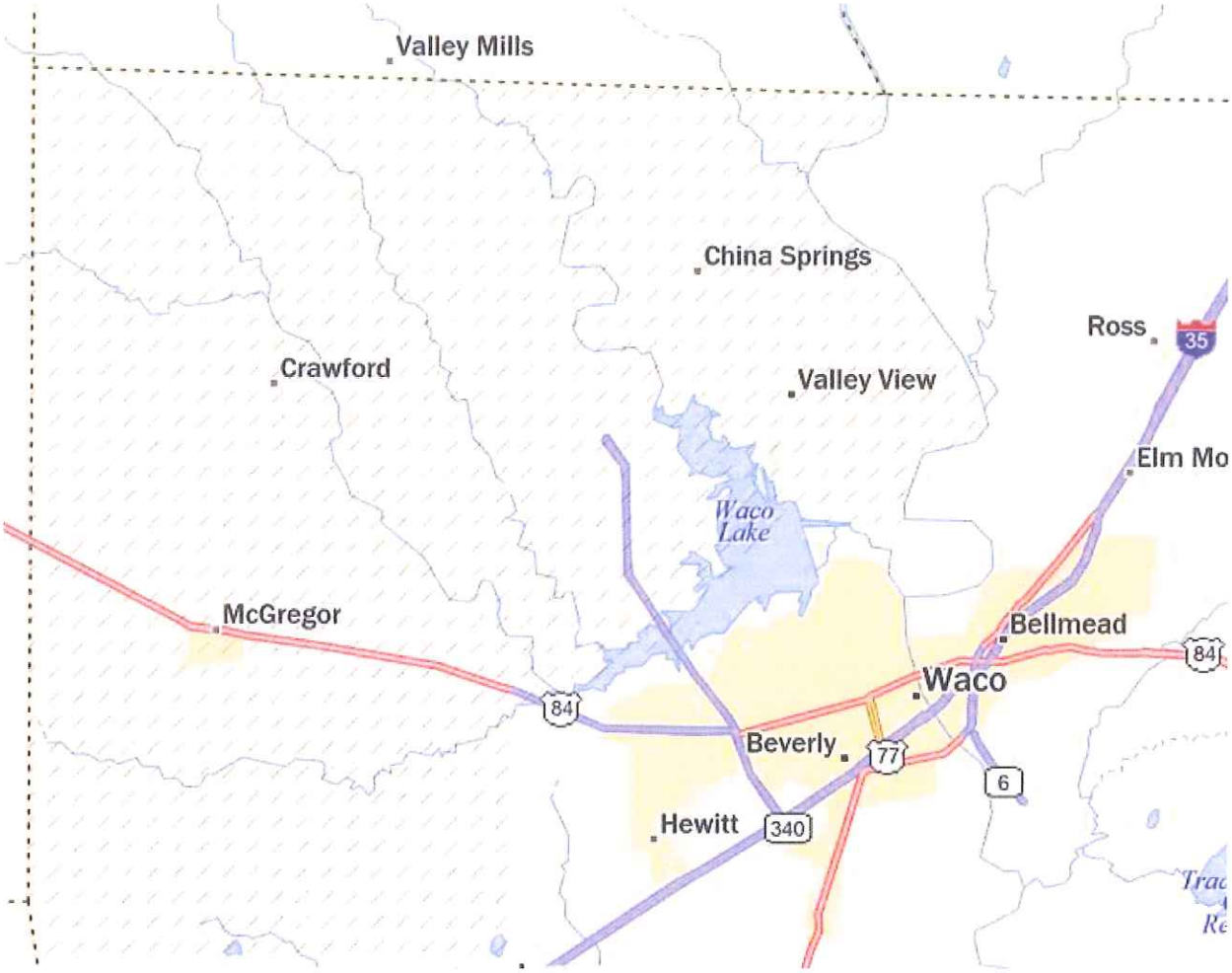

Exhibit A.: Hensell Management Zone (shown as hatched area)

Exhibit B.

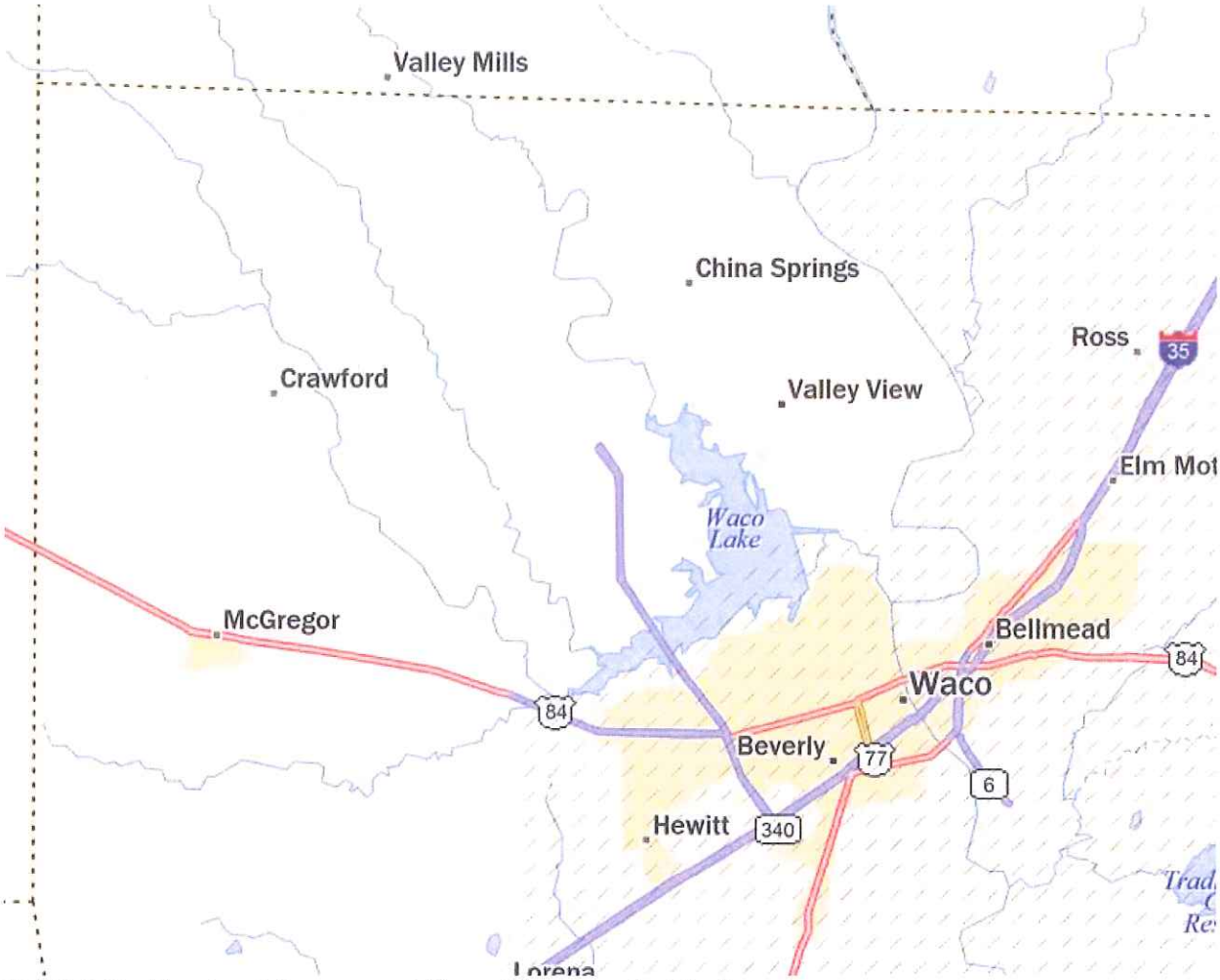

Exhibit B.: Hosston Management Zone (shown as hatched area)

§ 1.3 Purpose of Rules

These rules are adopted to achieve the objectives of Article XVI, Section 59, Texas Constitution, the District Act, Chapter 36, Texas Water Code, the District's approved groundwater management plan, and other general laws applicable to the District, as may be amended.

§ 1.5 Construction

Construction of words and phrases is governed by the Code Construction Act, Subchapter B, Chapter 311, Texas Government Code. References to a code or statutory provision or section in these rules shall include such code or statutory provision as amended, reordered or re-codified. These rules shall be read, interpreted and applied in a manner that is consistent with the District Act and, if any definition or provision of these rules conflicts with or is inconsistent with any definition or provision of the District Act such definition or rule shall be read, construed and applied consistent with the District Act which shall govern and control.

§ 1.7 Headings and Captions

The section and other headings and captions contained in these rules are for reference purposes only. They do not affect the meaning or interpretation of these rules in any way.

§ 1.9 Methods of Service under the Rules

Except as otherwise expressly provided in these rules, any notice or documents required by these rules to be served or delivered may be delivered to the recipient, or the recipient's authorized representative, in person, by agent, by courier receipted delivery, by certified mail sent to the recipient's last known address, by electronic mail to the recipient's electronic mail address on file with the District, or by telephonic document transfer to the recipient's current telecopier number and shall be accomplished by 5:00 p.m. (local time) of the date on which it is due. Service by mail is complete upon delivery in a post office or other official depository of the United States Postal Service. Service by telephonic document transfer is complete upon transfer, except that any transfer occurring after 5:00 p.m. will be deemed complete on the following business day. If service or delivery is by mail, and the recipient has the right, or is required, to do some act within a prescribed time after service, three days will be added to the prescribed period.

Where service by one or more of the above methods has been attempted and has failed, service may be completed by any other of the above-authorized methods of service. If personal service is not made or deemed to be made as above provided, if the location of a person to be served is unknown to the board, if unknown persons may have a property interest in the matter at issue, or in addition to any other service made, notice may be given by publication and the service by publication is complete upon the notice being published in a newspaper of general circulation in the District. Further, upon approval by the board, notice may be given in any manner authorized by the Texas Rules of Civil Procedure.

The person or the person's attorney of record shall certify compliance with this rule in writing over signature on the filed document. A certificate by a person or the person's attorney of

record, or the return of an officer, or the affidavit of any person showing service of a document, shall be prima facie evidence of the fact of service. Nothing herein shall preclude any person from offering proof that the notice or instrument was not received and upon so finding, the District may extend the time for taking the action required of such party or grant such other relief as it deems just. In contested case hearings, copies of all documents filed with the presiding officer shall be served on all parties, including the District, no later than the day of filing.

§ 1.11 Severability

If any one or more of the provisions contained in these rules is for any reason held to be invalid, illegal, or unenforceable in any respect, the invalidity, illegality, or unenforceability does not affect any other rules or provisions of these rules, and these rules must be construed as if such invalid, illegal, or unenforceable rule or provision had never been contained in these rules.

§ 1.12 Amendment of Rules

The Board may, following applicable notice, hearing, process and procedural requirements set forth in these rules and in Chapter 36, Texas Water Code, amend these rules and adopt new rules from time to time. These rules, as amended, shall apply to all groundwater usage within the territorial boundaries of the District.

CHAPTER 2. BOARD

§ 2.1 Purpose of the Board

The board was created to determine policy and regulate the withdrawal and use of groundwater within the boundaries of the District for conserving, preserving, protecting and recharging the groundwater within the District, and to exercise the District's rights, powers, and duties in a way that will effectively and expeditiously accomplish the purposes of the District Act and Chapter 36, Water Code. The board's responsibilities include, but are not limited to, the adoption and enforcement of reasonable rules and other orders.

§ 2.3 Ex Parte Communications

Board members may not communicate, directly or indirectly, about any issue of fact or law in any contested case that is before the board, with any agency, person, party or their representatives, except on notice and opportunity for all parties to participate. A board member may not communicate ex parte with other members of the board. This rule does not apply to a board member who abstains from voting on any matter in which ex parte communications have occurred.

CHAPTER 3. DISTRICT STAFF

§ 3.1 General Manager

The board may employ or contract with a person to serve as general manager of the District and to perform such services as the board may from time to time specify. The board may delegate to the general manager full authority to manage and operate the affairs of the District subject to these rules and orders of the board. The general manager, with approval of the board, may employ all persons necessary for the proper handling of business and operation of the District, and their salaries will be set by the board.

If the position of general manager is vacant, the board may appoint an interim manager, or act to manage the District and perform any function of the general manager identified by these rules.

CHAPTER 4. DISTRICT RECORDS

§ 4.1 Minutes and Records of the District

All documents, reports, records, and minutes of the District are available for public inspection and copying consistent with the requirements of the Public Information Act. Copying charges may be assessed by the District. A list of charges for copies will be furnished by the District.

§ 4.3 Certified Copies

Requests for certified copies must be in writing. Certified copies will be made under the direction of the board. Certification charges may be assessed by the District.

§ 4.5 Notice of Change of Address or Phone Number

Applicants, registrants, permittees, and other persons with a permit with or a matter or proceeding before the District shall give written notice to the District of any change of ownership, well operator, contact person for District matters, electronic mail address, mailing address or telephone number within 30 days of such change.

§ 4.7 Contact Information for Permittee Management and Operator

If a permittee is a corporation, district, county, municipality, trust, estate or partnership, the permittee shall provide the District with contact information, including electronic mail address, mailing address and telephone number, for the officers, principals, board members or managers of the governing body of the entity and for the operator of any wells within 30 days of the District's written request and as part of its annual groundwater use report.

CHAPTER 5. GROUNDWATER PRODUCTION

Subchapter A. General Provisions

§ 5.1 Beneficial Use; Prohibition on Waste

Groundwater produced within the District may only be used for a beneficial purpose. No person may produce or use groundwater in a manner that constitutes waste. Any person producing or using groundwater from within the District shall employ all reasonable methods to identify, prevent and stop the waste of water.

§ 5.3 Operation of Well at Higher Than Authorized Rate or Amount Prohibited

No person may operate a well within the District's boundaries at a rate of production higher than the rate authorized or for a greater annual amount than authorized by a permit, these rules, or other applicable law.

§ 5.5 Conveyed Water; Pipelines

All persons shall use reasonable diligence to convey water from the wellhead where produced to the place of use in order to prevent evaporation, channel loss by percolation, or waste. Water conveyed greater than a distance of one-half mile from the wellhead where produced must be conveyed through a pipeline.

§ 5.7 Permits Subject to Revocation

All permits granted by the District are based upon and contingent upon the accuracy of the information supplied by the applicant. A finding that false information has been supplied is grounds for immediate revocation of the permit.

§ 5.9 General Provisions Applicable To Withdrawals

(a) A valid Historic Use Production Permit or Non-Historic Use Production Permit is required to withdraw or produce groundwater from a non-exempt well.

(b) A permit confers only the right to use the permit under the provisions of these rules. The permit's terms may be modified or amended pursuant to the provisions of these rules.

(c) Withdrawal or production of groundwater from a non-exempt well must be measured by the owner or operator and reported to the District according to the requirements of Chapter 8 of these rules.

(d) All well sites must be accessible to District representatives for inspection, and any permittee agrees to cooperate fully in any reasonable inspection of the well and well site by the District representatives.

(e) The application for a permit or permit amendment shall be in writing and sworn to by the applicant.

(f) Within 30 days after the date of a change in ownership of a permit, the permittee must notify the District in writing of the name of the new owner. Any person who becomes the owner of a permit must, within 30 calendar days from the date of the change in ownership, file a notice of transfer of ownership or an application to amend the permit, as applicable.

(g) Violation of a permit's terms, conditions, requirements, or special provisions, including pumping, withdrawing, or producing groundwater in excess of the quantity authorized by a permit issued by the District, is a violation of these rules and is subject to enforcement action as provided by these rules and any applicable law.

(h) For any applications submitted to the District for which the applicant has requested that such applications be processed concurrently, the District may process and the Board may consider such applications concurrently according to the standards and rules applicable to each.

(i) Any increase in the volume of groundwater produced or in the rate of withdrawal from a well or wells, or change in the purpose of use or place of use of groundwater during the term of a permit issued by the District may not be made unless the Board has first approved a permit amendment authorizing the change.

Subchapter B. Groundwater Production Limitations

§ 5.101 Purpose

The purpose of this subchapter is to:

(a) establish the aggregate, annual volume of groundwater that may be produced from:

(1) exempt wells; and

(2) non-exempt wells that withdraw groundwater from the Trinity Aquifer or the Brazos River Alluvium Aquifer operating pursuant to Historic Use Production Permits and Non-Historic Use Production Permits;

(b) establish the procedures for implementing, if necessary, proportional adjustments to the volume of groundwater allowed to be produced in any given year pursuant to Historic Use Production Permits; and

(c) establish the procedures for implementing, if necessary, proportional adjustments to the volume of groundwater allowed to be produced in any given year pursuant to Non-Historic Use Production Permits.

§ 5.103 Groundwater Available for Production from the Trinity Aquifer

(a) The aggregate, annual volume of groundwater that may be produced from the Trinity Aquifer is based on combined withdrawals from:

(1) exempt wells, as estimated in the District's approved Groundwater Management Plan; and

(2) non-exempt wells operating pursuant to Historic Use Production Permits and Non-Historic Use Production Permits shall be no greater than the volume of Modeled Available Groundwater for the Trinity Aquifer (MAG Trinity), except as provided in Subsection (d), below.

(b) The estimated volume of groundwater from the Trinity Aquifer allotted for production from exempt wells shall equal that amount as stated in the District's approved Groundwater Management Plan, as may be amended ($Exempt_{Trinity}$) and shall include the amounts from exempt wells in both the Hensell and Hosston Management Zones.

(c) The volume of groundwater that may be produced from the Trinity Aquifer by non-exempt wells ($Non\text{-}Exempt_{Trinity}$) shall not exceed the volume of Modeled Available Groundwater for the Trinity Aquifer ($MAG_{Trinity}$) less the estimated volume of groundwater from the Trinity Aquifer allotted for production from exempt wells ($Non\text{-}Exempt_{Trinity} \leq MAG_{Trinity} - Exempt_{Trinity}$). This amount shall equal the combined volume of Modeled Available Groundwater for the Hensell Management Zone of the Trinity Aquifer ($MAG_{Trinity\ (Hensell)}$) and the volume of Modeled Available Groundwater for the Hosston Management Zone of the Trinity Aquifer

($MAG_{Trinity\ (Hosston)}$).

(d) The volume of groundwater that may be produced from the Hensell Management Zone by non-exempt wells ($Non\text{-}Exempt_{Trinity\ (Hensell)}$) shall not exceed the volume of Modeled Available Groundwater for the Hensell Management Zone ($MAG_{Trinity\ (Hensell)}$) less the estimated volume of groundwater from the Hensell Management Zone allotted for production from exempt wells ($Non\text{-}Exempt_{Trinity\ (Hensell)} \leq MAG_{Trinity\ (Hensell)} - Exempt_{Trinity\ (Hensell)}$).

(e) The volume of groundwater that may be produced from the Hosston Management Zone by non-exempt wells ($Non\text{-}Exempt_{Trinity\ (Hosston)}$) shall not exceed the volume of Modeled Available Groundwater for the Hosston Management Zone ($MAG_{Trinity\ (Hosston)}$) less the estimated volume of groundwater from the Hosston Management Zone allotted for production from exempt wells ($Non\text{-}Exempt_{Trinity\ (Hosston)} \leq MAG_{Trinity\ (Hosston)} - Exempt_{Trinity\ (Hosston)}$).

(f) Unless a lower production amount is deemed appropriate for a given applicant due to the factors identified in Section 5.211(a) below, each Historic Use Production Permit for the Trinity Aquifer shall initially authorize the permittee to produce his or her Maximum Historic Use (MHU). If, after all Historic Use Production Permit applications have been finally decided by the District, the aggregate of the annual volume of groundwater permitted for production pursuant to the Historic Use Production Permits exceeds the volume calculated in Subsection (c) above ($Non\text{-}Exempt_{Trinity}$), then the District shall, by written order no later than January 1, 2014, proportionally reduce the authorized production amount of each and every Historic Use Production Permit in order to equal the $Non\text{-}Exempt_{Trinity}$ amount, and such order shall effectively modify each Historic Use Production Permit.

(g) If after all Historic Use Production Permit applications have been finally decided by the District, the aggregate of the annual volume of groundwater authorized for production pursuant to Historic Use Production Permits from the Trinity Aquifer ($HUPP_{Trinity}$) is less than the volume calculated in Subsection (c) above for $Non\text{-}Exempt_{Trinity}$, then the District may grant Non-Historic Use Production Permits for the Trinity Aquifer ($NHUPP_{Trinity}$) in an aggregate annual volume equal to or less than the difference between the volume calculated in Subsection (c) above and the aggregate of the annual volume of groundwater authorized for production pursuant to Historic Use Production Permits for the Trinity Aquifer ($NHUPP_{Trinity} \leq Non\text{-}Exempt_{Trinity} - HUPP_{Trinity}$). No Non-Historic Use Production Permit applications shall be considered by the District until all Historic Use Production Permit applications have been finally decided by the District.

(h) If the aggregate of the annual volume of groundwater authorized for production pursuant to Historic Use Production Permits from the Hensell Management Zone ($HUPP_{Trinity\ (Hensell)}$) is less than the volume calculated in Subsection (c) above for the $Non\text{-}Exempt_{Trinity\ (Hensell)}$, then the District may grant Non-Historic Use Production Permits for the Hensell Management Zone ($NHUPP_{Trinity\ (Hensell)}$) in an aggregate annual volume equal to or less than the difference between the volume calculated in Subsection (c) above and the aggregate of the annual volume of groundwater authorized for production pursuant to Historic Use Production Permits from the Hensell Management Zone ($NHUPP_{Trinity\ (Hensell)} \leq Non\text{-}Exempt_{Trinity\ (Hensell)} - HUPP_{Trinity\ (Hensell)}$).

(i) If the aggregate of the annual volume of groundwater authorized for production pursuant to Historic Use Production Permits from the Hosston Management Zone ($HUPP_{Trinity\ (Hosston)}$) is less than the volume calculated in Subsection (c) above for the $Non\text{-}Exempt_{Trinity\ (Hosston)}$, then the District may grant Non-Historic Use Production Permits for the Hosston Management Zone ($NHUPP_{Trinity\ (Hensel)}$) in an aggregate annual volume equal to or less than the difference between the volume calculated in Subsection (c) above and the aggregate of the annual volume of groundwater authorized for production pursuant to Historic Use Production Permits from the Hosston Management Zone ($NHUPP_{Trinity\ (Hosston)} \leq Non\text{-}Exempt_{Trinity\ (Hosston)} - HUPP_{Trinity\ (Hosston)}$).(j) The aggregate of the annual volume of groundwater production permitted pursuant to Historic Use Production Permits and Non-Historic Use Production Permits, if any, is subject to additional proportional reduction by written order of the District as may be necessary in order to achieve the Modeled Available Groundwater, as it may be amended, or any Desired Future Condition of the Trinity Aquifer. If any additional proportional reduction is necessary, such reduction shall be first applied to Non-Historic Use Production Permits, even to the extent, if necessary, that Non-Historic Use Production Permits will be entirely voided, before any proportional reduction is made to Historic Use Production Permits.

(j) The aggregate of the annual volume of groundwater production permitted pursuant to Historic Use Production Permits and Non-Historic Use Production Permits, if any, is subject to additional proportional reduction by written order of the District as may be necessary in order to achieve the Modeled Available Groundwater, as it may be amended, or any Desired Future Condition of the Trinity Aquifer. If any additional proportional reduction is necessary, such reduction shall be first applied to Non-Historic Use Production Permits, even to the extent, if necessary, that Non-Historic Use Production Permits will be entirely voided, before any proportional reduction is made to Historic Use Production Permits.

§ 5.107 Groundwater Available for Production from the Brazos River Alluvium Aquifer

(a) The aggregate annual volume of groundwater that may be produced from the Brazos River Alluvium Aquifer from:

(1) exempt wells, as estimated in the District's approved Groundwater Management Plan; and

(2) non-exempt wells operating pursuant to Historic Use Production Permits and Non-Historic Use Production Permits shall be no greater than the volume of Modeled Available Groundwater for the Brazos River Alluvium Aquifer ($MAG_{Alluvium}$), except as provided in Subsection (d), below.

(b) The estimated volume of groundwater from the Brazos River Alluvium Aquifer allotted for production from exempt wells shall equal that amount as stated in the District's approved Groundwater Management Plan, as may be amended ($Exempt_{Alluvium}$).

(c) The volume of groundwater that may be produced from the Brazos River Alluvium Aquifer by non-exempt wells ($Non\text{-}Exempt_{Alluvium}$) shall not exceed the volume of Modeled Available Groundwater for the Brazos River Alluvium Aquifer ($MAG_{Alluvium}$) less the

estimated volume of groundwater from the Brazos River Alluvium Aquifer allotted for production from exempt wells ($Non\text{-}Exempt_{Alluvium} \leq MAG_{Alluvium} - Exempt_{Alluvium}$).

(d) Unless a lower production amount is deemed appropriate for a given applicant due to the factors identified in Section 5.211(a), below, each Historic Use Production Permit for the Brazos River Alluvium Aquifer shall initially authorize the permittee to produce his or her Maximum Historic Use (MHU). If, after all Historic Use Production Permit applications have been finally decided by the District, the aggregate of the annual volume of groundwater permitted for production pursuant to the Historic Use Production Permits exceeds the volume calculated in Subsection (c) above ($Non\text{-}Exempt_{Alluvium}$), then the District shall, by written order, proportionally reduce the authorized production amount of each and every Historic Use Production Permit in order to equal the $Non\text{-}Exempt_{Alluvium}$ amount, and such order shall effectively modify each Historic Use Production Permit.

(e) If, after all Historic Use Production Permit applications have been finally decided by the District, the aggregate of the annual volume of groundwater authorized for production pursuant to Historic Use Production Permits ($HUPP_{Alluvium}$) is less than the volume calculated in Subsection (c) above ($Non\text{-}Exempt_{Alluvium}$), then the District may grant Non-Historic Use Production Permits ($NHUPP_{Alluvium}$) in an aggregate annual volume equal or to less than the difference between the volume calculated in Subsection (c) above and the aggregate of the annual volume of groundwater authorized for production pursuant to Historic Use Production Permits ($NHUPP_{Alluvium} \leq Non\text{-}Exempt_{Alluvium} - HUPP_{Alluvium}$). No Non-Historic Use Production Permit applications shall be considered by the District until all Historic Use Production Permit applications have been finally decided by the District.

(f) The aggregate of the annual volume of groundwater production permitted pursuant to Historic Use Production Permits and Non-Historic Use Production Permits, if any, is subject to additional proportional reduction by written order of the District as may necessary in order to achieve the Modeled Available Groundwater, as it may be amended, or any Desired Future Condition of the Brazos River Alluvium Aquifer. If any additional proportional reduction is necessary, such reduction shall be first applied to Non-Historic Use Production Permits, even to the extent, if necessary, that Non-Historic Use Production Permits will be entirely voided, before any proportional reductions are made to Historic Use Production Permits.

Subchapter C. Groundwater Production Permits

§ 5.201 Types of Groundwater Production Permits

The District may issue the following types of groundwater production permits:

(1) Historic Use Production Permits (HUPPs); and

(2) Non-Historic Use Production Permits (NHUPPs).

Groundwater may not be produced from a non-exempt well within the District without holding a valid HUPP or NHUPP.

§ 5.203 Authorized Uses

As specifically designated in a groundwater production permit, a person may beneficially use groundwater withdrawn from the Aquifer for the following purposes of use:

(a) irrigation use; and

(b) municipal/industrial/other use.

§ 5.205 Filing Deadline for Applications for Historic Use Production Permits

In order to obtain an Historic Use Production Permit, the owner of a non-exempt well that was completed and operational prior to January 1, 2010, and that produced and used groundwater in any year during the Existing and Historic Use Period, was required to submit an application to the District for an Historic Use Production Permit by no later than 5:00 p.m., May 1, 2010. HUPP applications arriving at the District Office after that deadline will be returned to the applicant. Failure to file an application for a HUPP by 5:00 p.m. on May 1, 2010 shall preclude the well owner from making any future claim or application to the District for Historic Use of groundwater under these rules. Failure to file an application for a HUPP by 5:00 p.m. on May 1, 2010 for a well or wells shall preclude the owner or any operator from producing groundwater from the well or wells unless such owner or operator obtains a Non-Historic Use Production Permit, if available, converts the well to an exempt well or monitoring well, or obtains a transfer of production rights from the holder of a HUPP.

§ 5.207 Applications for Historic Use Production Permits (HUPPs)

All HUPP applicants must use the application form prescribed by the District and include all relevant information required by these rules. A single HUPP application may, at the applicant's discretion, be submitted for multiple wells owned or operated by the applicant. In addition to the information specified in § 9.107, an application for an Historic Use Production Permit shall contain the following:

(a) Name and Address of Owner. The full name, physical and mailing addresses, telephone number, fax number, and electronic mail address of the landowner and operator, as applicable.

(b) Source of Supply. A statement identifying which aquifer(s) is/are the source of groundwater from the well.

(c) Rate of Withdrawal. The maximum rate of withdrawal, in gallons per minute, that the well is capable of producing.

(d) Method of Withdrawal. A description of the method used to withdraw groundwater.

(e) Declaration of Historic Use. A declaration of the amount of groundwater claimed to have been used in each year of the Existing and Historic Use Period, identifying the total amount of groundwater that the applicant or his or her contract user or predecessor in interest, withdrew and beneficially used without waste, and, if applicable, the number of acres irrigated without waste, during each calendar year of the Existing and Historic Use Period, calculated in accordance with the following guidelines, as may be applicable:

(1) For an applicant whose use during the Existing and Historic Use Period has been affected by a requirement of, or participation in, the federal conservation program, a credit for Beneficial Use shall be given for the amount that would have been withdrawn and beneficially used during the Existing and Historic Use Period by such applicant but for the operation of the federal conservation program. The credit may be based on irrigation use on comparable acres on a similarly-situated farm that is not in the federal conservation program.

(2) If, during the Existing and Historic Use Period, more than one user applied groundwater for a Beneficial Use on the same land, then all such Beneficial Use shall inure solely to the benefit of and may only be claimed by the landowner who last withdrew and used the water or whose contract user last withdrew and used the water during the Existing and Historic Use Period.

(f) Purpose of Historic Use. The purpose(s) for which the groundwater was used during the Existing and Historic Use Period.

(g) Purpose of Future Use: The purpose(s) for which the groundwater will be used.

(h) Crop Type. For irrigation applications, the crop type and acreage of all crops irrigated during the Existing and Historic Use Period.

(i) Irrigated Acreage. For irrigation applications, the deed and legal description of irrigable land irrigated to produce an agricultural crop during the Existing and Historic Use Period, including the year irrigated.

(j) Ownership of Well Land: The deed and legal description for the tract of land on which the well is located.

(k) Federal Conservation Plan Documentation: For irrigation applications, where applicable, documentation regarding enrollment of each tract of land in the federal conservation program.

(l) Well locations: The number and location of each well owned by the applicant and for which the applicant claims groundwater was withdrawn and placed to Beneficial Use during the Existing and Historic Use Period.

(m) Place of Use: The place of use of groundwater withdrawn from each well, including, as applicable, a copy of the deed and legal description for the place of use or a copy of the map identifying the boundaries of the applicant's Certificate of Convenience and Necessity (CCN).

(n) Other Users: If the groundwater was withdrawn from the well or placed to a Beneficial Use by a contract user or predecessor in interest, then the name, address and telephone number of each contract user or predecessor in interest, and copies of the legal documents establishing the legal right of the contract user or predecessor in interest to withdraw and/or place groundwater from the well to Beneficial Use.

(o) Year Drilled: The year in which the well was drilled.

(p) Photograph: A photograph of the well taken approximately 100 feet from the wellhead.

(q) Well or Driller's Log: A copy of the State Well Report and, if available, any geophysical logs for the well.

(r) Plans: Any potable water supply entity shall provide a copy of its water conservation plan and drought contingency plan prepared for the TCEQ.

(s) Compliance with Management Plan: A declaration that the applicant will comply with the District's Groundwater Management Plan.

(t) Compliance with Rules: A declaration that the applicant is in compliance with all applicable District rules in effect since December 7, 2007, and will comply with the District rules.

(u) Surface Water Bodies: The name of any surface water, including lakes, streams, or rivers, within 1,000 feet of the well.

(v) Waste and Conservation: A statement that the applicant agrees to avoid waste and achieve water conservation.

(w) Groundwater Quality: A statement that the applicant agrees to use reasonable diligence to protect groundwater quality.

(x) Other Information: Any other information determined to be necessary by the District.

§ 5.211 Basis for Action on Historic Use Production Permit Applications

(a) The Board shall grant an application for an Historic Use Production Permit if the

Board finds that:

(1) the application is complete;

(2) the application was timely filed in accordance with Section 5.205;

(3) the application complies with the rules of the District;

(4) all applicable fees and deposits have been paid;

(5) the applicant owns the proposed or existing well and the place of use;

(6) the applicant has a legal right to produce groundwater from the proposed or existing well;

(7) the wellhead is, or will be physically located, within the boundaries of the District;

(8) the withdrawals are proposed to be placed to a Beneficial Use;

(9) except as provided in Section 5.401(b), the place of use is located within the District's boundaries, unless the applicant also has obtained or applied for a groundwater exportation permit from the District;

(10) the applicant is in compliance with any permits the applicant holds from the District and with District rules;

(11) the activities of the applicant constituting the purpose of use for which the groundwater will be beneficially used will be managed to preserve, protect, prevent the pollution, degradation, or harmful alteration of, control and prevent the waste of, prevent the escape of groundwater from, and achieve the conservation of groundwater in and produced from, the aquifer;

(12) the proposed production of water will not unreasonably affect existing groundwater or surface water resources or existing holders of permits issued by the District;

(13) operation of the well will not cause unreasonable interference between wells;

(14) the application is consistent with the District's certified groundwater management plan, as may be amended; and

(15) the applicant proves the Beneficial Use of groundwater without waste during the Existing and Historic Use Period.

(b) Aggregation of Withdrawals. The authorized withdrawal amount for a given Historic Use Production Permit may be aggregated with the authorized withdrawal amounts for other Historic Use Production Permits held by the same permittee. Where aggregated, the total authorized withdrawal amount will be assigned to the wells in aggregate, rather than allocating to

each well its pro-rata share of production.

(c) An Historic Use Production Permit issued by the District will initially authorize the permittee to produce his or her Maximum Historic Use (MHU), unless the District finds that a lower production amount is appropriate for a given applicant based upon the factors listed in Subsection (a), above. The initial production amount specified in an Historic Use Production Permit may subsequently be proportionally reduced by the District as provided in Subchapter B of this chapter.

(d) The Board shall not issue Historic Use Production Permits for lands for which the Board determines the applicant, his predecessor in interest, or a contract user did not beneficially use groundwater without waste during the Existing and Historic Use Period.

(e) The Board shall determine the volume of Maximum Historic Use (MHU) of groundwater by an applicant as follows:

(1) for irrigation purposes, it shall be the number of acres of Existing and Historic Irrigated Land proven to have been to have been irrigated during any one year of the Existing and Historic Use Period multiplied by 2.5 acre-feet per acre;

(2) for all other non-exempt uses, it shall be the maximum amount of groundwater proven to have been produced and beneficially used in a non-wasteful manner in any one calendar year during the Existing and Historic Use Period or for a municipal historical user within a certificate of convenience and necessity (CCN) who has less than one full year of use by some end users within the CCN, it shall be the maximum amount of groundwater proven to have been produced and beneficially used in a non-wasteful manner during part of the calendar year during the Existing and Historic Use Period calculated on an annualized basis; or

(3) for any land that was enrolled in the federal conservation program during the Existing and Historic Use Period, it shall be the number of acres of Existing and Historic Irrigated Land proven to have been land that was both irrigated for production prior to enrollment in the federal conservation program, and enrolled or participating in the program during any year in the Existing and Historic Use Period, multiplied by 2.5 acre-feet per acre.

(f) Existing and Historic Irrigated Land shall be classified by the District as the acres of land that are irrigable and which were irrigated to produce an agricultural crop during one or more years of the Existing and Historic Use Period.

(g) The following measures shall be used by the District to determine if land within the District's boundaries is irrigable:

(1) the land is classified by the United States Department of Agriculture Farm Services Agency as "cropland" that is land that is capable of being farmed with normal farming equipment and any other requirements of the Farm Services Agency;

(2) the land is classified by the United States Department of Agriculture Natural Resources Conservation Services as "Additional Farmland of Statewide Importance" according to the procedures of Part 657.5 Identification of Important Farmlands (7 CFR 657); or

(3) any other method or methods determined by the Board to reasonably determine if land is irrigable.

(h) One or more of the following measures may be used by the District to determine if land classified by the District as irrigable was irrigated to produce an agricultural crop during the Existing and Historic Use Period:

(1) crop production reports from a governmental agency that are determined by the District to contain sufficient information to identify:

(A) the location of the land on which the agricultural crop was produced;

(B) that an agricultural crop was produced on such land;

(C) that such land was irrigated to produce the agricultural crop; and

(D) the year or years that the agricultural crop was produced;

(2) aerial photographs or imagery that were produced by or obtained from an agency of the United States or the State of Texas and are determined by the District to be:

(A) of sufficient quality to accurately determine the location of the irrigated field;

(B) properly documented as to source and date when the photograph was taken; and

(C) of sufficient quality that the irrigated land shown in the photograph can be correlated by the District to a legal description of the land and the appraisal district property identification number associated with such land;

(3) crop production reports from any reasonable source that are determined by the District to contain sufficient information to identify:

(A) the location of the land on which the agricultural crop was produced;

(B) that an agricultural crop was produced on such land;

(C) that such land was irrigated to produce the agricultural crop; and

(D) the year or years that the agricultural crop was produced;

(4) aerial photographs or imagery that were produced by or obtained from any source and are determined by the District to be:

(A) of sufficient quality to accurately determine the location of the irrigated field;

(B) properly documented as to source and date when the photograph was taken; and

(C) of sufficient quality that the irrigated land shown in the photograph can be correlated by the District to a legal description of the land and the appraisal district property identification number associated with such land; and

(5) any other method or methods determined by the Board to reasonably determine if irrigable land has been irrigated.

§ 5.213 Contents of Historic Use Production Permits

(a) An Historic Use Production Permit issued by the District shall include the following terms and conditions:

(1) the name of the person or entity to whom the permit is issued;

(2) the date the permit is issued;

(3) the location of the well;

(4) the purpose of use for which the water produced from the well will be used;

(5) the specific location of the place of use of the water produced from the well;

(6) the aquifer and aquifer management zone, if applicable, from which withdrawals are authorized to be made;

(7) except as provided in Section 5.401(b), if the place of use is not within the District's boundaries, the permittee must obtain a groundwater exportation permit from the District prior to the withdrawal of groundwater under the permit;

(8) the requirements for the conveyance of water produced from the well to the place of use;

(9) the maximum rate of production in gpm, and any conditions relative thereto;

(10) the maximum amount of production in acre-feet per annum, specifying the authorized withdrawal amount by aquifer management zone, if applicable, and any conditions relative thereto;

(11) a water well closure plan or a declaration that the applicant will comply with well plugging requirements and report closure to the District and the Commission;

(12) metering and reporting requirements;

(13) a statement that the permit is subject to the Standard Permit Conditions set forth in Section 5.215 of these rules; and

(14) a statement that the permit is subject to limitation or modification as may be provided in the District rules or other applicable law; and

(15) other terms and conditions as may be required by the Board.

(b) Within 30 days of issuance, an Historic Use Production Permit shall be recorded with the Clerk of every county in which the well or wells or place of use are located and a copy shall be provided to the District.

§ 5.215 Standard Permit Conditions for Historic Use Production Permits

All Historic Use Production Permits issued by the District shall be subject to the following conditions:

(a) the duty to beneficially use and avoid waste of groundwater;

(b) the duty to conserve water in accordance with applicable law, and comply with the District's water conservation plan, as may be amended from time to time, and the permittee's plan approved by the District, as applicable;

(c) the duty to properly close (cap or plug) all wells in accordance with applicable law, and comply with the District's well closure plan, if any, as may be amended from time to time, and the permittee's plan approved by the District, as applicable;

(d) the duty to file all applicable reports with the District, and other appropriate federal, state, or local governments;

(e) the duty to reduce water production or consumption during times of drought in accordance with applicable law, and to comply with the District's drought management plan, as may be amended from time to time, and the permittee's plan approved by the District, as applicable;

(f) the duty to comply with the District's certified groundwater management plan, as may be amended from time to time;

(g) the duty to use diligence to protect groundwater quality within the District;

(h) the duty to comply with the District rules, as may be amended;

(i) any permit review, renewal, or extension conditions;

(j) the duty to locate all wells, and confirm the actual location with the proposed location in the application or as provided for in the permit, consistent with the District's well spacing rules, prior to the production from any wells identified in the permit or application;

(k) the continuing right of the District to supervise and manage groundwater

production and protect the aquifer;

(l) the duty to install, equip, operate, maintain, and close all wells in accordance with the District rules, and other applicable federal, state, and local law;

(m) the duty to comply with the District rules relating to transfers and amendments of permits;

(n) the duty to pay and be current in the payment of all applicable fees;

(o) the duty not to export groundwater from a well within the District's boundaries to a place of use outside the District's boundaries without a Groundwater Exportation Permit issued by the District;

(p) the duty to give notice to the District of any changes in name, address, or telephone number of the permittee, or the authorized representative, as applicable, in accordance with these rules;

(q) the duty to comply with all of the terms and conditions of the permit;

(r) the duty to ensure that the well site is accessible to District representatives for inspection, and to cooperate fully in any reasonable inspection of the well and well site by District representatives;

(s) the right of the District to enter land under § 36.123, Texas Water Code, as may be amended;

(t) the duty to comply with the metering and reporting requirements set forth in Chapter 8 of these rules;

(u) the duty to comply with any proportional adjustments mandated by Subchapter B of Chapter 5 of these rules; and

(v) any other conditions as the Board may deem appropriate.

§ 5.217 Groundwater Production in Violation of Historic Use Production Permit Prohibited

No holder of a Historic Use Production Permit may withdraw or use groundwater in a manner inconsistent with the terms of the permit, and any such production is illegal, wasteful per se, and a nuisance.

§ 5.219 Transfer of Ownership or Lease of Historic Use Production Permit; Notice

(a) The ownership of a Historic Use Production Permit may be transferred separately from the ownership of the place of use.

(b) Within 30 days after transfer of the ownership of a Historic Use Production Permit, or lease of the right to withdraw groundwater thereunder, the transferee shall file with the

District a notice on a form prescribed by the District. For transfers of ownership, if the notice is complete, and the transfer is otherwise in compliance with this subchapter, the general manager shall reflect the new ownership and issue an amended permit to the transferor, transferee, or both, as may be appropriate. For leases, the general manager will update the District's permit records to reflect the lease.

§ 5.221 Historic Use Production Permit Transfers and Amendments; Applications

(a) The District may amend a Historic Use Production Permit as to the following:

(1) point of withdrawal;

(2) place of use;

(3) the total volume of groundwater authorized to be withdrawn in acre-feet per annum by aquifer management zone, if applicable;

(4) rate of production in gpm; or

(5) ownership in accordance with Section 5.219.

(b) Any person seeking to amend their permit as provided in Subsection (a)(1)-(4) must first file with the District an application to amend on a form prescribed by the District.

(c) No permit transfer or amendment is effective until the transfer or amendment has been approved by the Board.

(d) A permit amendment may not authorize the withdrawal of groundwater from a different aquifer management zone than that authorized in the transferor's Historic Use Production Permit.

(e) An amendment to a Historic Use Production Permit to increase the authorized withdrawal amount may only be made based on the transfer of Historic Use Production Permit withdrawal amounts from another Historic Use Production Permit.

§ 5.223 Basis for Granting Applications to Amend Historic Use Production Permits

The Board shall grant an application to amend a Historic Use Production Permit if it finds that:

(1) the elements provided for in §§ 5.207, 5.211 and 5.221 are established; and

(2) during the term of the permit, the applicant, transferor, or transferee, as may be appropriate, demonstrates a positive compliance history with the permit's terms and conditions, and the District rules.

§ 5.225 Availability of and Application for Non-Historic Use Production Permits

(a) If, pursuant to Subchapter B of this chapter, the District determines that there is

sufficient groundwater available for the District to issue Non-Historic Use Production Permits in a given aquifer, and given aquifer management zone, if applicable, then the Board will issue a written order authorizing the filing and processing of applications for Non-Historic Use Production Permits for the applicable aquifer and aquifer management zone, if applicable (an "NHUPP Authorization Order"). The District will not accept for filing any NHUPP application for a given aquifer unless and until such an NHUPP Authorization Order has been issued by the Board for that aquifer.

(b) If the District issues an NHUPP Authorization Order for a given aquifer and given aquifer management zone, if applicable, then no groundwater may be produced from that aquifer and aquifer management zone, if applicable, from a non-exempt well for which there is not an associated Historic Use Production Permit without first applying for and obtaining a Non-Historic Use Production Permit. On the other hand, if, pursuant to Subchapter B of Chapter 5 of these rules, the District determines that there is not sufficient groundwater available for the District to issue Non-Historic Use Production Permits in a given aquifer and given aquifer management zone, if applicable, then no groundwater may be produced from a non-exempt well for which there is not an associated Historic Use Production Permit.

§ 5.227 Applications for Non-Historic Use Production Permits (NHUPP)

(a) If NHUPPs may be applied for, an NHUPP applicant must use the application form prescribed by the District and include all relevant information required by these rules. A single NHUPP application may, at the applicant's discretion, be submitted for multiple wells owned or operated by the applicant. In addition to the information specified in § 9.107, an application for an NHUPP application shall contain the following:

(1) Name and Address of Owner: The full name, physical and mailing addresses, telephone number, fax number, and electronic mail address of the landowner and operator, as applicable.

(2) Source of Supply: A statement identifying which aquifer(s) and aquifer management zone, if applicable, is/are the source of groundwater from the well.

(3) Rate of Withdrawal: The maximum rate of withdrawal in gallons per minute or cubic feet per second that the well is capable of producing.

(4) Method of Withdrawal: A description of the method used to withdraw groundwater.

(5) Declaration of Amount of Proposed Use. A declaration by the applicant of the volume of groundwater that is proposed to be used without waste for a beneficial purpose and detailed documentation showing the need for the proposed amount of use.

(6) Purpose of Use: The purpose(s) for which the groundwater will be used and the dates by which water will be needed for any specific projects, if applicable.

(7) Ownership of Land: The deed and legal description for the tract of land on

which the well is or will be located.

(8) Information regarding availability, access to, and cost to obtain water from a source other than the aquifer identified by the applicant. Information regarding such other sources shall at a minimum include the availability of, access to, and cost to obtain surface water.

(9) Well location: The location of the well or proposed well.

(10) Place of Use: The place of use of groundwater to be withdrawn from the well.

(11) Year Drilled: The year in which the well was or will be drilled.

(12) Well or Driller's Log: A copy of any State well report and, if applicable, any geophysical log for the well.

(13) Plans: Any potable water supply entity shall provide a copy of its water conservation plan and drought contingency plan prepared for the Commission.

(14) Compliance with Management Plan: A declaration that the applicant will comply with the District's management plan.

(15) Compliance with Rules: A declaration that the applicant is in compliance with all applicable District rules in effect on or after December 7, 2007, and will comply with the District rules.

(16) Surface Water Bodies: The name of any surface water, including lakes, streams, or rivers, within 1,000 feet of the well.

(17) Waste and Conservation: A statement that the applicant agrees to avoid waste and achieve water conservation.

(18) Groundwater Quality: A statement that the applicant agrees to use reasonable diligence to protect groundwater quality.

(19) Other Information: Any other information determined to be necessary by the District.

(b) All applicants for an NHUPP for municipal use shall also include a report prepared by an engineer licensed in the State of Texas that provides the details and methods used to determine:

(1) the applicant's monthly and annual water use on a per meter and per capita basis for the previous 10 years;

(2) the estimated future water needs of the applicant;

(3) the applicant's billing amounts, rate structure, and billing efficiency;

(4) the estimate of water lost through leaks, unmetered connections, and any other loss;

(5) the water conservation methods implemented during the previous 10 years and the methods planned for implementation in the next 10 years;

(6) the economic analysis of using surface water or conservation methods to avoid the need for increased groundwater use; and

(7) the economic analysis of using groundwater from the Brazos River Alluvium Aquifer or other groundwater sources to avoid the need for increased groundwater use from the Trinity Aquifer.

(c) All applicants for an NHUPP for industrial use shall also include a detailed report prepared by an engineer licensed in the State of Texas that includes:

(1) the applicant's monthly and annual water use for the previous 10 years;

(2) the estimated future water needs of the applicant;

(3) the amount of water used per unit of production and referenced to the typical amount of water used in the industry per unit of production (gallons per pound, gallons per item, gallons per unit processed, etc.);

(4) an estimate of water lost through leaks, unmetered uses, and any other loss;

(5) the water conservation methods implemented during the previous 10 years and those methods planned for implementation in the next 10 years;

(6) an economic analysis of using surface water or conservation methods to avoid the need for increased groundwater; and

(7) an economic analysis of using groundwater from the Brazos River Alluvium Aquifer or other groundwater sources to avoid the need for increased groundwater use from the Trinity Aquifer.

(d) All applicants for an NHUPP for agricultural, irrigation, recreational, or wildlife use shall also include a report prepared by an engineer licensed in the State of Texas or the United States Department of Agriculture Natural Resources Conservation Service that includes:

(1) the estimated future water needs of the applicant;

(2) the amount of water used per unit of production (acre-feet per acre of crop, gallons per animal, acre-feet per acre of pond water surface, etc.);

(3) the amount of water lost through evaporation, seepage, or runoff;

(4) the amount of on-site surface water or rainfall usable for meeting proposed demands;

(5) the amount of groundwater need during a year with average rainfall and during a year with extreme drought (drought of record);

(6) an estimate of water lost through leaks, unmetered uses, and any other loss;

(7) the water conservation methods implemented during the previous 10 years and the methods planned for implementation in the next 10 years;

(8) an economic analysis of using surface water or conservation methods to avoid the need for increased groundwater; and

(9) an economic analysis of using groundwater from the Brazos River Alluvium Aquifer or other groundwater sources to avoid the need for increased groundwater use from the Trinity Aquifer.

(e) All applicants for an NHUPP for any other use not defined in Subsections (b), (c) and (d), shall submit additional information determined by the Board based on the proposed use of groundwater.

§ 5.229 Basis for Action on Non-Historic Use Production Permit Applications

(a) The Board shall grant an application for an Non-Historic Use Production Permit if the Board finds that:

(1) the application is complete;

(2) the application complies with the rules of the District;

(3) all applicable fees and deposits have been paid;

(4) the applicant owns the proposed or existing well;

(5) the applicant has a legal right to produce groundwater from the proposed or existing well;

(6) the wellhead is, or will be physically located, within the boundaries of the District;

(7) the withdrawals are proposed to be placed to an actual beneficial use;

(8) except as provided in Section 5.401(b), the place of use is located within the District's boundaries, unless the applicant also has obtained or applied for a groundwater exportation permit from the District;

(9) there are no economically feasible alternative sources of water available;

(10) there is a sufficient volume of water available pursuant to Chapter 5, Subchapter B of these rules to satisfy the applicant's intended purpose of use for the term of the permit;

(11) no other pending applications compliant with the rules, and essential to support domestic use, will be denied, in whole or in part, as the result of granting the application;

(12) the withdrawal amount requested will be physically withdrawn and put to beneficial use within three years of the date the application was filed;

(13) the activities of the applicant will be managed to preserve, protect, prevent the pollution, degradation, or harmful alteration of, control and prevent the waste of, prevent the escape of groundwater from, and achieve the conservation of groundwater in and produced from, the aquifer;

(14) the proposed production of water will not unreasonably affect existing groundwater or surface water resources or existing holders of permits issued by the District or exceed the MAG;

(15) operation of the well will not cause unreasonable interference between wells;

(16) the applicant is in compliance with any permits the applicant holds from the District and with District rules; and

(17) the application is consistent with the District's certified groundwater management plan, as may be amended.

(b) Aggregation of Withdrawals. The authorized withdrawal amount for a given Non-Historic Use Production Permit may be aggregated with the authorized withdrawal amounts for other Non-Historic Use Production Permits held by the same permittee. Where aggregated, the total authorized withdrawal amount will be assigned to the wells in aggregate, rather than allocating to each well its pro-rata share of production.

(c) The initial production amount specified in a Non-Historic Use Production Permit may subsequently be proportionally reduced, even to the extent that it is entirely voided, by the District as provided in Subchapter B of this Chapter.

§ 5.231 Contents of Non-Historic Use Production Permits

(a) A Non-Historic Use Production Permit issued by the District shall include the following terms and conditions:

(1) the name of the person or entity to whom the permit is issued;

(2) the date the permit is issued;

(3) the location of the well;

(4) the purpose of use for which the water produced from the well will be used;

(5) the specific location of the place of use of the water produced from the well;

(6) except as provided in Section 5.401(b), if the place of use is not within the District's boundaries, the permittee must obtain a groundwater exportation permit from the District prior to the withdrawal of groundwater under the permit;

(7) the requirements for the conveyance of water produced from the well to the place of use;

(8) the maximum rate of production in gpm, and any conditions relative thereto;

(9) the maximum amount of production in acre-feet per annum, and any conditions relative thereto;

(10) a water well closure plan or a declaration that the applicant will comply with well plugging requirements and report closure to the District and the Commission;

(11) metering and reporting requirements;

(12) requirement that withdrawals from the same point or points of withdrawal and purpose of use permitted in a Historic Use Production Permit be allocated first to the authorized annual withdrawal amount of a Historic Use Production Permit before being allocated to a Non-Historic Use Production Permit;

(13) a statement that the permit is subject to the Standard Permit Conditions set forth in Section 5.233 of these rules;

(14) a statement that the permit is subject to limitation or modification as may be provided in the District rules or other applicable law; and

(15) any other terms and conditions as may be required by the Board.

(b) Within 30 days of issuance, the District, on behalf of the permit holder, will file a Non-Historic Use Production Permit for recordation in the deed records of every county in which the well or wells or place of use are located and a copy shall be provided to the permit holder. The permit holder is responsible for payment of these recording costs.

§ 5.233 Standard Permit Conditions for Non-Historic Use Production Permits

Any Non-Historic Use Production Permit issued by the District shall be subject to the following conditions:

(a) the duty to beneficially use and avoid waste of groundwater;

(b) the duty to conserve water in accordance with applicable law, and comply with the District's water conservation plan, as may be amended from time to time, and the permittee's plan approved by the District, as applicable;

(c) the duty to properly close (cap or plug) all wells in accordance with applicable law, and comply with the District's well closure plan, if any, as may be amended from time to time, and the permittee's plan approved by the District, as applicable;

(d) the duty to file all applicable reports with the District, and other appropriate federal, state, or local governments;

(e) the duty to reduce water or production or consumption during times of drought in accordance with applicable law, and comply with the District's drought management plan, as may be amended from time to time, and the permittee's plan approved by the District, as applicable;

(f) the duty to comply with the District's certified groundwater management plan, as may be amended from time to time;

(g) the duty to use diligence to protect the groundwater quality within the District;

(h) the duty to comply with the District rules, as may be amended;

(i) any permit review, renewal, or extension conditions;

(j) the duty to locate all wells, and confirm the actual location with the proposed location in the application or as provided for in the permit, consistent with the District's well spacing rules, prior to the production from any wells identified in the permit or application;

(k) the continuing right of the District to supervise and manage groundwater production and protect the aquifer;

(l) the duty to install, equip, operate, maintain, and close all wells in accordance with the District rules, and other applicable federal, state, and local law;

(m) the duty to comply with the District rules relating to transfers and amendments of permits;

(n) the duty to pay and be current in the payment of all applicable fees;

(o) except as provided in Section 5.401(b), the duty not to export groundwater from a well within the District's boundaries to a place of use outside the District's boundaries without a groundwater exportation permit issued by the District;

(p) the duty to give notice to the District of any changes in name, address, or telephone number of the permittee, or the authorized representative, as applicable, in accordance with these rules;

(q) the duty to comply with all of the terms and conditions of the permit;

(r) the duty to ensure that the well site is accessible to District representatives for inspection, and to cooperate fully in any reasonable inspection of the well and well site by District representatives;

(s) the right of the District to enter land under § 36.123, Texas Water Code, as may be amended;

(t) the duty to comply with the metering and reporting requirements set forth in Chapter 8 of these rules;

(u) the duty to comply with any proportional adjustments mandated by Subchapter B of Chapter 5; and

(v) any other conditions as the Board may deem appropriate.

§ 5.235 Reduction in Amount or Cancellation of Non-Historic Use Production Permit for Non-Use

(a) If all or part of the water authorized to be produced under a Non-Historic Use Production Permit has not been put to Beneficial Use at any time during between the time the permit is issued and three years thereafter, then the permit is subject to cancellation by the District in whole or a reduction in the annual volume of production authorized by the permit.

(b) Prior to any cancellation or reduction, the District shall provide the opportunity for a hearing and give notice to the permittee at least 30 days before the date of the hearing.

(c) The District shall also have the notice of the hearing published once a week for two consecutive weeks, at least 30 days before the date of the hearing, in a newspaper published in each county in which diversion of water from the source of supply was authorized or proposed to be made and in each county in which the water was authorized or proposed to be used, as shown by the records of the District. If in any such county no newspaper is published, then the notice may be published in a newspaper having general circulation in the county.

(d) The District shall hold a hearing and shall give the permittee and other interested persons an opportunity to be heard and to present evidence on any matter pertinent to the questions at issue.

(e) At the conclusion of the hearing, the District may cancel the permit in whole or in part to the extent that it finds that:

(1) the water or any portion of the water authorized to be produced under the permit has not been put to a Beneficial Use during the 3-year period; and

(2) the permittee has not used reasonable diligence in applying the water or the unused portion of the water to an authorized Beneficial Use or is otherwise unjustified in the nonuse.

§ 5.237 Groundwater Production in Violation of Non-Historic Use Production Permit Prohibited

No holder of a Non-Historic Use Production Permit may withdraw or use groundwater in a manner inconsistent with the terms of the permit, and any such production is illegal, wasteful per se, and a nuisance.

§ 5.239 Transfer of Ownership or Permittee of Non-Historic Use Production Permit; Notice

(a) The ownership or authorized permittee of a Non-Historic Use Production Permit may not be transferred separately from the ownership of the place of use or points of withdrawal for a permit for municipal use with a certificate of convenience and necessity (CCN).

(b) Within 30 days after transfer of the ownership of a Non-Historic Use Production Permit, the transferee shall file with the District a notice on a form prescribed by the District. If the notice is complete, and the transfer is otherwise in compliance with this subchapter, the general manager shall reflect the new ownership and issue an amended permit to the transferee, as appropriate.

§ 5.241 Non-Historic Use Production Permit Transfers and Amendments; Applications

(a) The District may amend a Non-Historic Use Production Permit as to the following:

(1) point of withdrawal;

(2) place of use;

(3) the total volume of groundwater authorized to be withdrawn in acre-feet per annum by aquifer management zone, if applicable;

(4) rate of production in gpm; or

(5) ownership in accordance with Section 5.239.

(b) Any person seeking to amend their permit as provided in Subsection (a)(1)-(4) must first file with the District an application to amend on a form prescribed by the District.

(c) No permit transfer or amendment is effective until the transfer or amendment has been approved by the Board.

(d) A permit amendment may not authorize the withdrawal of groundwater from a different aquifer management zone than that authorized in the transferor's Non-Historic Use Production Permit.

(e) An amendment to a Non-Historic Use Production Permit to increase the

authorized withdrawal amount must comply with Sections 5.225 and 5.227 applicable to new applications for a Non-Historic Use Production Permit and shall be granted only in accordance with Section 5.229.

§ 5.243 Basis for Granting Applications to Amend Non-Historic Use Production Permits

The Board shall grant an application to amend a Non-Historic Use Production Permit if it finds that:

(a) the elements provided for in § 5.229 are established; and

(b) during the term of the permit, the applicant, transferor, or transferee, as may be appropriate, demonstrates a positive compliance history with the permit's terms and conditions, and the District rules.

Subchapter D. Groundwater Exportation Permits

§ 5.401 Applicability

(a) Except as provided in Subsection (b), this subchapter applies to any person who seeks to export groundwater that is produced from a well within the District's boundaries to a place of use outside the District's boundaries.

(b) This subchapter does not apply to:

(1) a groundwater export arrangement in effect prior to January 7, 2010, and continuing thereafter, so long as there is no increase in the annual amount exported after January 7, 2010;

(2) groundwater that is incorporated into a finished, manufactured product within the District and then exported for sale outside of the District;

(3) groundwater that is produced from a well located within the District, where the well is situated on a contiguous tract of land that straddles the District's boundaries and the groundwater is placed to use solely on that tract, but including portions outside the District's boundaries; or

(4) groundwater that is produced from a non-exempt well located within the District and delivered by the permittee to end users pursuant to a certificate of convenience and necessity (CCN), where: the CCN boundaries straddle the District boundaries.

§ 5.403 Groundwater Exportation Permit Required

(a) Exporting groundwater from the District without a required groundwater exportation permit is illegal, wasteful per se, and a nuisance.

(b) Any person seeking to export groundwater to a place of use outside of the District's boundaries is required to first file with the District an application to export groundwater on a form prescribed by the District and obtain a groundwater exportation permit from the District.

(c) An application filed to comply with this section shall be considered and processed under the same procedures as other applications for other permits and may be combined with applications filed to obtain a permit for in-District water use from the same applicant, if any.

(d) The District may not deny a permit under this subchapter based on the fact that the applicant seeks to export groundwater outside of the boundaries of the District, but may restrict a groundwater exportation permit to the annual production of groundwater and the purpose of use allowed under the associated groundwater production permit.

§ 5.405 Applications for Groundwater Exportation Permits

In addition to the information specified in § 9.107, an application for a groundwater

exportation permit shall contain information reasonably related to the information to be contained in a groundwater exportation permit under §§ 5.413 and 5.417 and the elements to be considered by the Board in determining whether to grant or deny the application under § 5.407. The application shall be submitted on the form developed and prescribed by the District.

§ 5.407 Basis for Action on Groundwater Exportation Permit Applications

The Board shall grant an application for a groundwater exportation permit if the Board finds that:

(a) the application is complete;

(b) the application complies with the rules of the District;

(c) all applicable fees and deposits have been paid;

(d) the water to be exported is proposed to be placed to a Beneficial Use;

(e) the place of use is identified specifically and located outside the District's boundaries;

(f) the well to be used for the proposed exportation project is identified specifically and located within the District's boundaries;

(g) the applicant is in compliance with any permits the applicant holds from the District and with the District rules;

(h) the applicant owns a groundwater production permit issued by the District to produce the groundwater necessary for the proposed exportation project, or has a contract to purchase the groundwater from a third party who holds such permit or other authorization;

(i) there is insufficient water available in the proposed receiving area to substantially meet the actual or projected demand during the proposed term of the groundwater exportation permit;

(j) there is sufficient water available within the District to substantially meet the actual or projected demand during the proposed term of the groundwater exportation permit;

(k) the proposed exportation will not have an unreasonably adverse effect on aquifer conditions, depletion, or water quality within the District;

(l) the proposed exportation will not have an unreasonably adverse effect on existing permittees, or other groundwater users within the District;

(m) the proposed exportation is consistent with the applicable Regional Water Plans approved by the Texas Water Development Board; and

(n) the proposed exportation is consistent with the District's certified Groundwater Management Plan, as may be amended.

§ 5.411 Groundwater Exportation Permit Term; Renewal

(a) The permit term for an exportation permit shall be set by the Board, consistent with the following criteria:

(1) the permit term shall be three years, if construction of a conveyance system in the District's boundaries has not been initiated prior to the issuance of the permit; or

(2) the permit term shall be 30 years, if construction of a conveyance system has been initiated in the District's boundaries prior to the issuance of the permit.

(b) The three-year term specified in Subsection (a)(1) shall automatically be extended to thirty years if construction of a conveyance system is begun before the expiration of the three-year period. For the purposes of this section, construction of a conveyance system shall be considered to have been initiated when the permittee has completed construction of at least 10% of the portion of the conveyance facilities located within the District that will be used to convey the maximum annual quantity of groundwater permitted for transfer outside of the boundaries of the District. Such portion of the conveyance facilities does not include any existing or previously constructed facilities that were not constructed specifically for use in exporting the groundwater considered under the permittee's groundwater exportation permit application.

(c) An exportation permit may be renewed. Any person seeking the renewal of a groundwater exportation permit must file with the District an application to renew on a form prescribed by the District. The application must be filed with the District no later than one year prior to the expiration of the permit term.

§ 5.413 Contents of Groundwater Exportation Permits

A groundwater exportation permit shall include the following terms and conditions:

(a) the name, address, and telephone number of the permittee;

(b) the groundwater production permit number to be tied to the groundwater exportation permit;

(c) if the permittee does not own the well(s) from which the production for exportation is made, then the name, address and telephone number of the well owner;

(d) if not the permittee, the name, address and telephone number of the owner of the land on which the well(s) is located;

(e) the permit term, including dates of issuance, effectiveness, and termination;

(f) the purpose of use for which the water produced from the well(s) is to be used;

(g) a requirement that the water produced under the permit be put to Beneficial Use without waste;

(h) the location of the place of use outside the District's boundaries;

(i) the maximum amount of production in acre-feet per annum that may be exported from the District, which will be limited to the amount that could be produced by the well(s) for in-District use pursuant to the production limitations set forth in these rules, and any conditions or restrictions relative thereto;

(j) the metering and reporting requirements; and

(k) other terms and conditions as may be required by the Board.

§ 5.417 Standard Permit Conditions for Groundwater Exportation Permits

All groundwater exportation permits shall be issued with and subject to the following conditions:

(a) the duty to beneficially use water and avoid waste;

(b) the duty to conserve water in accordance with applicable law and, if applicable, comply with the permittee's water conservation plan and the District's water conservation plan, as may be amended;

(c) the duty to file all applicable reports with the District and other appropriate federal, state, or local governments;

(d) the duty to reduce water consumption during times of drought in accordance with applicable law, and comply with either the District's drought management plan, as may be amended from time to time, or the permittee's plan approved by the District, as appropriate;

(e) the District's certified groundwater management plan, as may be amended from time to time;

(f) the duty to use all reasonable diligence to protect the groundwater quality of the aquifer;

(g) the duty to comply with the District rules as may be amended from time to time;

(h) permit review, renewal, or extension conditions;

(i) the continuing right of the District to supervise the depletion of the aquifer;

(j) installation, equipping, operation, and maintenance of all meters in accordance with the District rules;

(k) the duty to comply with the District rules relating to transfers and amendments of permits as may be amended from time to time;

(l) the duty to pay and be current in the payment of all applicable fees;

(m) the duty to record the permit;

(n) the duty to give notice to the District of any changes in name, address, or telephone number of the permittee, or the authorized representative, or the landowner, as may be appropriate;

(o) the duty to comply with all of the terms and conditions of the permit;

(p) the duty to ensure that the well site is accessible to District representatives for inspection, and to cooperate fully in any reasonable inspection of the well and well site by District representatives;

(q) the right of the District to enter land under § 36.123, Texas Water Code, as may be amended; and

(r) any other conditions as the Board may deem appropriate.

§ 5.419 Groundwater Production in Violation of Permit Prohibited

No holder of a groundwater exportation permit may export groundwater in a manner inconsistent with the terms of the permit, and any such production is illegal, wasteful per se, and a nuisance.

§ 5.421 Transfer of Ownership or Lease; Notice

(a) The ownership of a groundwater exportation permit may be transferred separately from the ownership of the place of use. The owner of a groundwater exportation permit may authorize a person other than the permittee to export groundwater under the permit.

(b) Within 30 days after transfer of the ownership of a groundwater exportation permit, or lease of the right to export thereunder, the transferee shall file with the District a notice on a form prescribed by the District. For transfers of ownership, if the notice is complete, and the transfer is otherwise in compliance with this subchapter, the general manager shall reflect the new ownership and issue an amended permit to the transferor, transferee, or both, as may be appropriate. For leases, the general manager will update the District's permit records to reflect the lease.

§ 5.423 Permit Transfers and Amendments; Applications

(a) The District may amend a groundwater exportation permit as to the following:

(1) point of withdrawal;

(2) place of use;

(3) the total volume of groundwater exported in acre-feet per annum;

(4) rate of production in gpm; or

(5) ownership in accordance with Section 5.421.

(b) Any person seeking to amend their permit as provided in Subsection (a)(1)-(4) must first file with the District an application to amend on a form prescribed by the District.

(c) No permit transfer or amendment is effective until the transfer or amendment has been approved by the Board.

(d) An amendment to a groundwater exportation permit to increase the authorized exportation amount must comply with Section 5.405 applicable to new applications for a groundwater exportation permit and shall be granted only in accordance with Section 5.407.

§ 5.425 Basis for Granting Applications to Amend Groundwater Exportation Permits

The Board shall grant an application to amend a groundwater exportation permit if it finds that:

(a) the elements provided for in § 5.407 are established; and

(b) during the term of the permit, the applicant, transferor, or transferee, as may be appropriate, demonstrates a positive compliance history with the permit's terms and conditions, and the District rules.

Subchapter E. Wells Exempt from Permits

§ 5.501 Exempt Wells

(a) The owner and/or operator of any of the following types of wells is exempt from the duty to obtain a drilling permit or groundwater withdrawal permit for the well:

(1) a well that was in use prior to the effective date of these rules, that is used solely for domestic use, and that was drilled, completed, or equipped so that it is incapable of producing more than 25,000 gallons of groundwater per day;

(2) a well on a tract of land larger than 10 acres if the well is drilled, completed, or equipped so that it is incapable of producing more than 25,000 gallons of groundwater a day and if the water produced or to be produced from the well is used or to be used solely for domestic use or to provide water for livestock or poultry;

(3) a well to supply water solely for a drilling rig that is actively engaged in drilling or exploration operations permitted by the Railroad Commission of Texas if:

(A) the person holding the Commission permit is responsible for the water well; and

(B) the water well is located:

(i) on the lease on which the drilling rig is located;

(ii) within the boundaries of the field in which the drilling rig is located; or

(iii) in close proximity to the drilling rig; or

(4) a well authorized under a permit issued by the Railroad Commission of Texas under Chapter 134, Natural Resources Code; or

(5) a well completed and capable of withdrawing water solely from the Brazos River Alluvium Aquifer if the water produced or to be produced from the well is used or to be used solely for domestic use or to provide water for livestock or poultry, and the well is:

(A) on a tract of land that is less than 2 acres and the well is drilled, completed, or equipped to be incapable of producing more than 2,500 gallons of groundwater a day;

(B) on a tract of land that is 2 acres or more in size but less than 5 acres and the well is drilled, completed, or equipped to be incapable of producing more than 5,000 gallons of groundwater a day;

(C) on a tract of land that is 5 acres or more in size but less than 7 acres and the well is drilled, completed, or equipped to be incapable of producing more than 12,000 gallons of groundwater a day; or

(D) on a tract of land that is 7 acres or more in size but less than 10 acres and the well is drilled, completed, or equipped to be incapable of producing more than 17,000 gallons of groundwater a day;

(6) a dewatering well; or

(7) a monitoring well.

(b) The owner and/or operator of a well completed and capable of withdrawing water solely from the Trinity Aquifer is exempt from the duty to obtain a groundwater withdrawal permit for the well if the water produced or to be produced from the well is used or to be used solely for domestic use or to provide water for livestock or poultry, there is no public water supply available to the tract of land, and the well is:

(1) on a tract of land that is less than 2 acres in size and the well is drilled, completed, or equipped to be incapable of producing more than 1,000 gallons of groundwater a day;

(2) on a tract of land that is more than 2 acres in size but less than 5 acres and the well is drilled, completed, or equipped to be incapable of producing more than 2,000 gallons of groundwater a day;

(3) on a tract of land that is 5 acres or more in size but less than 7 acres and the well is drilled, completed, or equipped to be incapable of producing more than 4,000 gallons of groundwater a day; or

(4) on a tract of land that is 7 acres or more in size but less than 10 acres and the well is drilled, completed, or equipped to be incapable of producing more than 6,000 gallons of groundwater a day.

(c) Notwithstanding Subsection (a) or (b), the District may require a well to be permitted pursuant to these rules if any of the applicable criteria in Section 36.117(d), Texas Water Code, are satisfied.

(d) A person holding a permit issued by the Railroad Commission of Texas under Chapter 134 of the Texas Natural Resource Code that authorizes the drilling of a water well shall report monthly to the District the total amount of water withdrawn from the well, the quantity of water necessary for mining purposes, and the quantity of water withdrawn for other purposes.

(e) All wells qualifying as exempt wells pursuant to Subsection (a) of this Section, shall be registered with the District in accordance with these rules.

(f) All exempt wells shall be equipped and maintained so as to conform to the District rules requiring installation of casing, pipe, and fittings to prevent the escape of groundwater from a groundwater reservoir to any reservoir not containing groundwater and to prevent the pollution or harmful alteration of the character of the water in any groundwater

reservoir.

(g) All exempt wells shall comply with the spacing requirements set forth in these rules, except for wells exempt under Subsection (a)(4).

(h) The driller of an exempt well shall file the drilling log, and if available, a geophysical log, for the well with the District within 60 days of completion of the exempt well.

(i) An exemption under this section does not affect the District's authority to impose fees under Texas Water Code, Section 36.122 or Texas Water Code, Chapter 36, Subchapter G. Groundwater withdrawn from an exempt well and subsequently transported outside the boundaries of the District shall be subject to any applicable production and exportation fees.

(j) An exempt well will lose its exempt status if the well is subsequently altered, equipped, or used for a purpose or in a manner that is not exempt.

(k) The owner and/or operator of an exempt well must ensure that the well site is accessible to District representatives for inspection, and must cooperate fully in any reasonable inspection of the well and well site by District representatives.

§ 5.503 Loss of Exemption; Notice of Changed Circumstances

The owner and/or operator of a well that is exempt under this subchapter loses the exemption if the nature of the well changes such that the well no longer qualifies for the exemption. Within 30 days of the occurrence of any facts that may cause a well to lose its exemption, the owner and/or operator of the well shall give written notice to the District of the changed circumstances. If the board determines that the changed circumstances have caused the well to lose its exemption, then the board will issue an order declaring the loss of exemption and advising the well owner and/or operator that the well is subject to District regulation, including the duty to obtain a permit, or other regulation, as may be applicable.

§ 5.505 Well Conversions

(a) If the owner and/or operator of a well for which a groundwater withdrawal permit has been issued desires to convert the well to one exempt from the duty to obtain a groundwater withdrawal permit, the owner and/or operator must claim the exemption by abandoning the groundwater withdrawal permit and registering the well as provided for in Section 5.601.

(b) If the owner and/or operator of a well exempt from the duty to obtain a groundwater withdrawal permit desires to convert the well to one for which a groundwater withdrawal permit is required, then the owner and/or operator must apply for and obtain a groundwater withdrawal permit.

Subchapter F. Registration of Wells

§ 5.601 Registration of Exempt Wells

(a) No person may drill or operate an exempt well within the boundaries of the District without first registering the well with the District using a registration form approved by the District, and obtaining written District approval of the registration and agreement that the well qualifies as exempt. All registrations for existing exempt wells shall be filed with the District on or before January 1, 2009.

(b) In addition to the information specified in Section 9.107 of these rules (Contents of and Requirements for All Applications; Registrations and Notices of Transfer of Ownership), a well registration shall contain the following, as applicable:

(1) the name, address and phone number of the registrant and the owner of the land on which the well is or will be located;

(2) if the registrant is other than the owner of the property, documentation establishing the applicable authority to construct and operate a well for the proposed use;

(3) a statement of the nature and purpose of the existing or proposed use and the annual amount of water used or to be used for each purpose;

(4) the location of the well;

(5) the physical address of the property upon which the well is located;

(6) the location where the water from the well will be used;

(7) information relating to the size, source of power, and estimated production rate (in gallons per minute, "gpm") of the pump used or to be used in the well;

(8) the depth or proposed depth of the well and the depth of the casing;

(9) the internal diameter of the well casing.

(10) the approximate date that the well was or will be constructed;

(11) the name, address, and telephone number of the well driller who constructed or will construct the well, and related information;

(12) a copy of any well drilling and completion report, driller's logs, geophysical logs, or well equipping report which pertain to the well;

(13) the size of the tract of land on which the well site is located, including the total number of acres owned by the registrant upon which the well is or will be located;

(14) a legal description of the location of the well, including: the county, section, block and survey, and the number of feet to the two nearest public streets or highways;

or other adequate legal description approved by the District;

(15) if requested by the District:

(A) a city or county map with the location of the property on which the well is located highlighted and the location of the well pinpointed; and

(B) a map or plat of the property on which the well is located, drawn to scale, not greater than 1000 feet to an inch (1" = 1000') that shows the pinpoint location of the well;

(16) the maximum amount of groundwater that the well is or will be capable of withdrawing per day stated in gallons;

(17) where applicable, a copy of any permit issued by the Railroad Commission of Texas relevant to the well; and

(18) any other information deemed necessary by the board in order to determine whether the well qualifies for exempt well status.

(c) The general manager may approve a well registration if the general manager finds that:

(1) the well is eligible to be registered;

(2) the registration is complete;

(3) the registration complies with the rules of the District;

(4) all applicable fees have been paid;

(5) the registration identifies a proposed or an existing well;

(6) the wellhead is or will be physically located within the boundaries of the District;

(7) the production from the well is proposed to be placed to a beneficial use;

(8) the registrant has a legal right to make withdrawals from the well;

(9) for new wells that are not dewatering or monitoring wells, the proposed well location complies with the spacing rules;

(10) the registrant is in compliance with any permits the registrant holds from the District and with District rules;

(11) the well will be installed, equipped, operated, maintained, or closed, as appropriate, to preserve, protect, prevent the pollution, degradation, or harmful alteration of, control and prevent the waste of, prevent the escape of, and achieve the conservation of

groundwater in the aquifer;

(12) the registrant intends to install, equip, operate, maintain, and close the well, as appropriate, in accordance with the manufacturer's standards, instructions, or recommendations, as may be applicable, and the District rules; and

(13) the well meets the criteria for exempt well status pursuant to Section 5.501 of these Rules.

(d) If the general manager makes a preliminary determination that the well is ineligible to be registered, then the matter shall be referred to the board for its consideration. If the board determines that the well is ineligible to be registered, then the owner and/or operator of the well shall file an application for, as applicable, a groundwater withdrawal permit, and/or a well drilling permit, under these rules.

CHAPTER 6. WELL MANAGEMENT

Subchapter A. General Provisions

§ 6.1 Responsibility for Well Management

Well owners and/or operators shall be responsible for the installation, equipping, operation, maintenance, and closure of their wells, and all costs associated therewith.

§ 6.3 Well Construction and Pump Installation Standards

(a) All new wells located within the District's boundaries shall be installed, equipped, operated, maintained, and closed in accordance with Chapters 1901 and 1902, Texas Occupations Code, and Chapter 76, 16 Texas Administrative Code, as may be amended, the Texas Department of Licensing and Regulation's rules on water well drillers and water well pump installers, irrespective of whether the well is required to obtain a drilling permit from the District. In addition, all new wells located within the District's boundaries that are completed so as to be capable of producing groundwater from the Trinity Aquifer shall be located, drilled, equipped, and operated in accordance with 30 Texas Administrative Code § 290.41(c)(1)(A)-(D), (c)(2), (c)(3)(B) – (F)(i), (c)(3)(H) – (Q). To the extent that any of the applicable requirements cited in this section conflict, the well owner and/or operator, driller and/or pump installer shall comply with the requirement that is more protective of groundwater and the environment.

(b) Any existing well or pump that is altered, reworked, redrilled, reequipped or replaced must be done in accordance with the standards in Subsection (a), irrespective of whether the well owner and/or operator is required to obtain a drilling permit from the District.

§ 6.7 Re-completions

(a) The landowner, well owner and/or operator shall have the continuing responsibility of insuring that a well does not allow commingling of undesirable water and fresh water or the loss of water through the wellbore to other porous strata.

(b) If a well is allowing the commingling of undesirable water and fresh water or the loss of water, and the casing in the well cannot be removed and the well re-completed within the applicable rules, the casing in the well shall be perforated and cemented in a manner that will prevent the commingling or loss of water. If such a well has no casing, then the well shall be cased and cemented, or plugged in a manner that will prevent such commingling or loss of water.

(c) The board may direct the landowner, well owner and/or operator to take steps to prevent the commingling of undesirable water and fresh water, or the loss of water.

Subchapter B. Well Spacing and Location Requirements

§ 6.101 Location of Wells

(a) All new wells, except for dewatering and monitoring wells, must comply with the location requirements set forth in the Texas Department of Licensing and Regulation's rules in Chapter 76, 16 Texas Administrative Code, as may be amended.

(b) All new wells must be located a minimum horizontal distance of 50 feet from any property line.

(c) No new well may be located within five hundred (500) feet of a sewage treatment plant, solid waste disposal site, or land irrigated by sewage plant effluent, or within three hundred (300) feet of a sewage wet well, sewage pumping station, or a drainage ditch that contains industrial waste discharges or wastes from sewage treatment systems.

§ 6.103 Required Well Spacing

(a) All new wells drilled into the Hensel Formation or the Hosston Formation of the Trinity Aquifer with a maximum production capacity of 50 gallons per minute or less shall be located a minimum distance of one thousand (1,000) feet from any other well, other than an abandoned well, completed in the same management zone of the Trinity Aquifer.

(b) All new wells drilled into the Hensel Formation or the Hosston Formation of the Trinity Aquifer with a maximum production capacity of more than 50 gallons per minute shall be located a minimum distance of one thousand (1,000) feet plus 20 additional feet for each additional gallon per minute of capacity over 50 gallons per minute from any other well completed in the same management zone of the Trinity Aquifer.

(c) The spacing requirements set forth in Subsections (a) and (b) of this section are not applicable to a replacement well, a dewatering well or a monitoring well, or any well that was completed on or before February 28, 2008. However, any well exempt from the spacing requirements because it was completed on or before February 28, 2008 will lose its exemption and become subject to the spacing requirements if, after February 28, 2008, the well is modified in a manner that substantially increases the capacity of the well.

§ 6.105 Applications for Variance from Well Spacing Limitations

In addition to the information specified in Section 9.107 (Contents of and Requirements for All Applications and Registrations), an application for variance from well spacing limitations shall contain the following:

(a) Name and Address of Owner. The full name, address, telephone number, and electronic mail address of the owner of the proposed well.

(b) Name and Address of Operator. The full name, address, telephone number, and electronic mail address of the operator of the proposed well if not operated by the well owner.

(c) Drilling Application Number. The drilling permit application number for the proposed well.

(d) The names and addresses of owners of wells located within the applicable minimum well spacing distance mandated in § 6.103 from the proposed well.

(e) Information about why the applicable well spacing requirements mandated in § 6.103 cannot be complied with, if applicable.

(f) Information demonstrating that the operation of the proposed well will not substantially interfere with the use and enjoyment of wells located within the minimum well spacing distance mandated in § 6.103, if applicable.

(g) Signed waivers from all owners of wells located within the applicable minimum well spacing distance mandated in § 6.103 from the proposed well stating that they have no objection to the District granting the requested variance, if applicable.

(h) Any other information as may be required by the District.

§ 6.107 Variances from Well Spacing Limitations; Protesting Variance Applications

(a) The board may grant a variance from the well spacing limitations set forth in § 6.103 if the board finds that:

(1) an administratively complete application for variance from well spacing limitations has been filed;

(2) the application complies with the rules of the District;

(3) all applicable fees have been paid;

(4) the applicant has shown good cause why the applicable well spacing limitations mandated in § 6.103 cannot be complied with; and

(5) the applicant has demonstrated that the operation of the proposed well will not substantially interfere with the use and enjoyment of wells located within the minimum well spacing distance mandated in § 6.103.

(b) The board may also grant a variance from the well spacing limitations set forth in § 6.103 if the board finds that:

(1) an administratively complete application for a variance from the well spacing limitations has been filed;

(2) the application complies with the rules of the District;

(3) all applicable fees have been paid; and

(4) the applicant presents signed waivers from all owners of wells located

within the applicable minimum well spacing distance mandated in § 6.103 from the proposed well stating that they have no objection to the District granting the requested variance.

(c) A well owner with a well located within the applicable minimum well spacing distance mandated in § 6.103 from the proposed well may protest the application for variance from spacing limitations pursuant to the procedures set forth in Subchapter D of Chapter 9. If timely protested, the issue of spacing limitations will be decided utilizing the contested case process set out in Subchapter D of Chapter 9. If the board chooses to grant a variance to drill a well that does not meet the spacing limitations mandated in § 6.103, the board may limit the production of the well to ensure that the well will not substantially interfere with the use and enjoyment of wells located within the minimum well spacing distance mandated in § 6.103.

(d) The board, on its own motion, may enter special orders or add special permit conditions increasing or decreasing spacing requirements if site-specific conditions warrant.

Subchapter C. Well Drilling Permits

§ 6.201 Well Drilling Permits Required; Applications; Exception for Exempt Wells

(a) Drilling, equipping or completing any non-exempt well or increasing the size or capacity of a non-exempt well or well pump without a well drilling permit required by this subchapter is illegal, waste, and a nuisance per se.

(b) The owner and/or operator of a well or proposed well must apply for and obtain from the District a well drilling permit before drilling, equipping or completing any non-exempt well, including performing any physical alteration of a well to convert it from an exempt well to a non-exempt well, or a well exempt from permitting under § 5.501(b), or increasing the size or capacity of a well or well pump.

(c) Any person seeking to perform any of the activities identified in Subsection (b) must file with the District an application for a well drilling permit on a form prescribed by the District.

(d) A drilling permit is not required for well maintenance or repair that does not increase the production capabilities of the well to more than its authorized production rate except for a well that is being converted from an exempt well to a non-exempt well.

§ 6.203 Applications for Well Drilling Permits

In addition to the information specified in Section 9.107 (Contents of and Requirements for All Applications and Registrations), an application for a well drilling permit shall contain the following:

(a) Name and Address of Owner. The full name, address, telephone number, and electronic mail address of the owner of the well or proposed well.

(b) Name and Address of Operator. The full name, address, telephone number, and electronic mail address of the operator of the well or proposed well if not operated by the well owner.

(c) Description of Proposed Activity. A description of the activity for which a well drilling permit is being sought (e.g., drilling a new well, altering an existing well, installing a larger pump).

(d) Well Address. The physical address of the property upon which the well or proposed well will or is to be located.

(e) Well Location. A description of the actual or proposed location of the well, including: the county; section, block and survey and the number of feet to the two nearest non-parallel property lines (legal survey lines), and the latitude and longitude for the well based on readings from a global positioning satellite (GPS) accurate to within 50 feet.

(f) Map. A city or county map with the location of the property on which the well is

or will be located highlighted and the location of the well pinpointed.

(g) Purpose of Use. The proposed purpose of use for the water stated in definite terms.

(h) Amount of Annual Withdrawal. The total amount of groundwater proposed to be withdrawn from the aquifer and beneficially used on an annual basis, stated in number of acre-feet or gallons.

(i) Rate of Withdrawal. The maximum rate of withdrawal that the well will be capable of, in gallons per minute.

(j) Depth. The proposed depth of the well and proposed depth of cement casing.

(k) Casing. The proposed depth of the cemented casing and cementing methodology.

(l) Depth of Strata. The predicted depth to the top of targeted water-bearing strata.

(m) Pump. The size of the proposed pump and pumping method.

(n) Proposed Construction Date. The approximate date that well construction operations are proposed to begin.

(o) Identity of Well Driller. The name, address, telephone number and driller's license number of the well driller.

(p) Water source. The applicant shall identify the intended source or sources of water for the well.

(q) Legal Basis of Right to Withdraw Groundwater. The applicant shall identify the legal basis under which groundwater will be withdrawn from the well (groundwater withdrawal permit or interim production status) and which the applicant either owns or is seeking to obtain.

(r) Any other information as may be required by the District.

§ 6.205 Basis for Action on Well Drilling Permit Applications

The board shall grant an application for a well drilling permit if the board finds that:

(a) the application is complete;

(b) the application complies with the rules of the District;

(c) all applicable fees have been paid;

(d) the applicant owns the well;

(e) the application identifies a proposed or an existing well;

(f) the wellhead is or will be physically located within the boundaries of the District;

(g) the well is designed to produce groundwater from a groundwater source within the District;

(h) the withdrawals are proposed to be placed to a beneficial use;

(i) the applicant has a legal right to make withdrawals from the well;

(j) the well location complies with the spacing rules;

(k) the applicant is in compliance with any permits the applicant holds from the District and with District rules;

(l) the well will be installed, equipped, operated, maintained, or closed, as appropriate, to preserve, protect, prevent the pollution, degradation, or harmful alteration of, control and prevent the waste of, prevent the escape of, and achieve the conservation of groundwater;

(m) the applicant intends to install, equip, operate, maintain, and close the well, as appropriate, in accordance with the manufacturer's standards, instructions, or recommendations, as may be applicable; and

(n) the well will be installed, equipped, operated, maintained, or closed, as appropriate, consistent with applicable local, state, and federal law.

§ 6.207 Well Drilling Permit Does Not Authorize Withdrawals

No water may be withdrawn or produced from a well for which the District has solely issued a well drilling permit, except for the purposes of drilling or testing the well during the time the well drilling permit is valid, and the well shall not be placed into operation without the owner or operator of such well first obtaining a groundwater withdrawal permit.

§ 6.209 Well Drilling Permit Terms; Extensions; Applications

A well drilling permit shall expire and be void and of no force or effect 120 days from the date of issuance of the permit, or upon the expiration of any permit extension. The board, for good cause, may extend the term of a drilling permit for up to two additional 120-day periods. In order to extend the period, the permittee must file with the District an application to extend the term. The application must be filed with the District during the original 120-day term, or the first extension period, as appropriate.

§ 6.211 Multiple Test Wells Authorized

A well drilling permit authorizes the completion of a single well. However, a holder of a well drilling permit may, within a radius of 200 yards from the authorized well location specified in a well drilling permit, drill multiple test wells in order to identify the best location for the completed well. The coordinates of the location ultimately chosen must be provided to the

District and the well drilling permit will be modified as necessary to reflect the chosen location. The chosen location must comply with all applicable spacing and location requirements. All test wells must, within 60 days, be completely plugged in compliance with applicable well plugging standards.

§ 6.213 Basis for Action on Applications to Extend Well Drilling Permit Term

The board shall grant an application to extend a drilling permit term if the board finds that:

(a) the application is complete;

(b) the application complies with the rules of the District;

(c) all applicable fees have been paid;

(d) the applicant filed the original drilling permit application;

(e) the applicant is in compliance with any permits the applicant holds from the District and with District rules; and

(f) a reasonable basis for the need for the extension is established and demonstrates that the failure to complete the well is not due to the permittee's own lack of due diligence.

§ 6.215 Contents of Well Drilling Permits

Well drilling permits shall contain the following:

(a) name, address and telephone number of the permittee;

(b) name, address and telephone number of an authorized representative, if any, of the permittee;

(c) permit term;

(d) purpose of use of the well;

(e) maximum rate of withdrawal in gallons per minute;

(f) legal description of the location of the well, including, county, section, block and survey, and the latitude and longitude for the well based on readings from a global positioning satellite (GPS) accurate to within 50 feet;

(g) identification of the legal authority to produce groundwater from the well (groundwater withdrawal permit) which the applicant either owns or is seeking to obtain;

(h) the groundwater source;

(i) size of the pump, pumping rate, and pumping method;

(j) meter specifications, if any;

(k) borehole diameter; external and internal diameter of casing; total depth of casing; depth of grout; total well depth; screen, perforation, and filter pack intervals; and other well installation specifications, as appropriate;

(l) any conservation-oriented methods of drilling prescribed by the District;

(m) all applicable reporting requirements;

(n) installation and completion schedule;

(o) a requirement that the permittee must file all applicable reports with the District prior to the production of water from the well, except for such production necessary to the drilling and testing of the well;

(p) a requirement that the permittee use reasonable diligence to protect groundwater quality and that all well plugging laws will be followed at the time of well closure;

(q) a copy of the approved water well closure plan, if any, or a requirement that the permittee will comply with well plugging law and report closure to the TDLR and the District; and

(r) any other appropriate conditions as determined by the board.

§ 6.217 Standard Permit Conditions

All well drilling permits shall be issued with and subject to the following conditions:

(a) the duty to properly close (cap or plug) all wells in accordance with applicable law, and comply with either the District's well closure plan, if any, as may be amended from time to time, or the permittee's plan approved by the District, as appropriate;

(b) the duty to file all applicable reports with the District, and other appropriate federal, state, or local governments;

(c) the duty to use diligence to protect the groundwater quality of the aquifer;

(d) the duty to comply with the District rules as may be amended;

(e) permit review, or extension conditions;

(f) the duty to locate all wells, and confirm the actual location with the proposed location in the application or as provided for in the permit, consistent with the District's well spacing rules, prior to the production from any wells identified in the permit or application;

(g) the continuing right of the District to supervise and manage groundwater production and the depletion of the aquifer;

(h) installation, equipping, operation, maintenance, and closure of all wells in accordance with the District rules, and other applicable federal, state, and local law;

(i) installation, equipping, operation, and maintenance of all meters in accordance with the District rules;

(j) the duty to pay and be current in the payment of all applicable fees;

(k) the duty to give notice to District of any changes in name, address, or telephone number of the permittee, or the authorized representative, the landowner, well owner, or well operator, as may be appropriate;

(l) the duty to comply with all of the terms and conditions of the permit;

(m) the duty to ensure that the well site is accessible to District representatives for inspection, and to cooperate fully in any reasonable inspection of the well and well site by District representatives;

(n) the right of the District to enter land under Section 36.123, Texas Water Code, as may be amended; and

(o) any other conditions as the board may deem appropriate.

§ 6.219 Notice of Condition Affecting Groundwater Quality; Corrective Action

If at any time a well owner or operator has reason to believe that a well condition may exist that may cause the pollution, degradation, or harmful alteration of the character of the groundwater in the aquifer, then the owner and/or operator shall, within forty-eight (48) hours of learning of the fact(s), notify the District in writing of the well condition. The District may conduct an investigation and, if facts warrant, direct the owner and/or operator of the well, at the owner's or operator cost, to evaluate and test the well conditions and take appropriate corrective action, including replacement, to bring the well into proper working condition in conformance with this chapter.

§ 6.221 Notice of Commencement of Well Construction Activities

No later than 3 days prior to commencement of the activities authorized in a well drilling permit, the permittee shall give notice to the District of the intent to commence, so that a representative of the District may attend and observe the activities, at the District's discretion.

§ 6.223 Replacement of Wells

(a) A well owner or operator may rework, re-equip, re-drill or replace an existing permitted or registered well by filing an application to amend such permit or registration, and applying for a well drilling permit, providing such information as may be required by the General Manager, under the following conditions:

(1) The replacement well must be drilled within 150 feet of the original

permitted location and shall not be drilled nearer to the property line than the original well;

(2) The replacement well shall not be located any closer to any other permitted well or authorized well site than the well being replaced, unless the new location complies with the minimum spacing requirements set out in Subchapter B of Chapter 6 of these rules;

(3) The replacement well or pump shall not be changed to a larger size or capacity so as to increase the rate of production authorized in such permit; and

(4) If a replacement well is drilled, the well owner or operator shall cease production from the existing permitted or registered well and ensure that the replaced well is, within 90 days:

(A) plugged;

(B) capped; or

(C) re-equipped to meet the eligibility requirements applicable to an exempt well and registered under Subchapters E and F of Chapter 5 of these rules or applicable to a monitoring well under these rules.

§ 6.225 Transfer of Well Drilling Permit Prohibited

No person may transfer the ownership of a well drilling permit issued by the District.

§ 6.227 Additional Logging Requirements for Trinity Wells

Within 60 days after drilling any well completed so as to be capable of producing water from the Trinity Aquifer, the well owner and/or operator shall have prepared and delivered to the District an electric or geophysical log showing for the well, at a minimum, electrical conductance, spontaneous potential, and natural gamma.

Subchapter D. Well Construction

§ 6.301 Unlicensed or Unregistered Well Drillers or Pump Installers Prohibited

(a) Except as otherwise provided in Subsection (b) of this section, within the District's boundaries no person may drill or construct a water well unless the person first holds a well driller's license issued by the TDLR under Chapter 1901, Texas Occupations Code; and Chapter 76, 16 Texas Administrative Code, as may be amended.

(b) The requirement to hold a well driller's license pursuant to Subsection (a) of this Section does not apply to any person who personally drills, constructs or alters a water well on his own property for his own use.

(c) Except as otherwise provided in Subsection (d) of this section, within the District's boundaries, no person may install or repair a water well pump unless the person first holds a pump installer's license issued by the TDLR under Chapter 1902, Texas Occupations Code; and Chapter 76, 16 Texas Administrative Code, as may be amended.

(d) The requirement to hold a pump installer's license issued by the TDLR pursuant to Subsection (c) of this Section does not apply to:

(1) any person who personally installs or repairs a water well pump on his own property, or on property that he has leased or rented, for his own use; or

(2) any person who is a ranch or farm employee whose general duties include personally installing or repairing a water well pump or equipment on his employer's property for his employer's use, but who is not employed or otherwise in the business of installation or repair of water pumps or equipment.

(e) Regardless of whether a license is required, all persons engaging in well drilling or pump installation or repair must comply with the applicable standards set forth in Chapter 76, 16 Texas Administrative Code, of the TDLR's Rules, as may be amended, and the District rules. In the event that a specific provision in the District rules conflicts with a specific provision in the TDLR's rules, the more stringent provision will govern.

§ 6.303 Notice of Commencement of Well Installation

Not less than 3 days prior to the commencement of the activities authorized in a well drilling permit, the well driller shall give notice to the District of the intent to commence, so that a representative of the District may attend and observe the activities, at the District's discretion.

§ 6.305 Confirmation and Posting of Drilling Permits and Registrations

Any well driller engaged to drill or otherwise construct a well within the District shall, before undertaking any drilling or construction operations, confirm with the District that any required well drilling permit or other permit or registration has been issued for the well and is in effect. In addition, at all times during well drilling or construction operations, the driller shall post a copy of any permit or registration for the well at a location at the well site that can be

easily seen by visitors to the well site.

§ 6.307 Well Records, Reports, and Logs

The driller of any well within the District, regardless of whether the well qualifies or does not qualify as an exempt well, shall keep and maintain for at least three years an accurate driller's log for each such well. The driller shall file a copy of each driller's log, a report detailing the drilling, equipping, and completing of the well and, if performed, any electric or geophysical log, pump test results, water quality sampling results, and well video surveys with the District within 60 days after the date the well is completed. The report shall include copies of all information about the well submitted to any agency of the State of Texas.

Subchapter E. Capping of Wells

§ 6.401 Capping Requirements

(a) Every owner or operator of any land within the District upon which is located any open or uncovered well shall be required to cap or close the well with a covering capable of preventing the entrance of surface pollutants into the well and of sustaining a weight of at least four-hundred (400) pounds, except when said well is in actual use by the owner or operator thereof.

(b) In addition, every owner or operator of any land within the District upon which is located a flowing artesian water well shall be required to cap or close the well with a covering capable of preventing any flow and therefore preventing waste, except when the well is in actual use by the owner or operator thereof.

(c) If the owner or operator fails or refuses to close or cap the well in compliance with this section, the District, or its employees or agents, may go on the land and close or cap the well safely and securely. Reasonable expenses incurred by the District in closing or capping a well constitute a lien on the land on which the well is located. The lien arises and attaches upon recordation of an affidavit in the deed records of the county where the well is located, executed by any person conversant with the facts, stating the following:

(1) the existence of the well;

(2) the legal description of the property on which the well is located;

(3) the approximate location of the well on the property;

(4) the failure or refusal of the owner or operator, after notification, to close the well within 10 days after the notification;

(5) the closing of the well by the District, or by an authorized agent, representative, or employee of the District; and

(6) the expense incurred by the District in closing the well.

Subchapter F. Plugging of Abandoned or Deteriorated Wells

§ 6.501 Responsibility

It is the responsibility of the well owner and/or operator to plug or have plugged any well that is deteriorated or abandoned, in accordance with Chapter 1901, Texas Occupations Code and Title 16, Chapter 76, Texas Administrative Code, as may be amended.

§ 6.503 Report on Plugging of Wells

The person that plugs a well shall, within thirty (30) days after plugging is complete, submit a copy of the plugging report (on forms furnished by the Texas Department of Licensing and Regulation) to the District.

CHAPTER 7. FEES

§ 7.1 Registration Fees

(a) By resolution and order, the District shall adopt a well registration fee for exempt wells completed so as, in the opinion of the District, to be capable of producing water from the Trinity Aquiferor Brazos River Alluvium Aquifer, and for all other exempt wells. The registration fee shall be determined based on the District's estimated processing costs for such registrations.

(b) The applicable registration fee must accompany the registration form and be paid at the time of filing. If the registrant fails to pay the fee at the time of filing, the District may refuse to accept the registration for filing and/or commence any other action to enforce payment as authorized by law.

§ 7.3 Application Fees

(a) By resolution and order, the District shall adopt an application fee for the following applications:

(1) a new or amended groundwater withdrawal permit application, except as provided in Subsections (b) and (c);

(2) a new or amended groundwater exportation permit application; and

(3) a well drilling permit application.

(b) By resolution and order, the District shall adopt an application fee for the following applications:

(1) a new or amended groundwater withdrawal permit application relating to a well drilled at a depth of less than 100 feet;

(2) a well drilling permit application for a well drilled at a depth of less than 100 feet.

(c) By resolution and order, the District shall adopt an application fee for the following applications:

(1) an application to amend a groundwater withdrawal permit for a year or less;

(2) an application to amend a groundwater exportation permit for a year or less; and

(3) an application to amend a groundwater withdrawal permit based solely on installing a replacement well.

(d) All required fees must accompany the application form and be paid at the time of

filing. If the applicant fails to pay the fee at the time of filing, the District may refuse to accept the application for filing, or otherwise cease processing the application.

(e) The District shall adopt application fees for the purpose of compensating the District for the administrative functions associated with the applications. If an application fee is determined by the District to be insufficient to cover the anticipated costs of processing the application, the District shall require the applicant to post additional funds in an amount determined to be sufficient to cover anticipated costs. The costs for which the District may seek additional fees include, but are not limited to, the cost for public notices, legal fees, expert fees, hearing facility rental fees, and other expenses. If the applicant fails to pay the additional amounts, then the District may suspend processing the application, and may return the application. As application processing costs are incurred by the District, at the District's discretion, the District may incur costs itself and seek reimbursement from the additional deposited funds, or may expend deposited funds directly to pay for additional application processing costs. The applicant shall be provided periodic accountings of billings against the deposit. If the additional deposit is determined by the District to be insufficient to cover the application processing costs, then the applicant may be required to pay additional fee deposits. Any unexpended and unobligated fee deposits will be promptly returned to the applicant after the board issues a final order disposing of the application.

§ 7.4 Annual Well Fees

(a) By resolution and order, the District shall adopt a non-refundable well fee per well on all non-exempt wells in the District.

(b) The District shall adopt annual well fees for the purpose of compensating the District for the administrative functions associated with well inspections and monitoring.

(c) All Historic Use Production Permit and Non-Historic Use Production Permit owners are required to pay the annual well fee assessed under this section by February 15th for that calendar year.

§ 7.5 Groundwater Production Fees

(a) The District shall assess groundwater production fees as set forth in this chapter.

(b) Except for withdrawals of groundwater made from an exempt well as defined under Section 5.501, groundwater production fees shall be assessed by the District against all withdrawals of groundwater from within the boundaries of the District.

(c) Annually, the groundwater production fees for agricultural use and non-agricultural uses for the fiscal year shall be calculated and assessed by resolution and order based on the District's adoption of a budget reflecting annual operating revenue requirements for the fiscal year. The groundwater production fee for agricultural use shall not exceed 20% of the fee for non-agricultural uses nor $1 per acre-foot annually. The District shall calculate the groundwater production fee for non-agricultural uses on a per acre-foot basis as follows: the District's estimated net annual operating revenue requirements minus an estimate of the amount of other fees to be collected divided by the amount of groundwater estimated to be withdrawn in

acre-feet by non-agricultural users. The groundwater production fee shall be assessed against the amount of groundwater actually produced.

(d) All persons making withdrawals of groundwater from a non-exempt well within the boundaries of the District are required to pay to the District the groundwater production fee as assessed pursuant to this section. Each non-exempt well owner and/or operator shall complete a groundwater use report as required by Section 8.7, and return the completed report, along with payment of the applicable groundwater production fees, to the District by no later than the 15th day of the month. The amount due becomes delinquent if payment in full is not received by the District by the 30th day of the month following the month for which the fees were assessed.

(e) For any groundwater production fee that is delinquent, the District may assess, for every month thereafter that the invoice remains delinquent, a penalty equivalent to the maximum amount allowed by law.

§ 7.7 Limitation on Amount of Assessments

The District may not assess a total amount of groundwater production fees that is more than is reasonably necessary for the annual operating revenue requirements for the administration of the District as reflected in its adopted annual fiscal year budget.

§ 7.9 Enforcement for Nonpayment

If the District determines that a fee is delinquent, enforcement for nonpayment may be as follows:

(1) by suspending the processing of any application that the person owing the fee, or his successor in interest, may have pending before the District; or

(2) by commencing any action to enforce payment and collection of the delinquent fee as may be authorized by law.

§ 7.11 Prohibitions

No person may withdraw groundwater from within the boundaries of the District if the person, or his predecessor in interest, is delinquent in the payment of a groundwater production fee or annual well fee that is due and payable to the District.

§ 7.13 Unauthorized Withdrawals

(a) Any person who withdraws groundwater from within the boundaries of the District without legal authority shall pay to the District the groundwater production fees and annual well fees in force and effect for the period of time during which the unauthorized withdrawals were made. The District shall assess groundwater production fees based on the amount of groundwater the District reasonably estimates was actually withdrawn.

(b) If a person makes withdrawals of groundwater that are not being metered and reported in accordance with Chapter 8 of these rules, the board may assess groundwater

production fees based on the amount of water the permittee is authorized to withdraw under a groundwater withdrawal permit or based on the amount of groundwater the District reasonably estimates was actually withdrawn.

§ 7.15 Groundwater Export Fees

(a) The District shall assess, and all persons exporting groundwater produced from a well within the District's boundaries to a place of use outside of the District's boundaries shall pay, a groundwater export fee on the metered volume of groundwater produced for export. The groundwater export fee will be in addition to any production fees assessed by the District. The groundwater export fee applies to and will be assessed on all groundwater produced as follows:

(1) water actually exported from the District's boundaries to a place of use outside the District's boundaries;

(2) operational water that is lost in the operation and maintenance of the export project and not actually exported from the District's boundaries; and

(3) reject water processed in order to produce water of a suitable quality for export and not actually exported from the District's boundaries.

(b) The groundwater export fee shall be calculated and assessed as follows: 50% of the groundwater production fee assessed under Section 7.5 for that use

(c) The District will bill and collect the groundwater export fee. The monthly groundwater exportation report shall constitute the groundwater export fee invoice. At the end of each month, the holder of a groundwater export permit shall complete a groundwater exportation report, using the District's form, reporting the total amount of groundwater exported during the immediately preceding month, and return the completed form, along with payment of the applicable groundwater export fees, to the District by no later than the 15th day after the end of the month for which the fees are assessed. The amount due becomes delinquent if payment in full is not received by the District by the 30th day after the end of the month for which the fees were assessed.

(d) For any export fee that is delinquent, if payment in full is not received on or before 10 days after the date the amount becomes delinquent, then the District shall assess, for every month thereafter that the invoice remains delinquent, an administrative penalty of 10%. Additionally, each day that an export fee is delinquent constitutes a separate violation of the District rules.

(e) No person may export groundwater outside the District's boundaries if the owner and/or operator of the well from which the exported groundwater is produced is delinquent in the payment of any fee that is due and payable to the District.

(f) Any person who, without any legal authority, exports groundwater outside the District's boundaries shall pay to the District the export fee then in force and effect for the period of time during which the unauthorized exports were made.

(g) Any person who exports groundwater outside the District's boundaries without metering in accordance with Chapter 8 of these rules, shall pay to the District the export fee then in force and effect based on the maximum amount of water the person is authorized to export under a groundwater exportation permit.

(h) A groundwater export fee shall not be assessed against:

(1) groundwater produced from within the District that is incorporated into a finished, manufactured product within the District and then exported for sale outside of the District;

(2) groundwater produced from within the District, where the well is situated on a contiguous tract of land that straddles the District boundary and the groundwater is placed to use solely on that tract, but including portions outside the District's boundaries; and

(3) groundwater produced from within the District and supplied by a public water system to customers within the public water system's retail service area where that retail service area straddles the District boundaries. This exception does not apply to any water produced within the District's boundaries by a public water system that is conveyed outside the District's boundaries for any use other than retail service to the public water system's own customers.

§ 7.17 Inspection and Plan Review Fees

The board may, by rule, establish fees for the inspection of wells, meters, or other inspection activities; plan reviews; special inspection services requested by other entities; or other similar services that require involvement of District personnel or its agents. Fees may be based on the amount of the District's time and involvement, out-of-pocket costs, number of wells, well production, well bore, casing size, size of transporting facilities, or amounts of water transported.

CHAPTER 8. METERS AND REPORTING

§ 8.1 Meters Required

(a) Duty to Install: The owner and/or operator of a non-exempt well located within the District shall equip the well with a meter meeting the specifications of these Rules and shall operate and maintain the meter to measure the instantaneous flow rate and cumulative amount of groundwater withdrawn from the well. For an existing, non-exempt well, a meter shall be installed by the owner and/or operator no later than February 1, 2008. For a new, non-exempt well, a meter shall be installed before any groundwater is withdrawn from the well.

(b) Approved Meters: Meters must be mechanically driven, digital, totalizing water meters. The digital totalizer must not be resettable by the permittee and must be capable of a maximum reading greater than the maximum expected pumpage during a permit term. Battery operated registers must have a minimum five-year life expectancy and must be permanently hermetically sealed. Battery operated registers must visibly display the expiration date of the battery. All meters must meet the requirements for registration accuracy set forth in the American Water Works Association standards for cold-water meters.

(c) Installation and maintenance: Meters must be installed, operated, maintained, and repaired according to the manufacturer's published specifications, and shall ensure an accuracy of not greater than plus or minus five percent. If no specifications are published, there must be a minimum length of five pipe diameters of straight pipe upstream of the meter and one pipe diameter of straight pipe downstream of the meter. These lengths of straight pipe must contain no check valves, tees, gate valves, back-flow preventers, blow-off valves, or any other fixture other than those flanges or welds necessary to connect straight pipe to the meter. The pipe must be completely full of water throughout the area of the meter. All installed meters must measure only groundwater.

(d) Bypasses: All bypasses must be metered. A bypass is any pipe of any size connected to the discharge pipe between the well and the meter.

(e) Meter accuracy to be tested: The District may require the permittee, at the permittee's expense, to test the accuracy of the meter and submit a certificate of the test results. The certificate must be on a form provided by the District. The District may further require that the test be performed by a third party qualified to perform meter tests. Certification tests will be required no more than once every three years for the same meter and installation. If the test results indicate an accuracy outside the 95% - 105% of the actual flow, then appropriate steps must be undertaken by the permittee to repair or replace the meter within 90 calendar days from the date of the test. The District, at its own expense, may undertake further random tests and other investigations for the purpose of verifying meter readings. If the District's tests or investigations reveal that a meter is not registering within an accuracy of 95% - 105% of actual flow, or is not properly recording the total flow of groundwater withdrawn from the well, or well system, the permittee must reimburse the District for the costs of those tests and investigations, and the permittee must take appropriate steps to remedy the problem within 90 calendar days from the date of the tests or investigations. If a water meter or related piping or equipment is tampered with or damaged so that the measurement accuracy is impaired, the District may

require the permittee, at the permittee's expense, to take appropriate steps to remedy any problem, and to retest the meter within 90 calendar days from the date the problem is discovered and reported to the permittee.

§ 8.3 Pre-existing Meters and Alternative Measuring Methods

(a) By no later than February 1, 2008, the owner and/or operator of an existing, non-exempt well shall register with the District any meter or alternative measurement(s) method installed and in use on the well as of the effective date of these rules.

(b) All meters existing on the effective date of these Rules and registered in accordance with Subsection (a) of this section shall be inspected by the District for compliance with the meter specifications set forth in these Rules. If the meter complies with these specifications, the District shall approve the meter in writing and advise the owner or operator of the approval. If the meter does not comply with these specifications, the District will issue a notice of deficiency and direct the owner and/or operator of the meter to install a new meter or modify the existing meter in compliance with these Rules within 45 days.

(c) If at any time the well owner or operator has reason to believe that a condition, of any kind whatsoever, may exist that affects the accuracy of a meter, then the well owner and/or operator shall, within seven days of learning of the fact(s), notify the District that the accuracy of the meter may be in question. Such notification shall be in writing.

(d) The District may conduct an investigation and, if facts warrant, direct the well owner and/or operator, at the well owner and/or operator's cost, to evaluate and test the accuracy of the meter and take appropriate corrective action, including replacement, to restore the accuracy and proper working condition of the meter in conformance with the requirements of these Rules.

§ 8.5 Removal and Disabling of Meters

(a) A meter may not be removed or otherwise disabled, including for routine maintenance, unless the well owner or operator gives the District prior notice, in writing, of the intent to remove or disable the meter. Except in cases of routine maintenance, such notice must be approved in writing by the District before the meter is removed or disabled.

(b) A meter may be removed or otherwise disabled, only by the well owner or operator or his or her authorized representative.

(c) During a period that a meter is removed or otherwise disabled, groundwater may not be withdrawn from the well, unless the District has approved an alternative measuring method.

§ 8.7 Meter Reading and Groundwater Use Reporting

The well owner and/or operator must read the meter associated with the well and record the meter readings and the actual amount of withdrawals on a form provided by the District by no later than the 15th of each month for the prior month's withdrawals. The District shall send to

each permittee an annual groundwater use report reflecting reported withdrawals for the previous calendar year. By not later than March 31st of each year, each non-exempt well owner and/or operator must return to the District the annual groundwater use report with any changes. Groundwater withdrawal reports shall provide the following: (1) name of the well owner and/or operator; (2) the well number; (3) the total amount of groundwater produced during the immediately preceding period, either month or calendar year (January 1 through December 31), including the total amount of groundwater produced during each separate month of the immediately preceding calendar year, by management zone, if appropriate; (4) the purpose for which the groundwater was used; and (5) any other information requested by the District as indicated on the report form.

CHAPTER 9. PROCEDURES BEFORE THE DISTRICT

Subchapter A. General

§ 9.1 Purpose

The purpose of this chapter is to provide for the procedures to be followed in the processing of applications and registrations, and other types of approvals or actions that may be taken by the District. These rules should be interpreted to simplify procedure, avoid delay, save expense, and facilitate the administration and enforcement of the District rules, policies, and objectives.

§ 9.3 Applicability

This chapter applies to the processing of all applications or registrations filed with the District, and to the adoption of rules and management plans by the District.

§ 9.5 Service of Documents

(a) Except as otherwise provided in these rules, all documents filed, served, or delivered under this chapter or these rules, must be served as follows:

(1) by delivering a copy to the person to be served, or the person's duly authorized agent or attorney of record, either in person or by agent or by carrier-receipted delivery or by United States mail, to the person's last known address;

(2) by facsimile to the recipient's current facsimile number; or

(3) by electronic mail to the recipient's electronic mail address.

(b) Service by mail shall be complete upon deposit of the document, enclosed in a postage-paid, properly addressed wrapper, in a post office or official depository under the care and custody of the United States Postal Service. Service by facsimile or electronic mail is complete upon transfer and shall be accomplished by 5:00 p.m. (as shown by the clock of the local time of the recipient) of the date on which it is due. Any transfer after 5:00 p.m. shall be deemed served on the following day. Service by facsimile or electronic mail must be followed by serving the original document in person, by mail or by carrier-receipted delivery within three days. Where service by the methods listed in Subsection (a) has proved unsuccessful, the service shall be complete upon publication of notice in a newspaper.

(c) Whenever a person has the right or is required to do some act within a prescribed period after the service of a document upon the person, and the document is served by mail or by facsimile, three days shall be added to the prescribed period. This subsection does not apply when documents are filed for consideration at a board meeting.

(d) A document served under this rule must contain a certificate of service indicating the date and manner of service and the name and address of each person served. The person or the person's attorney of record shall certify compliance with this rule in writing by signature on

the filed document. A certificate by a person or the person's attorney of record, or the return of an officer, or the affidavit of any person showing service of a document, shall be prima facie evidence of service.

(e) Nothing herein shall preclude any person from offering proof that the notice or instrument was not received or, if service was by mail, that it was not received within three days from the date of deposit in a post office or official depository under the care and custody of the United States Postal Service, and upon so finding, the District may extend the time for taking the action required of such party or grant such other relief as it deems just. The provisions herein relating to the method of service of notice are in addition to all other methods of service prescribed by these rules.

(f) In contested case hearings, copies of all documents filed with the presiding officer shall be served on all parties, including the District, no later than the day of filing.

Subchapter B. Requirements for Applications and Registrations

§ 9.101 Purpose

The purpose of this subchapter is to provide for the procedures to be followed for applications and registrations that may be filed with the District.

§ 9.103 Applicability

This subchapter applies to any application or registration filed with the District.

§ 9.105 Proper Applicant or Registrant

If a well or a proposed well has one owner or operator, that owner or operator shall file the application or registration required to be filed by the District. If there is more than one owner or operator, a joint application or registration shall be filed by those owners or operators. In such an instance, the owners or operators shall select one among them to act for and represent the others in filing the application or registration. Written documentation of such a selection satisfactory to the District shall be filed with the application or registration.

§ 9.107 Contents of and Requirements for All Applications and Registrations

All applications and registrations filed with the District shall be typewritten or printed legibly in ink and shall include:

(a) The full name, physical and mailing addresses, telephone number, and electronic mail address of the applicant or registrant. If the applicant or registrant is a partnership, the name of the partnership shall be followed by the words "a partnership." If the applicant or registrant is acting as trustee for another, the trustee's name shall be followed by the word "trustee." If one other than the named applicant or registrant executes the application or registration, the person executing the application or registration shall provide their name, position, physical address, mailing address, electronic mail address and telephone number.

(b) Signature of Applicant or Registrant. The application or registration shall be signed as follows:

(1) If the applicant or registrant is an individual, the application or registration shall be signed by the applicant, registrant or a duly appointed agent. An agent shall provide written evidence of his or her authority to represent the applicant or registrant. If the applicant or registrant is an individual doing business under an assumed name, the applicant or registrant shall attach to the application or registration an assumed name certificate filed with the county clerk of the county in which the principal place of business is located or the Secretary of State.

(2) Joint applications and registrations. A joint application or registration shall be signed by each applicant or registrant or each applicant's or registrant's duly authorized agent with written evidence of such agency submitted with the application or registration. If a well or proposed well is owned by both husband and wife, each person shall sign the application or registration. Joint applicants or registrants shall select one among them to act for and represent

the others in pursuing the application or registration with the District with written evidence of such representation to be submitted with the application or registration.

(3) If the application or registration is by a partnership, the application or registration shall be signed by one of the general partners. If the applicant or registrant is a partnership doing business under an assumed name, the applicant or registrant shall attach to the application or registration an assumed name certificate filed with the county clerk of the county in which the principal place of business is located or with the Secretary of State.

(4) If the applicant or registrant is an estate or guardianship, the application or registration shall be signed by the duly appointed guardian or representative of the estate and a current copy of the letters testamentary issued or order appointing guardian by the court shall be attached to the application or registration.

(5) If the applicant or registrant is a corporation, public district, county, municipality or other corporate entity, the application or registration shall be signed by a duly authorized official. Written evidence specifying the authority of the official to take such action shall be submitted along with the application or registration, including in the form of bylaws, charters, or resolutions. A corporation may file a corporate affidavit as evidence of the official's authority to sign.

(6) If the applicant or registrant is acting as trustee for another, the applicant or registrant shall sign as trustee and in the application or registration shall disclose the nature of the trust agreement and give the name and current address of each trust beneficiary.

(c) Attestation. Each applicant or registrant shall subscribe and swear or affirm under oath that the facts set out in the application or registration are accurate before any person entitled to administer oaths who shall also sign his or her name and affix his or her seal of office to the application, registration or notice.

Subchapter C. Application and Registration Processing by the District

§ 9.201 Purpose

The purpose of this subchapter is to provide the procedures to be followed in the processing of applications and registrations filed with the District.

§ 9.203 Applicability

This subchapter applies to the processing of all applications or registrations filed with the District.

§ 9.205 Initial Action on Applications and Registrations

All applications and registrations received by the District shall be stamped or marked "received" with the date of receipt clearly indicated.

§ 9.207 Review for Administrative Completeness

(a) The District will promptly conduct an initial review of each application or registration for administrative completeness.

(b) In reviewing an application or registration for administrative completeness, the District will assess whether the application or registration contains the necessary information in legible form to allow:

(1) the District staff to conduct a technical review, if appropriate; and

(2) the District to take or recommend action on the application or registration, as appropriate.

(c) Upon determining that an application or registration is administratively complete, the District will notify the applicant or registrant by mail.

§ 9.209 Return of Applications and Registrations Deemed Not Administratively Complete

(a) If the District determines that an application or registration is not administratively complete, the District will notify the applicant or registrant of any such deficiencies by mail or electronic mail. Illegible applications or registrations will be returned to the filer.

(b) The applicant or registrant may submit any additional necessary information in response to a letter sent by the District pursuant to Subsection (a) of this section, within 30 days of the date the letter noting the deficiencies was mailed or electronically mailed.

(c) If the additional necessary information is not forthcoming within 30 days of the date of receipt of the letter noting the deficiencies, the District will return the incomplete application or registration to the applicant or registrant.

§ 9.211 Technical Review

(a) After an application or registration is determined by the District to be administratively complete, District staff will commence a technical review of the application or registration as necessary and appropriate.

(b) The applicant or registrant shall be notified in writing of any additional material necessary for a complete technical review. If the applicant or registrant provides the information within 30 days of the date it is requested, District staff will complete the technical review of the application or registration. If the necessary additional information is not received by the District within 30 days of the date the information is requested and the information is considered essential by the District, the District may return the application to the applicant or registration to the registrant. Decisions to return an application to the applicant or registration to the registrant during the technical review will be made on a case-by-case basis.

(c) The general manager or his or her designee is entitled to enter public or private property at any reasonable time and upon reasonable notice for the purpose of inspecting, investigating or verifying conditions or information submitted in connection with an application or a registration.

(d) Following the readoption of the District's management plan in 2015, the District shall conduct a technical review of all Historic Use Production Permits and Non-Historic Use Production Permits authorizing withdrawals from the Trinity Aquifer to determine, to the extent reasonably possible, whether withdrawals are from the Hensell and/or the Hosston Management Zone and in what amount or amounts from each aquifer management zone withdrawals should be authorized to be made.

§ 9.213 General Manager's Proposed Action on Applications and Technical Summary

(a) Following completion of technical review, the general manager will determine whether to recommend granting or denying the application and will prepare a written statement summarizing the recommendation and the reasons for that recommendation. If the general manager recommends full or partial granting of a permit or permit amendment application, the general manager shall also prepare a draft permit. The general manager's recommendation and any draft permits are subject to change by the general manager or board during the course of the proceedings on the application. The statement and proposed permit or denial shall be available for public review and inspection.

(b) In conjunction with the proposed permit or denial, the general manager will prepare a technical summary that will include the following, as appropriate:

(1) the applicant or permittee's name and address;

(2) a summary of the application;

(3) the location of each point of withdrawal for an application;

(4) the reasons and technical basis for the recommended action;

(5) if applicable, a summary of the proposed permit;

(6) the proposed purpose(s) of use, if applicable;

(7) notice that the general manager may modify his or her recommendation, or seek additional information from the applicant or permittee, in the course of the District's proceeding on the application;

(8) as may be authorized by this chapter, a statement that the applicant, or other affected persons may file a request for a contested case hearing on the application on or before the deadline set forth in Section 9.307; and

(9) any other information that the general manager determines to be appropriate.

(c) The general manager will provide the applicant or permittee with a copy of the general manager's statement, any proposed permit or denial and the technical summary.

§ 9.215 Action by Board on Applications or Registrations Where There is No Right to a Contested Case Hearing

(a) Applicability. This section applies to all registrations and applications other than applications for groundwater withdrawal permits, groundwater exportation permits, and applications for a variance from well spacing limitations.

(b) Scheduling the Board Meeting. Following technical review and the referral of the proposed action to the board, the general manager will schedule the presentation of the application or registration and the proposed permit, approval, authorization or denial to the board. The board may reschedule the presentation of the application or registration and the proposed permit, approval, authorization or denial.

(c) Notice of Board Meeting. At least 10 days prior to the board meeting, the District will notify the applicant, registrant or permittee of the date of the board meeting referred to above. If rescheduled by the board, the District will send notice of the rescheduled meeting date to the applicant, registrant or permittee no later than ten days before the rescheduled meeting. In addition, the District will provide public notice that the application or registration and the permit, approval, authorization or denial will be considered by the board by including an item on the board's agenda pursuant to the Open Meetings Act. Except to the extent that such items contain information excepted from public disclosure under the Public Information Act, copies of the application or registration and the proposed permit, approval, authorization or denial will be made available to the public for inspection and copying at the offices of the District during regular business hours.

(d) Consolidation or Severance of Matters. Consistent with notices required by law, the board may consolidate related matters if the consolidation will not injure any party and may save time and expense or otherwise benefit the public interest and welfare. The board may sever

issues in a proceeding or hold special hearings on separate issues if doing so will not injure any party and may save time and expense or benefit the public interest and welfare.

(e) Oral Presentation Before the Board. The applicant, registrant or permittee and the general manager or his or her designee may make an oral presentation at the board meeting at which the application or registration and the proposed permit, approval, authorization or denial are presented to the board. Oral presentations before the board will be limited to 15 minutes each, excluding time for answering questions, unless the president establishes other limitations. Before the board meeting, the president may allot time for oral presentations. Oral presentations and responses to questions will be directed to the board.

(f) Public Comment. In addition, public comment on the application or registration and the proposed permit, approval, authorization or denial will be accepted.

(g) Upon consideration of the application or registration and the proposed permit, approval, authorization or denial at its meeting, the board may issue an order granting or denying an application or registration in whole or in part, dismissing proceedings, amending or modifying a proposed permit, or taking any other appropriate action.

§ 9.217 Action by Board on Applications Where There is a Right to a Contested Case Hearing But None Was Requested or Requests Were Withdrawn

(a) Applicability. This section applies only to all applications for groundwater withdrawal permits, groundwater exportation permits, and applications for a variance from well spacing limitations where, after the time for the filing of a hearing request provided in Section 9.307:

(1) no timely hearing request has been received;

(2) all timely hearing requests have been withdrawn; or

(3) the judge has remanded the application because of settlement.

(b) Scheduling the Board Meeting. Following the expiration of the time to file a hearing request pursuant to Section 9.307 of this chapter, and if all of the conditions stated in Subsection (a)(1)-(3) of this section have been met, the District will schedule the presentation of the application and the proposed permit, approval, authorization or denial to the board. The board may reschedule the presentation of the application and the proposed permit, approval, authorization or denial.

(c) Notice of Board Meeting. At least 10 days prior to the board meeting, the District will notify the applicant of the date of the board meeting referred to above via first class mail or hand delivery. If rescheduled by the board, the District will send notice of the rescheduled meeting date to the parties no later than ten days before the rescheduled meeting. In addition, the District will provide public notice that the application and the proposed permit, approval, authorization or denial will be considered by the board by including an item on the board's agenda pursuant to the Open Meetings Act. Copies of the application and the proposed permit, approval, authorization or denial will be made available to the public for inspection and copying

at the offices of the District during regular business hours.

(d) Consolidation or Severance of Matters. Consistent with notices required by law, the board may consolidate related matters if the consolidation will not injure any party and may save time and expense or otherwise benefit the public interest and welfare. The board may sever issues in a proceeding or hold special hearings on separate issues if doing so will not injure any party and may save time and expense or benefit the public interest and welfare.

(e) Oral Presentation Before the Board. The applicant and the general manager or his or her designee may make an oral presentation at the board meeting in which the application and the proposed permit, approval, authorization or denial are presented to the board. Oral presentations before the board will be limited to 15 minutes each, excluding time for answering questions, unless the president establishes other limitations. Before the board meeting, the president may allot time for oral presentations. Oral presentations and responses to questions will be directed to the board.

(f) Public Comment. In addition, public comment on the application and the proposed permit, approval, authorization or denial will be accepted.

(g) Upon consideration of the application and the proposed permit, approval, authorization or denial at its meeting, the board may issue an order granting or denying an application in whole or in part, dismissing proceedings, amending or modifying a proposed permit, or taking any other appropriate action.

§ 9.219 Notice of Permit Hearing Where There is a Right to a Contested Case Hearing

(a) Applicability. This section applies only to applications for groundwater withdrawal permits to authorize withdrawals from the Trinity Aquifer, groundwater exportation permits, and applications for a variance from well spacing limitations and relates to final permit hearings before the board.

(b) A notice of hearing on an application for a permit shall be prepared by the District. At a minimum, the notice shall state the following information:

(1) the name and address of the applicant;

(2) the name or names of the owner or owners of the land or well, if different from the applicant;

(3) the name or names of the operator or operators of the land or well, if different from the applicant;

(4) the date the application was filed and the number assigned to it;

(5) the time, date and location of the hearing;

(6) the address or approximate location of the well or proposed well;

(7) a brief explanation of the permit or permit amendment sought, including any requested amount of groundwater, the purpose of the proposed use, and any change in use;

(8) a summary of the action on the application recommended by the general manager pursuant to Section 9.213 of these rules;

(9) a statement of the legal authority and jurisdiction under which the hearing is to be held;

(10) a brief description of the technical summary;

(11) a statement that a copy of the proposed action, technical summary, and application are available for inspection by the public at the offices of the District;

(12) a statement that the application will be presented to the board for action at the hearing unless a request for a contested case hearing is submitted at least five days prior to the date of the hearing pursuant to Section 9.307; and

(13) a statement that the applicant or another affected person may request a contested case hearing on the application by filing a request with the District, at least five days before the date of the hearing, in accordance with 9.307.

(14) any other information the board or general manager considers relevant and appropriate.

(c) The District shall, not less than 20 days before the date of the hearing:

(1) Post the notice in a place readily accessible to the public at the District's office;

(2) Provide the notice for posting at the county courthouse to the county clerk of each county in which the District is located;

(3) Provide the notice:

(A) By regular mail to the applicant; and

(B) By regular mail, facsimile, or electronic mail to any person who has requested notice under Subsection (d) below; and

(4) Publish the notice at least once in a newspaper of general circulation in the District.

(d) Any person may request to receive written notice of permit hearings by submitting a request to the District in writing. The request must identify with as much specificity as possible the types of permit hearings for which written notice is requested. The request remains valid for the remainder of the calendar year in which the request is received by the District, after which time a new request must be submitted. An affidavit of an officer or

employee of the District establishing attempted service of notice by first class mail, facsimile, or electronic mail to a person required pursuant to Subsection (c)(3)(B), above, in accordance with the information provided by that person is proof that notice was provided by the District. Failure to provide notice under Subsection (c)(3)(B) does not invalidate an action taken by the District at the hearing.

(e) The applicant, at the applicant's expense, shall give the notification by first class mail to well owners and well operators within 1,000 feet of the well for which the application is sought, not less than twenty (20) days before the hearing. Prior to the hearing, the applicant will provide the District with proof of service including a list of names and addresses of the landowners, well owners and well operators.

§ 9.221 Scheduling of Permit Hearings Where There is a Right to a Contested Case Hearing

(a) Applicability. This section applies only to applications for groundwater withdrawal permits, groundwater exportation permits, and applications for variance from well spacing limitations and relates to final permit hearings before the board.

(b) Hearings on applications for permits may be scheduled during the District's regular business hours, Monday through Friday of each week, except District holidays and may be held in conjunction with a regularly scheduled board meeting. All permit hearings will be held at the District Office, unless the board directs otherwise. The District may from time to time schedule additional dates, times, and places for permit hearings by resolution adopted at a regular board meeting. The District may schedule as many applications for consideration at one hearing as deemed desirable and feasible.

Subchapter D. Contested Case Hearing Procedures

§ 9.301 Purpose

The purpose of this subchapter is to provide for the procedures to be applied to contested case hearings before the District.

§ 9.303 Applicability

This subchapter applies to matters subject to a contested case hearing under Section 9.219 for which a timely request for contested case hearing is pending before the District and the request has not been withdrawn because of settlement or for some other reason.

§ 9.305 Persons Entitled to Request a Contested Case Hearing

The following persons may request a contested case hearing on an application subject to this subchapter:

(a) the applicant; and

(b) any other affected person.

§ 9.307 Timing, Form and Contents of Requests for Contested Case Hearing

(a) A request for a contested case hearing may only be made for applications for groundwater withdrawal permits subject to a contested case hearing under § 9.219, groundwater exportation permits, and applications for a variance from well spacing limitations.

(b) A request for a contested case hearing must be in writing and be filed by United States mail, facsimile, or hand delivery to the District by no later than fourteen days before the date of the hearing specified in the notice made pursuant to Section 9.219.

(c) A hearing request must substantially include the following:

(1) the name, address, daytime telephone number, fax number, and electronic mail address of the person filing the request. If the request is made by a corporation, partnership, or other business entity, the request must identify the entity and one person by name, physical and mailing address, daytime telephone number, fax number, and electronic mail address, who shall be responsible for receiving all documents on behalf of the entity;

(2) the basis for the contention that the person will be injured and has a personal justiciable interest in the matter such that a contested case hearing is appropriate;

(3) a request for a contested case hearing;

(4) whether or not the requestor is seeking a hearing to be conducted by SOAH;

(5) provide any other information requested in the notice of hearing; and

(6) the person filing the request shall subscribe and swear or affirm under oath that the facts set out in the request are true and correct before any person entitled to administer oaths who shall also sign his or her name and affix his or her seal of office to the request.

(d) Where a request for a contested case hearing is filed by a person other than the applicant, a copy of that request must be served on the applicant at or before the time that the request is filed with the District. The request shall indicate the date and manner of service and the name and address of all persons served.

(e) If a person is requesting a contested case hearing on more than one application, a separate request must be filed in connection with each application.

§ 9.309 Processing of Hearing Requests

(a) Except as provided in Subsection (d), the general manager shall schedule any timely filed contested case hearing request for board consideration. At least seven days prior to the board hearing, the general manager shall provide notice to the applicant and other persons making a timely hearing request of the hearing. The board may receive relevant oral testimony or documentary evidence at a board hearing during which the contested case hearing request is evaluated.

(b) The hearing request will be the initial matter considered at the hearing on the permit application.

(c) Persons may submit a written response to the hearing request. Responses shall be filed with the District, the applicant and any persons filing a hearing request in connection with that matter. The response should address the question of whether the person requesting the contested case hearing has a personal justiciable interest related to the application at issue.

(d) The board shall evaluate the hearing request and any written responses thereto at the scheduled board hearing and shall determine that the person requesting the hearing:

(1) does not have a personal justiciable interest related to the application and deny the hearing request and not admit the person as a party to the hearing; or

(2) has a personal justiciable interest relating to the application, refer the application to a contested case hearing, and admit the person as a party to the hearing.

(e) The board may delegate to a presiding officer the processing of requests for contested case hearing.

(f) The determination of whether a hearing request should be granted is not itself a contested case hearing.

§ 9.311 General Hearing Procedures in Contested Cases

(a) Except for a hearing referred to SOAH, the procedures provided in this subchapter apply to contested case hearings. If the board refers a contested case hearing to

SOAH, then the hearing shall be conducted as provided by Subchapters C, D, and F, Chapter 2001, Government Code, and the applicable rules of practice and procedure of SOAH (Title 1, Chapter 155, Tex. Admin. Code, as may be amended) govern any contested case hearing of the District conducted by SOAH, as supplemented by this subchapter.

(b) A contested case hearing of the District must be conducted by either:

(1) a quorum of the board;

(2) an individual to whom the board has delegated in writing the responsibility to preside as a hearings examiner over the hearing or matters related to the hearing; or

(3) a SOAH administrative law judge.

(c) If requested by any party to a contested case, the District must contract with SOAH to conduct a contested case hearing.

(d) Except as provided by Subsection (d), the board president or the hearings examiner shall serve as the presiding officer at the hearing.

(e) If the hearing is conducted by a quorum of the board and the board president is not present, the directors conducting the hearing may select another director to serve as the presiding officer.

(f) Authority of presiding officer: The presiding officer may conduct the hearing in the manner the presiding officer deems most appropriate for the particular proceeding. The presiding officer has the authority to:

(1) convene the hearing at the time and place specified in the notice for public hearing;

(2) set hearing dates;

(3) designate the parties;

(4) establish the order for presentation of evidence;

(5) administer oaths to all persons presenting testimony;

(6) examine persons presenting testimony or comments;

(7) ensure that information and testimony are introduced as conveniently and expeditiously as possible, without prejudicing the rights of any party to the proceeding;

(8) prescribe reasonable time limits for testimony and the presentation of evidence;

(9) exercise the procedural rules of the District;

(10) issue subpoenas when required to compel the attendance of witnesses or the production of papers and documents;

(11) require the taking of depositions and compel other forms of discovery under these rules;

(12) reopen the record of a hearing for additional evidence when necessary to make the record more complete;

(13) establish the jurisdiction of the District concerning the subject matter under consideration;

(14) rule on motions and on the admissibility of evidence and amendments to pleadings;

(15) conduct public hearings in an orderly manner in accordance with these rules;

(16) recess any hearing from time to time and place to place; and

(17) exercise any other appropriate powers necessary or convenient to effectively carry out the responsibilities of the presiding officer.

(g) Alignment of Parties in a Contested Case Hearing; Number of Representatives Heard: Parties in a contested case hearing may be aligned according to the nature of the hearing and their relationship to it. The presiding officer may require the participants of an aligned class to select one or more persons to represent them in the hearing or on any particular matter or ruling and may limit the number of representatives heard, but must allow at least one representative of an aligned class to be heard in the proceeding or on any particular matter or ruling.

(h) Appearance by Applicant or Movant: The applicant, movant or party requesting the hearing or other proceeding or a representative should be present at the hearing or other proceeding. Failure to so appear may be grounds for withholding consideration of a matter and dismissal without prejudice or may require the rescheduling or continuance of the hearing or other proceeding if the presiding officer deems it necessary in order to fully develop the record.

(i) Reporting: Contested case hearings will be recorded by audio or video recording or, at the discretion of the presiding officer, may be recorded by a certified court reporter transcription. The District does not prepare transcripts of hearings or other proceedings recorded on audio cassette tape on District equipment for the public, but the District will arrange access to the recording. On the request of a party to a contested case hearing, the presiding officer shall have the hearing transcribed by a court reporter. The presiding officer may assess any court reporter transcription costs against the party that requested the transcription or among the parties to the hearing. Except as provided by this subsection, the presiding officer may exclude a party from further participation in a hearing for failure to pay in a timely manner costs assessed against that party under this subsection. The presiding officer may not exclude a party from further participation in a hearing as provided by this subsection if the parties have agreed that the costs

assessed against that party will be paid by another party. If a proceeding other than a contested case hearing is recorded by a reporter, and a copy of the transcript of testimony is ordered by any person, the testimony will be transcribed and the original of any transcript will be filed with the District and placed in the papers of the proceeding at the expense of the person requesting the transcript of testimony. Copies of the transcript of testimony of any hearing or other proceeding thus reported may be purchased from the reporter.

(j) Continuance: The presiding officer may continue hearings in a contested case hearing from time to time and from place to place without the necessity of publishing, serving, mailing or otherwise issuing a new notice under Section 9.219. If the presiding officer continues a contested case hearing without announcing at the hearing the time, date and location of the continued hearing, the presiding officer must provide notice of the continued hearing by regular mail to all parties.

§ 9.313 Conduct and Decorum

Every person participating in or observing a contested case hearing, or other associated proceeding, must conform to ethical standards of conduct and exhibit courtesy and respect for all other participants or observers. No person may engage in any activity during a proceeding that interferes with the orderly conduct of District business. If, in the judgment of the presiding officer, a person is acting in violation of this provision, the presiding officer shall first warn the person to refrain from engaging in such conduct. Upon further violation by the same person, the presiding officer may exclude that person from the proceeding for such time and under such conditions as the presiding officer deems necessary.

§ 9.315 Hearing Registration Forms

Each individual attending who provides comments or testimony in a contested case hearing shall submit a hearing registration form providing the following information: name, address, who the person represents, if the person is not there in person's individual capacity, whether the person plans to testify or provide comments, and any other information relevant to the hearing.

§ 9.317 Opportunity for Hearing and Participation; Notice of Hearing

(a) In a contested case, each party is entitled to an opportunity:

(1) for hearing; and

(2) to respond and to present evidence and argument on each issue involved in the case.

(b) Notice shall be provided not later than 14 days before the date of a contested case hearing to all parties to a contested case hearing and all persons who have requested a contested case hearing pursuant to Section 9.307 on which no action has been taken.

§ 9.319 Pre-Hearing Conferences

(a) The presiding officer may hold one or more pre-hearing conferences at which the presiding officer may consider any matter which may expedite the hearing or otherwise facilitate the hearing process.

(b) Matters Considered. Matters which may be considered at a pre-hearing conference include, but are not limited to:

(1) the withdrawal of protest;

(2) the designation of parties;

(3) the formulation and simplification of issues;

(4) the necessity or desirability of amending applications or other pleadings;

(5) the possibility of making admissions or stipulations;

(6) the scheduling of discovery;

(7) the identification of and specification of the number of witnesses;

(8) the filing and exchange of prepared testimony and exhibits; and

(9) the procedure at the hearing.

(c) Conference Action. Action taken at a pre-hearing conference may be reduced to writing and made a part of the record or may be stated on the record at the close of the conference.

§ 9.321 Designation of Parties

The following persons shall be designated as parties in a contested case hearing:

(a) The general manager of the District is a party in all contested case hearings;

(b) The applicant is a party in a contested case hearing on its application; and

(c) Any person who timely requested a contested case hearing pursuant to Section 9.307, and who has been determined by the presiding officer to be a person entitled to a contested case hearing under the standard set forth in Section 9.309.

§ 9.323 Right to Counsel

(a) Each party to a contested case hearing may have the assistance of legal counsel before the District.

(b) A party to a contested case hearing may choose not to have the assistance of legal

counsel.

§ 9.325 Interpreters for Deaf or Hearing Impaired Parties and Witnesses

(a) In a contested case hearing, the District shall provide an interpreter whose qualifications are approved by the Texas Office for Deaf and Hard of Hearing Services to interpret the proceedings for a party or subpoenaed witness who is deaf or hearing impaired.

(b) In this section, "deaf or hearing impaired" means having a hearing impairment, whether or not accompanied by a speech impairment, that inhibits comprehension of the proceedings or communication with others.

§ 9.327 Informal Disposition of Contested Case Hearing

An informal disposition may be made of a contested case hearing by:

(a) stipulation;

(b) agreed settlement;

(c) consent order; or

(d) default.

§ 9.329 Hearing Conducted by Hearings Examiner

(a) This section applies only to contested case hearings presided over by a hearings examiner.

(b) A hearings examiner who conducts a contested case hearing shall consider applicable District rules or policies in conducting the hearing.

(c) The District shall provide the hearings examiner with the District rules or policies applicable to the matter under consideration in the hearing.

(d) The District may not attempt to influence the findings of fact or the hearings examiner's application of law in a contested case hearing except by proper evidence and legal argument.

(e) The District may change a finding of fact or conclusion of law made by the hearings examiner, or may vacate or modify an order issued by the hearings examiner, only if the District determines:

(1) that the hearings examiner did not properly apply or interpret applicable law, District rules or policies provided under Subsection (c), or prior administrative decisions;

(2) that a prior administrative decision on which the hearings examiner relied is incorrect or should be changed; or

(3) that a technical error in a finding of fact should be changed.

The District shall state in writing the specific reason and legal basis for a change made under this subsection.

§ 9.331 Certified Questions

(a) At any time during a contested case hearing presided over by a hearings examiner, on a motion by a party or on the hearings examiner's own motion, the hearings examiner may certify a question to the District.

(b) Issues regarding District policy, jurisdiction or the imposition of any sanction by the hearings examiner that would substantially impair a party's ability to present its case are among the types of issues appropriate for certification. Policy questions for certification purposes include, but are not limited to:

(1) the District's interpretation of its rules and applicable statutes;

(2) which rules or statutes are applicable to a proceeding; or

(3) whether District policy should be established or clarified as to a substantive or procedural issue of significance to the proceeding.

(c) If a question is certified, the hearings examiner shall submit the certified issue to the general manager. The general manager will place the certified issue on the agenda of the earliest possible meeting of the board, in compliance with the Open Meetings Act and other applicable law. The general manager will give the hearings examiner and parties notice of the meeting at which the certified question will be considered. The parties to the proceeding may file with the District briefs on the certified question. Briefs shall be filed with the parties with a copy served on the hearings examiner. The general manager will provide copies of the certified question and any briefs to the board. The hearings examiner may abate the hearing until the District answers the certified question, or continue with the hearing if the hearings examiner determines that no party will be substantially harmed.

(d) The District will issue a written decision on the certified issue within 30 days following the meeting at which the certified issue is considered. A decision on a certified issue is not subject to a motion for rehearing, appeal or judicial review prior to the issuance of the District's final decision in the proceeding.

§ 9.333 Service of Documents filed in a Contested Case Hearing

(a) Service of all Documents Required. For any document filed with the District or the judge in a contested case hearing, the person filing that document must serve a copy on all parties to the contested case including the general manager at or before the time that the request is filed.

(b) Certificate of Service. A document presented for filing must contain a certificate of service indicating the date and manner of service and the name and address of each person

served. The docket clerk may permit a document to be filed without a certificate of service but will require the certificate to be filed promptly thereafter.

§ 9.335 Privilege

In a contested case hearing, the District shall give effect to the rules of privilege recognized by law.

§ 9.337 Objections to Evidence

An objection to an evidentiary offer in a contested hearing may be made and shall be noted in the record.

§ 9.339 Burden of Proof

The burden of proof is on the applicant to establish, by a preponderance of the evidence, that the applicant is entitled to have the application granted.

§ 9.341 Assessing Costs

(a) The party or parties requesting a contested case hearing before SOAH shall pay all costs associated with the contract for the hearing and shall deposit with the District an amount sufficient to pay the contract amount before the hearing begins. At the conclusion of the hearing, the District shall refund any excess money to the paying party or parties.

(b) Upon the timely request of any party, or at the discretion of the presiding officer, the presiding officer may make a recommendation to the board regarding the assessment of costs incurred by the District for the hearing not addressed in Subsection (a), including the District's expenditures for attorney's fees and technical experts, and any reporting and transcription costs to one or more of the parties. If the hearing is conducted by the board, a hearing report with recommendations need not be filed, and the board may directly assess the District's hearing costs and reporting and transcription costs to one or more of the parties. The presiding officer must consider the following factors in assessing the District's hearing costs not addressed in Subsection (a) and the reporting and transcription costs:

(1) the party who requested the hearing and/or transcript;

(2) the financial ability of the party to pay the costs;

(3) the extent to which the party participated in the hearing;

(4) the relative benefits to the various parties of having a transcript;

(5) the budgetary constraints of a governmental entity participating in the proceeding; and

(6) any other factor that is relevant to a just and reasonable assessment of costs.

(c) In any proceeding where the assessment of the District's hearing costs and reporting or transcription costs is an issue, the presiding officer must provide the parties an opportunity to present evidence and argument on the issue. If applicable, a recommendation regarding the assessment of costs must be included in the hearing presiding officer's report to the board.

§ 9.343 Rights of Designated Parties

Subject to the direction and orders of the presiding officer, parties have the right to conduct discovery; present a direct case; cross-examine witnesses; make oral and written arguments; obtain copies of all documents filed in the proceeding; receive copies of all notices issued by the District concerning the proceeding; and otherwise fully participate in the proceeding.

§ 9.345 Persons Not Designated Parties

At the discretion of the presiding officer, a person not designated as a party to a proceeding may submit a comment or statement, orally or in writing. Comments or statements submitted by non-parties may be included in the record, but may not be considered by the presiding officer.

§ 9.347 Ex Parte Communications

Except as otherwise provided below, the presiding officer or a member of the board assigned to render a decision or to make findings of fact or conclusions of law on a contested permit application may not communicate, directly or indirectly, about any issue of fact or law during the pendency of the contested case with any representative of the District or other designated party to the contested case, except on notice and opportunity for all parties to participate. This rule does not apply to a board member who abstains from voting on any matter in which he or she engaged in ex parte communications. A member of the board may communicate ex parte with other members of the board consistent with the requirements of other law, such as the Open Meetings Act. A member of the board or the presiding officer may communicate ex parte with a District employee who has not participated in any hearing in the contested case for the purpose of using the special skills or knowledge of the District employee in evaluating the evidence.

§ 9.349 Evidence

The presiding officer shall admit evidence that is relevant to an issue at the hearing. The presiding officer may exclude evidence that is irrelevant, immaterial, or unduly repetitious. The Texas Rules of Evidence may be referred to in order to determine the admissibility and introduction of evidence in contested case hearings. However, evidence not admissible under the Texas Rules of Evidence may be admitted if the evidence is:

(a) necessary to ascertain facts not reasonably susceptible of proof under those rules;

(b) not precluded by statute; and

(c) of a type on which a reasonably prudent person commonly relies in the conduct of the person's affairs.

In addition, evidence may be stipulated to by agreement of all parties.

§ 9.351 Written Testimony

(a) When a proceeding will be expedited and the interests of the parties will not be prejudiced substantially thereby, the presiding officer may allow testimony in a contested case hearing to be received in written form.

(b) The written testimony of a witness, either in narrative or question and answer form, must be sworn to by the witness and may be admitted into evidence upon the witness being sworn and identifying the testimony as a true and accurate record of what the testimony would be if given orally. The witness must be available, in person, by phone, or by other reasonable means, for clarifying questions and cross-examination, and the prepared testimony will be subject to objection. On the motion of a party, the presiding officer may exclude written testimony if the person who submits the testimony is unavailable for cross-examination by phone, a deposition before the hearing, or other reasonable means.

§ 9.353 Requirements for Exhibits

(a) Exhibits of a documentary character must be sized to not unduly encumber the files and records of the District. All exhibits must be numbered and, except for maps and drawings, may not exceed 8-1/2 by 11 inches in size.

(b) Abstracts of Documents. When documents are numerous, the presiding officer may receive in evidence only those which are representative and may require the abstracting of relevant data from the documents and the presentation of the abstracts in the form of an exhibit. Parties have the right to examine the documents from which the abstracts are made.

(c) Introduction and Copies of Exhibits. Each exhibit offered must be tendered for identification and placed in the record. Copies must be furnished to the presiding officer and to each of the parties, unless the presiding officer rules otherwise.

(d) Excluding Exhibits. In the event an exhibit has been identified, objected to, and excluded, it may be withdrawn by the offering party. If withdrawn, the exhibit will be returned and the offering party waives all objections to the exclusion of the exhibit. If not withdrawn, the exhibit will be included in the record for the purpose of preserving the objection to excluding the exhibit.

§ 9.355 Official Notice; District Evaluation of Evidence

(a) In connection with a contested case hearing, the presiding officer may take official notice of:

(1) all facts that are judicially cognizable; and

(2) generally recognized facts within the area of the District's specialized knowledge.

(b) Each party shall be notified, either before or during the hearing, or by reference in a preliminary report or otherwise, of the material officially noticed, including staff memoranda or information.

(c) Each party is entitled to be given an opportunity to object to material that is officially noticed.

§ 9.357 Agreement of Parties; Remand to Board

(a) No agreement between parties or their representatives affecting any pending matter shall be considered by the presiding officer unless it is in writing, signed, and filed as part of the record, or unless it is announced at the prehearing conference or the hearing and entered of record.

(b) An agreed disposition of a contested case may be made by stipulation, settlement, consent order, or the withdrawal of all requests for a contested case hearing so that no facts or issues remain controverted. Upon settlement of a matter, the presiding officer shall remand the matter to the board. If the person requesting the contested case hearing defaults, then the presiding officer may also deem the request for a contested case hearing to have been withdrawn by the person and remand the case to the board. Applications remanded under this section shall be considered to be uncontested and shall be considered under Section 9.215. The presiding officer shall summarize the evidence, including findings of fact and conclusions of law based on the existing record and any other evidence submitted by the parties at the hearing. Any stipulations, settlements, consent orders, withdrawals of requests for contested case hearing, orders, findings of default, presiding officer summary of the proceedings, and other relevant documents shall be presented to the board for its consideration.

§ 9.359 Discovery

Discovery may be conducted upon such terms and conditions, and at such times and places, as directed by the presiding officer. Unless specifically modified by this subchapter or by order of the presiding officer, discovery shall be governed by, and subject to the limitations set forth in, the Texas Rules of Civil Procedure. In addition to the forms of discovery authorized under the Texas Rules of Civil Procedure, the parties may exchange informal requests for information, either by agreement or by order of the presiding officer.

§ 9.361 Documents in District Files

Extrinsic evidence of authenticity is not required as a condition precedent to admissibility of documents maintained in the files and records of the District.

§ 9.363 Oral Argument

At the discretion of the presiding officer, oral arguments may be heard at the conclusion of the presentation of evidence. Reasonable time limits may be prescribed. The presiding officer

may require or accept written briefs in lieu of, or in addition to, oral arguments. When the matter is presented to the board for final decision, further oral arguments may be heard by the board if the board did not preside over the hearing.

§ 9.365 Closing the Record

At the conclusion of the presentation of evidence and any oral argument, the presiding officer may close the record or, if the board has not taken final action on the application, keep it open and allow the submission of additional testimony by a person who testified at the hearing, or exhibits, briefs, or proposed findings and conclusions from one or more of the parties. Any supplementation of the record must be filed not later than the 10th day after the date of the final hearing. A person who files additional written material with the presiding officer under this section must also provide the material, not later than the 10th day after the date of the hearing, to any person who provided comments on an uncontested application or any party to a contested case hearing. A person who receives additional written material under this section may file a response to the material with the presiding officer not later than the 10th day after the date the material was received. No additional evidence, exhibits, briefs, or proposed findings and conclusions may be filed unless permitted or requested by the presiding officer.

§ 9.367 Proposal for Decision

Except for contested cases presided over by a quorum of the board, no later than 30 days following the completion of the contested case hearing, the presiding officer shall submit a proposal for decision to the District and serve a copy on the applicant and each designated party to the contested case. A proposal for decision shall include a summary of the subject matter of the hearing, a summary of the evidence or public comments received, and the presiding officer's recommendations for board action on the subject matter of the hearing. The presiding officer, when submitting the proposal for decision, shall notify the parties of the deadlines for the filing of exceptions and replies.

§ 9.368 Exceptions to the Proposal for Decision

Prior to board action, any party in a contested case may file written exceptions to the proposal for decision. Upon review of the exceptions, the hearing examiner may reopen the record for the purpose of developing additional evidence, or may deny the exceptions and submit the proposal for decision and exceptions to the board. The board may, at any time and in any case, remand the matter to the hearing examiner for further proceedings.

§ 9.369 Scheduling a Meeting of the Board

(a) After receiving the proposal for decision or proposed order, the general manager shall schedule the presentation of the proposal for decision or proposed order to the board. The general manager shall provide at least 10 days' prior notice to the parties of the date of the board meeting at which the proposal for decision or proposed order will be presented and considered. The board may reschedule the presentation of the proposal for decision or proposed order. The general manager shall send notice of the rescheduled meeting date to the parties no later than 10 days before the rescheduled meeting.

(b) Consistent with notices required by law, the board may consolidate related matters if the consolidation will not injure any party and may save time and expense or otherwise benefit the public interest and welfare.

(c) The board may sever issues in a proceeding or hold special hearings on separate issues if doing so will not injure any party and may save time and expense or benefit the public interest and welfare.

§ 9.371 Oral Presentation Before the Board

(a) Any party to the contested case hearing may make an oral presentation at the board meeting in which the proposal for decision in that case is presented to the board.

(b) Any party to the contested case hearing may make an oral presentation at the board meeting in which the proposed order in that case is considered by the board.

(c) Oral presentations before the board shall be limited to 5 minutes each, excluding time for answering questions, unless the president establishes other limitations. Before the board meeting, the president may allot time for oral presentations. Oral presentations and responses to questions shall be directed to the board.

§ 9.373 Reopening the Record

The board, on the motion of any party to a contested case or on its own motion, may order the presiding officer to reopen the record for further proceedings on specific issues in dispute. The order shall include instructions as to the subject matter of further proceedings and the presiding officer's duties in preparing supplemental materials or revised proposals based upon those proceedings for the board's adoption.

§ 9.375 Decision

(a) No later than 60 days after the date of the final hearing on the application is concluded, the board shall render its decision. The decision, if adverse to any party, must be in writing or stated in the record. If a written request is filed with the District not later than the 20th day after the date of the board's decision, then the board's decision must be in writing and shall include findings of fact and conclusions of law separately stated regarding the decision of the board. The board shall provide certified copies of the findings and conclusions to the person who requested them, and to each person who provided comments or each designated party, not later than the 35th day after the date the board received the request.

(b) The board's decision shall be rendered no later than 60 days after the date the final hearing on the application is concluded, unless the board determines that there is good cause for continuing the proceeding.

(c) The board may change a finding of fact or conclusion of law made by the presiding officer, or may vacate or modify an order issued by the presiding officer, only if the board determines:

(1) that the presiding officer did not properly apply or interpret applicable law, District rules, written policies provided to the presiding officer by the District, or prior administrative decisions:

(2) that a prior administrative decision on which the presiding officer relied is incorrect or should be changed; or

(3) that a technical error in a finding of fact should be changed.

§ 9.377 Notification of Decisions and Orders

(a) The District shall notify all parties in a contested case either personally or by certified mail, return-receipt requested, of any decision or order.

(b) The District shall send a copy of the decision or order in a contested case by first-class mail to attorneys of record and shall keep an appropriate record of the mailing. If a party is not represented by an attorney, the District shall send a copy of the decision or order by first-class mail to the party and shall keep an appropriate record of the mailing.

(c) A party or attorney of record notified by mail under Subsection (b) is presumed to have been notified on the third day after the date on which the notice is mailed.

§ 9.379 Motion for Rehearing

(a) Filing motion. Only a party to the contested case may file a motion for rehearing. The motion shall be filed with the general manager within 20 days after the date the party or his or her attorney of record is notified of the decision or order. On or before the date of filing of a motion for rehearing, a copy of the motion shall be mailed or delivered to all parties with certification of service furnished to the District. The motion shall contain:

(1) the name and representative capacity of the person filing the motion;

(2) the style and official docket number assigned by the District;

(3) the date of the decision or order; and

(4) a concise statement of each allegation of error.

(b) Reply to motion for rehearing. Only a party to the contested case proceeding may reply to a motion for rehearing. A reply to a motion for rehearing must be filed with the general manager within 20 days after the date the motion for rehearing is filed.

(c) Ruling on motion for rehearing.

(1) Upon the request of a board member, the motion for rehearing shall be scheduled for consideration during a board meeting. Unless the board rules on the motion for rehearing, the failure of the board to grant or deny a request for rehearing before the 91st day after the date the request is submitted constitutes a denial of the request by operation of law.

(2) A motion for rehearing may be granted in whole or in part. When a motion for rehearing is granted, the decision or order is nullified. The board may reopen the hearing to the extent it deems necessary. If the board grants a request for rehearing, the board shall schedule the rehearing not later than the 45th day after the date the request is granted. Thereafter, the board shall render a decision or order as required by this subchapter.

§ 9.381 Decision Final and Appealable

In the absence of a timely filed motion for rehearing, a decision or order of the board is final and appealable on the expiration of the period for filing a motion for rehearing. If a party files a timely motion for rehearing, a decision or order of the board is final and appealable on the date: (1) the board denies the motion for rehearing; (2) the motion is denied by operation of law; or (3) the board renders a written decision after rehearing.

§ 9.383 Appeal of Final Decision

(a) A filing of a timely motion for rehearing is a prerequisite to appeal.

(b) Not later than the 60th day after the date on which the decision of the board becomes final, an applicant or a party to a contested case hearing may appeal the District's decision by filing suit under Section 36.251, Texas Water Code. An applicant or a party to a contested case hearing may not file suit against the District under Section 36.251 if a request for rehearing was not filed on time.

(c) The record. The record in a contested case shall include the following:

(1) all pleadings, motions and intermediate rulings;

(2) evidence received or considered;

(3) a statement of matters officially noticed;

(4) questions and offers of proof, objections and rulings on them;

(5) summaries of the results of any conferences held before or during the hearing;

(6) proposed findings, exceptions and briefs;

(7) any decision, opinion or report issued by the presiding officer;

(8) pre-filed testimony;

(9) all memoranda or data submitted to or considered by the presiding officer; and

(10) the final order and all interlocutory orders.

§ 9.385 Costs of Record on Appeal

A party who appeals a final decision in a contested case shall pay all costs of preparation of the record of the proceeding that is required to be transmitted to the reviewing court. A charge imposed as provided by this section is considered to be a court cost and may be assessed by the court in accordance with the Texas Rules of Civil Procedure.

Subchapter E. Procedures for Adoption of Rules and Management Plan

§ 9.401 Rulemaking and Management Plan Hearing Procedures

(a) The District shall adopt rules and its management plan following the notice and hearing procedures set forth in this subchapter.

(b) Not later than the 20th day before the date of a hearing to adopt rules or a management plan, the general manager shall provide notice of the public hearing as follows:

(1) post a notice in a place readily accessible to the public at the District office;

(2) provide a copy of the notice to the county clerk of each county in which the District is located, to be posted at the County courthouse;

(3) publish the notice in one or more newspapers of general circulation in the District;

(4) provide the notice by mail, facsimile, or electronic mail to any person who has requested the notice pursuant to Subsection (g); and

(5) make available a copy of the proposed rule or management plan at a place accessible to the public during normal business hours and, if the District has a website, post an electronic copy on its website.

(c) The notice shall include the following information:

(1) the time, date, and location of the rulemaking or management plan hearing;

(2) a brief explanation of the subject of the rulemaking or management plan hearing; and

(3) the procedures for submitting oral or written comments, and a location or internet site at which a copy of the proposed rules or management plan may be reviewed or copied, if any.

(d) The general manager may designate a person to be the presiding officer to conduct the public hearing. The presiding officer shall conduct a rulemaking or management plan hearing in the manner the presiding officer determines to be most appropriate to obtain information and comments relating to the proposed rule or management plan as conveniently and expeditiously as possible. Comments may be submitted orally at the hearing or in writing. The presiding officer may hold the record open for a specified period after the conclusion of the hearing to receive additional written comments. The District shall allow at least 20 days for submission of written public comments on a proposed rule or management plan before adopting the proposed rule or plan.

(e) Any person participating in a rulemaking hearing must submit to the District a registration form indicating the person's name, address, and who the person represents, if not in attendance or his or her behalf.

(f) The presiding officer shall prepare and keep a record of each rulemaking or management plan hearing in the form of an audio or video recording or a court reporter transcription.

(g) A person may submit to the District a written request for notice of a rulemaking or management plan hearing. A request is effective for the remainder of the calendar year in which the request is received by the District. To receive notice of a rulemaking or management plan hearing in a later year, a person must submit a new request. An affidavit of an officer or employee of the District establishing attempted service by first class mail, facsimile, or electronic mail to the person in accordance with the information provided by the person is proof that notice was provided by the District.

(h) The District may use an informal conference or consultation to obtain the opinions and advice of interested persons about a contemplated rule or management plan provision and may appoint an advisory committee of experts, interested persons, or public representatives to advise the District about a contemplated rule or management plan provision.

(i) Failure to provide notice under Subsection (b)(4) does not invalidate an action taken by the District at a rulemaking or management plan hearing.

(j) Oral Presentations. Any person desiring to testify on the subject of the hearing must so indicate on the registration form provided at the hearing. The presiding officer may establish the order of testimony and may limit the number of times a person may speak, the time period for oral presentations, and the time period for raising questions. In addition, the presiding officer may limit or exclude cumulative, irrelevant, or unduly repetitious presentations.

(k) Adoption of Proposed Rules or Management Plan. After the conclusion of the hearing and the time period for submission of written comments, the board shall consider all timely written comments and shall, in the order adopting the rule or plan, state the District's responses to the written comments.

(l) A proposed rule becomes final and effective on the day it is adopted by the board, unless otherwise specified by the board.

§ 9.402 Adoption of Desired Future Conditions Hearing Procedures

(a) Not later than the 20th day before the date of a hearing or meeting at which the District will adopt a desired future condition for any aquifer, the District shall provide notice of the public hearing or meeting as follows:

(1) post a notice in a place readily accessible to the public at the District office;

(2) provide a copy of the notice to the county clerk of each county in which

the District is located, to be posted at the County courthouse;

(3) publish the notice in one or more newspapers of general circulation in the District;

(4) provide the notice by mail, facsimile, or electronic mail to any person who has requested a notice pursuant to Section 9.401(g) or who has made such a request related specifically to the adoption of a desired future condition; and

(5) make available a copy of the proposed desired future condition at a place accessible to the public during normal business hours and, if the District has a website, post an electronic copy on its website.

(b) At least 10 days before a hearing or meeting at which the District will adopt a desired future condition for any aquifer, the District must post notice that includes:

(1) the proposed desired future conditions and a list of any other agenda items;

(2) the date, time, and location of the meeting or hearing;

(3) the name, telephone number, and address of the person to whom questions or requests for additional information may be submitted;

(4) the names of the other districts in the District's management area; and

(5) information on how the public may submit comments.

§ 9.403 Emergency Rulemaking

(a) The District may adopt an emergency rule without prior notice or hearing, or with an abbreviated notice and hearing, if the board:

(1) finds that a substantial likelihood of imminent peril to the public health, safety, or welfare, or a requirement of state or federal law, requires adoption of a rule on less than 20 days' notice; and

(2) prepares a written statement of the reasons for its findings under Subsection (a).

(b) Except as provided by Subsection (c), a rule adopted under this section may not be effective for longer than 90 days.

(c) If notice of a hearing on the final rule is given not later than the 90th day after the date the rule is adopted, the rule is effective for an additional 90 days.

(d) A rule adopted under this section must be adopted at a meeting held as provided by the Open Meetings Law.

CHAPTER 10. WATER QUALITY

§ 10.1 Prohibition on Pollution of Groundwater

A person may not pollute or contribute to the pollution of groundwater in the District.

CHAPTER 11. INVESTIGATIONS AND ENFORCEMENT

§ 11.1 Right to Enter Land

(a) Any District board member or District employee, agent or representative is entitled to enter any public or private property within the boundaries of the District at any reasonable time for the purpose of inspecting or investigating conditions relating to the quality or quantity of groundwater or in regard to the compliance with the District Act, Chapter 36 of the Texas Water Code, or any rule, permit, or order of the District. Such persons acting under this authority who enter private property shall, prior to entry, give notice in writing or in person or by telephone to the owner, lessee, or operator, agent, or employee of the property, as determined by information contained in the application or other information on file with the District, if any.

(b) If the District attempts to gain access to property to conduct an inspection in accordance with Subsection (a), and is unable to do so due to a lock, after providing notice to the well owner and an opportunity for the well owner to be heard on the matter at a District board meeting, the District may install an additional lock at the property in order to access the well.

§ 11.3 Conduct of Investigation

Investigations or inspections that require entrance upon property must be conducted at reasonable times, and must be consistent with the establishment's rules and regulations concerning safety, internal security, and fire protection. The persons conducting such investigations must identify themselves and present credentials upon request of the owner, lessee, operator, or person in charge of the property.

§ 11.5 Judicial Civil Enforcement

(a) The District may enforce the District Act or its rules by injunction, mandatory injunction, or other appropriate remedy in a court of competent jurisdiction.

(b) If the District prevails in any suit to enforce its rules, the District may seek and the court shall grant, in the same action, civil penalties, recovery for attorney's fees, costs for expert witnesses, and other costs incurred by the District before the court.

(c) Civil penalties for breach of any rule of the District shall be not less than $100 per day per violation and not more than $10,000 per day per violation.

(d) A penalty under this section is in addition to any other penalty provided by the law of this state and may be enforced by complaint filed in an appropriate court of jurisdiction in the District.

§ 11.7 Enforcement Action by the General Manager

If the general manager determines that a person, or his predecessor in interest, is in violation of the District Act, these Rules, or the terms or conditions of a permit or interim production status, he may suspend the processing of any application or authorization that the person has pending before the District.

§ 11.9 Enforcement Action by the Board

If the board determines that a person, or his predecessor in interest, violated, is violating, or is threatening to violate the District Act, these Rules, or the terms or conditions of a permit or interim production status, it may, after providing a 10-day written notice to the person and an opportunity for the person to appear and be heard at a meeting of the board:

(a) suspend the processing of any application or authorization that the person has pending before the District, until the violation is remedied;

(b) suspend any interim production status, permit or authorization issued by the District, which is held by that person, until the violation is remedied;

(c) commence any action authorized by law to address the violation, including filing a civil suit in state district court seeking an injunction, a mandatory injunction, civil penalties, and attorney's fees and other costs associated with bringing a suit; or

(d) enter into, or authorize the general manager to enter into, a settlement agreement with the person.

§ 11.11 Enforcement Related to Groundwater Withdrawal Limitations

(a) If the board determines that the holder of a HUPP has exceeded the annual authorized withdrawal amount in the permit, the board may suspend taking enforcement action for a period of time in order to determine whether the holder of the permit has average annual withdrawals over a three-year period in excess of the permit's annual authorized withdrawal amount.

(b) If the board determines that the holder of a HUPP has annual withdrawals over a three-year period in excess of the permit's annual authorized withdrawal amount, the general manager and the board may commence any enforcement action authorized by these rules and other law to enforce the terms of the permit.

RESOLUTION AND ORDER NO. 2021-003

OF THE BOARD OF DIRECTORS OF THE SOUTHERN TRINITY GROUNDWATER CONSERVATION DISTRICT READOPTING SOUTHERN TRINITY GROUNDWATER CONSERVATION DISTRICT MANAGEMENT PLAN.

Whereas, the Southern Trinity Groundwater Conservation District ("District") was created in 2007 by the Texas Legislature, Act of May 26, 2007, 80th Leg., R.S., ch. 1345, 2007 Tex. Gen. Laws 4594 (then the "McLennan County Groundwater Conservation District"), which act was amended in 2009 by Act of May 31, 2009, 81st Leg., R.S. ch. 1248, 2009 Tex. Gen. Laws 3976, and by Act of May 5, 2011, 82nd Leg., R.S. ch. 58, 2011 Tex. Gen. Laws 92, and codified in Texas Special District Local Laws Code, Chapter 8821 ("Act");

WHEREAS, the District has "all of the rights, powers, privileges, authority, functions, and duties," provided by Chapter 36, Texas Water Code. Act § 8821.101;

WHEREAS, the District was created "to provide for the conservation, preservation, protection, recharging, and prevention of waste of groundwater . . ." Tex. Water Code Ann. § 36.0015;

WHEREAS, Section 36.1071(a) of the Texas Water Code requires the District to, in coordination with surface water management entities in the region, to develop a management plan, which addresses the following applicable management goals:

(1) providing the most efficient use of groundwater;
(2) controlling and preventing waste of groundwater;
(3) controlling and preventing subsidence;
(4) addressing conjunctive surface water management issues;
(5) addressing natural resource issues;
(6) addressing drought conditions;
(7) addressing conservation, recharge enhancement, rainwater harvesting, precipitation enhancement, or brush control, where appropriate and cost-effective; and
(8) addressing the desired future conditions adopted by the District under Section 36.108;

WHEREAS, the District adopted a management plan on January 7, 2010, and readopted its management plan on April 23, 2015;

WHEREAS, the Texas Water Code requires that the District review and readopt its management plan with or without revisions at least once every five years. Tex. Water Code Ann. § 36.1072(e);

WHEREAS, the Texas Water Code requires that the management plan use the best data available to the District and that it be forwarded to the regional water planning group for use in its planning process. Tex. Water Code Ann. § 36.1071(b);

WHEREAS, in accordance with Section 36.1071(h) of the Texas Water Code, in developing the management plan, the District used the groundwater availability modeling information provided by the Texas Water Development Board together with available site-specific information provided by the District to the Texas Water Development Board for review and comment before being used in the plan;

WHEREAS, the management plan complies with Section 36.1071(e) of the Texas Water Code as it: (1) identifies the performance standards and management objectives under which the District will operate to achieve the identified management goals; (2) specifies the actions, procedures, performance, and avoidance that are or may be necessary to effect the plan, including specifications and proposed rules; (3) includes estimates of: the modeled available groundwater in the District based on the desired future condition established under Section 36.108 of the Texas Water Code, the amount of groundwater being used within the District on an annual basis, the annual amount of recharge from precipitation to groundwater resources within the District, for each aquifer, the annual volume of water that discharges to springs and any surface water bodies, the annual volume of flow into and out of the District within each aquifer and between aquifers in the District, the projected surface water supply in the District according to the most recently adopted state water plan; and the projected total demand for water in the District according to the most recently adopted state water plan; and (4) considers the water supply needs and water management strategies included in the adopted state water plan;

WHEREAS, the District is statutorily obligated to require a permit for the operation of any non-exempt well withdrawing groundwater in the District. Tex. Water Code Ann. § 36.113. In accordance with its obligations to manage groundwater within its jurisdiction under the Act and Chapter 36 of the Water Code, the District has determined that the Brazos Alluvium Aquifer is the source of non-exempt groundwater withdrawals in the District and has issued permits for the withdrawal of non-exempt groundwater from the Aquifer within the District. Notwithstanding, Groundwater Management Area 8 did not adopt a desired future condition for the Brazos Alluvium Aquifer in McLennan County as part of the regional planning process, despite the District managing groundwater withdrawals from the Aquifer within McLennan County. As a result, the Texas Water Development Board has not generated an official modeled available groundwater number for the Aquifer within the District. The District, however, continues to use the modeled available groundwater number determined in 2010 as evidence of availability of groundwater from the Aquifer;

WHEREAS, pursuant to Tex. Water Code Ann. § 36.1071(g) and Section 9.401 of the District's rules, the District provided notice of the public hearing held on the proposed management plan by, at least 20 days before the hearing: posting the notice in a place readily accessible to the public at the District's office; providing the notice to the McLennan County Clerk; publishing the notice in the *Waco-Tribune Herald*, a newspaper of general circulation in McLennan County; providing the notice by mail, facsimile, or electronic mail to those persons who have requested notice; and making available a copy of the proposed management plan at a place accessible to the public during normal business hours;

WHEREAS, pursuant to § 36.1071(g), Tex. Water Code Ann. and Section 9.401 of the District's rules, the District held a public hearing at which the public was allowed to make comments on the proposed management plan;

WHEREAS, pursuant to § 36.064(b), Tex. Water Code Ann., the public hearing was conducted at an open meeting in accordance with the Texas Open Meetings Act;[1]

WHEREAS, pursuant to Section 9.401(d), the District allowed at least 20 days for the submission of written comments on the proposed management plan and no comments were submitted;

WHEREAS, the District has prepared the management plan as attached hereto as Exhibit A and incorporated for all purposes; and

WHEREAS, the Board has reviewed the management plan and finds that it is consistent with the District's statutory authority and should be readopted.

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

Section 1. The Management Plan, which is attached to this Resolution and Order as A, is hereby readopted as the Management Plan by the Board.

Section 2. The Management Plan shall become effective on the date of approval by the executive director of the Texas Water Development Board.

PASSED AND APPROVED BY THE BOARD OF DIRECTORS OF THE SOUTHERN TRINITY GROUNDWATER CONSERVATION DISTRICT THIS 15TH DAY OF JULY, 2021.

Rodney Kroll
President, Board of Directors

ATTEST:

Glen Thurman
Secretary, Board of Directors

[1] Tex. Gov't Code Ann. §§551.001-551.146.

APPROVED AS TO FORM:

Deborah Trejo
Kemp Smith LLP, General Counsel

NOTICE OF PUBLIC HEARING
ON PROPOSED GROUNDWATER MANAGEMENT PLAN

The Southern Trinity Groundwater Conservation District (District) will conduct a public hearing concerning the District's proposed readoption of its groundwater management plan. The purpose of the notice and hearing is to provide interested members of the public the opportunity to provide oral or written comments to the District related to the proposed plan.

1.0 Date, Time, and Place of Public Hearing.

Date:	Thursday, July 15, 2021
Time:	12:00 p.m.
Location:	District Office 824 Washington Avenue Waco, Texas

THE STATE OF TEXAS
COUNTY OF McLENNAN

This is to certify that the Notice of a Meeting, a copy of which is attached hereto, was posted on the official bulletin board at the Courthouse, as required by Article 62.52-17 V. T. C. S.

11:02 Am

Executed on June 9, 2021

J. A. "Andy" Harwell, County Clerk
McLennan County, Texas

By _____ Deputy

2.0 Brief Explanation of the Proposed Management Plan

The District is proposing to readopt its management plan, which is intended to implement the District's organic act and mandates of Chapter 36 of the Texas Water Code. Among other things, the proposed management plan will address the following management goals for the Trinity Aquifer and the Brazos Alluvium Aquifer within McLennan County:

(1) providing the most efficient use of groundwater;
(2) controlling and preventing waste of groundwater;
(3) controlling and preventing subsidence;
(4) addressing conjunctive surface water management issues;
(5) addressing natural resource issues;
(6) addressing drought conditions;
(7) addressing conservation, recharge enhancement, rainwater harvesting, precipitation enhancement, or brush control, where appropriate and cost-effective; and
(8) for the Trinity Aquifer only, addressing the desired future conditions adopted by the District.

All interested persons are encouraged to review the proposed plan for themselves by obtaining a copy from the District, as provided below.

3.0 Procedures for Obtaining the Proposed Management Plan

Copies of the proposed management plan may be obtained from the District as follows:

1. by calling (254) 759-5610, and requesting a copy of the proposed management plan from the District's General Manager; or
2. by visiting the offices of the District at 824 Washington Avenue, Waco, Texas between 8 a.m. and 12 p.m.; or
3. by requesting the proposed management plan by electronic mail sent to stgcd@stgcd.org; or
4. from the District's website: http://southerntrinitygcd.org.

4.0 Procedures for Submitting Comments on the Proposed Management Plan

4.1 Oral Comments

Any person who desires to provide oral comments must submit a registration form provided by the District at the public hearing, indicating who the person represents, if not providing oral comments on his or her own behalf. The presiding officer may establish the order of oral comments and may limit the number of times a person may speak, the time period for oral comments and for raising questions. The presiding officer may also limit or exclude cumulative, irrelevant, or unduly repetitious oral comments.

4.2 Written Comments

The District encourages all interested parties to submit written comments regarding the proposed management plan. Written comments on the proposed management plan must be filed with the District by no later than July 12, 2021 at 12 p.m. Written comments may be filed as follows:

1. by hand delivery to the District's general manager at the District's offices, 460 N. 6th Street, Waco, Texas during regular business hours Monday through Friday from 8 am to 12 pm; or
2. by mail to the District at P. O. Box 2205, Waco, Texas 76703; or
3. by electronic mail to stgcd@att.net.

Written comments should be filed on 8 1/2 x 11 inch paper and typed or legibly written.

5.0 Opportunity to Appear and Comment at Board Meeting at Which the Proposed Management Plan May be Adopted as Final

The meeting of the District's Board of Directors at which the proposed management plan will be considered for adoption as final will be immediately following the public hearing and will be an open meeting and, at that meeting, the public will be allowed to make comments on the proposed management plan, subject to whatever reasonable limits as to the number, frequency and length of comments the District is empowered to impose pursuant to the Texas Open Meetings Act, TEX. GOV'T CODE ANN. ch. 551.

ISSUED THIS 8th DAY OF JUNE, 2021.

Scooter Radcliffe
General Manager
Southern Trinity Groundwater Conservation District

Waco Tribune-Herald

Waco, McLennan County,
Texas
Affidavit of Publication

Account Number
1025944

SOUTHERN TRINITY GROUNDWATER
Attn GENERAL MANAGER
P O BOX 2205
WACO, TX 76703

Date	Category	Description	Ad Size	Total Cost
06/16/2021	Legal Notices	NOTICE OF PUBLIC HEARING ON PROPOSED RULES	2 x 95.00 CL	742.05

Publisher of the
Waco Tribune-Herald

Before me, a notary public, on this day personally appeared Ana Lozano-Harper and after being duly sworn, states that she is a Multi Media Sales Manager of the Waco Tribune Herald, a newspaper published in Waco, McLennan County, Texas, and that the Notice, a copy of which is hereto attached, was published in said newspaper on the following named dates, to-wit:

06/10/2021

The First insertion being given ... 06/10/2021

Newspaper reference: 0000707729

Sworn to and subscribed before me this day: 6/11/21

Grace Allen
Notary Public

Ana Lozano-Harper
Multi Media Sales Manager

GRACE ALLEN
MY COMMISSION EXPIRES
MARCH 14, 2023
NOTARY ID: 128549506

State of Texas
Waco,McLennan County
My Commission expires

THIS IS NOT A BILL. PLEASE PAY FROM INVOICE. THANK YOU

studying various options to redesign the regional public transportation fixed route system. The current system is a slightly modified hub and spoke system implemented during the 1950s and has not been changed significantly since 2003. Specifications may be obtained on the City's Website, at www.waco-texas.com/bids.asp. Proposal Qualifications will be opened publicly at 2:01 P.M.

A Pre-Submittal, Non-Mandatory Meeting is scheduled for Thursday, June 03, 2021 at 10:00 A.M. Via Zoom Video and Telecom Dial In. For questions, please contact Paul Campos, at (pcampos@wacotx.gov) or 254-750-8062.

MERCHANDISE

Furniture, Household Items

SUPER BUYS: large office credenza $25, octanol slate cabinet $10, mahogany bar stool $15, bamboo hamper basket $8, non-touch 20 inch Dell PC monitor $5, storage/printer cabinet $10, large office desk $35 & small book shelf $10, 2 door slate stowage/buffet cabinet w/fold-over top $35, queen fabric sleeper couch $35, Kenmore clothes washer and dryer $40 each, cooking pots/pans/dishes bundle $10, hanging clothes bag $10, & 4-door truck long bed fabric stowage cover $35. Will sell all above items as a package for $230/254-218-0195. Photos available on request

Miscellaneous For Sale

FOR SALE Lawn equipment, Mechanics Tools & Welding, Some Lawn Furniture. Make offers. Call 254-301-7124

Tickets

FAITH WALK CHURCH
Will be selling
Hawaiian Falls tickets
for Only $17.00.
If you are interested in purchasing tickets, please text Debby Veracruz at 254-498-5008

Wanted to Buy

We pay cash for your used golf balls. Batches of 300 or more. Roger 512-470-7252 golfballhouse@gmail.com

it's the best time in years to buy a car

NOTICE OF PUBLIC HEARING ON PROPOSED GROUNDWATER MANAGEMENT PLAN

The Southern Trinity Groundwater Conservation District (District) will conduct a public hearing concerning the District's proposed readoption of its groundwater management plan. The purpose of the notice and hearing is to provide interested members of the public the opportunity to provide oral or written comments to the District related to the proposed plan.

1.0 Date, Time, and Place of Public Hearing.
Date: Thursday, July 15, 2021
Time: 12:00 p.m.
Location: District Office
824 Washington Avenue
Waco, Texas

2.0 Brief Explanation of the Proposed Management Plan
The District is proposing to readopt its management plan, which is intended to implement the District's organic act and mandates of Chapter 36 of the Texas Water Code. Among other things, the proposed management plan will address the following management goals for the Trinity Aquifer and the Brazos Alluvium Aquifer within McLennan County:
(1) providing the most efficient use of groundwater;
(2) controlling and preventing waste of groundwater;
(3) controlling and preventing subsidence;
(4) addressing conjunctive surface water management issues;
(5) addressing natural resource issues;
(6) addressing drought conditions;
(7) addressing conservation, recharge enhancement, rainwater harvesting, precipitation enhancement, or brush control, where appropriate and cost-effective; and
(8) for the Trinity Aquifer only, addressing the desired future conditions adopted by the District.
All interested persons are encouraged to review the proposed plan for themselves by obtaining a copy from the District, as provided below.

3.0 Procedures for Obtaining the Proposed Management Plan
Copies of the proposed management plan may be obtained from the District as follows:
1. by calling (254) 759-5610, and requesting a copy of the proposed management plan from the District's General Manager; or
2. by visiting the offices of the District at 824 Washington Avenue, Waco, Texas between 8 a.m. and 12 p.m.; or
3. by requesting the proposed management plan by electronic mail sent to stgcd@stgcd.org; or
4. from the District's website: http://southerntrinitygcd.org.

4.0 Procedures for Submitting Comments on the Proposed Management Plan

4.1 Oral Comments
Any person who desires to provide oral comments must submit a registration form provided by the District at the public hearing, indicating who the person represents, if not providing oral comments on his or her own behalf. The presiding officer may establish the order of oral comments and may limit the number of times a person may speak, the time period for oral comments and for raising questions. The presiding officer may also limit or exclude cumulative, irrelevant, or unduly repetitious oral comments.

4.2 Written Comments
The District encourages all interested parties to submit written comments regarding the proposed management plan. Written comments on the proposed management plan must be filed with the District by no later than July 12, 2021 at 12 p.m. Written comments may be filed as follows:
1. by hand delivery to the District's general manager at the District's offices, 460 N. 6th Street, Waco, Texas during regular business hours Monday through Friday from 8 am to 12 pm; or
2. by mail to the District at P. O. Box 2205, Waco, Texas 76703; or
3. by electronic mail to stgcd@att.net.
Written comments should be filed on 8 1/2 x 11 inch paper and typed or legibly written.

5.0 Opportunity to Appear and Comment at Board Meeting at Which the Proposed Management Plan May be Adopted as Final
The meeting of the District's Board of Directors at which the proposed management plan will be considered for adoption as final will be immediately following the public hearing and will be an open meeting and, at that meeting, the public will be allowed to make comments on the proposed management plan, subject to whatever reasonable limits as to the number, frequency and length of comments the District is empowered to impose pursuant to the Texas Open Meetings Act, TEX. GOV'T CODE ANN. ch. 551.

ISSUED THIS 8th DAY OF JUNE, 2021.
Scooter Radcliffe
General Manager
Southern Trinity Groundwater Conservation District