TEXAS WATER DEVELOPMENT BOARD

P.O. Box 13231, 1700 N. Congress Ave.
Austin, TX 78711-3231, www.twdb.texas.gov
Phone (512) 463-7847, Fax (512) 475-2053

October 6, 2025

Tasha Bates
General Manager
Saratoga Underground Water Conservation District
P.O. Box 168
Lampasas, TX 76550

Dear Ms Bates:

This letter is to notify you that the Saratoga Underground Water Conservation District management plan is administratively complete, as required by Texas Water Code § 36.1072, and contains the information required by Texas Water Code § 36.1071(a) and (e). The policies, plans, and opinions in the groundwater management plan represent those of the District and not those of the Texas Water Development Board.

We received the groundwater management plan for the administrative completeness review on September 15, 2025, and it was approved on October 6, 2025. Included with this letter is your District Groundwater Management Plan Certificate of Administrative Completeness.

Thank you for participating in this effort and contributing to the future of groundwater conservation and management in the state of Texas. Your next five-year management plan is due on October 6, 2030. Starting September 1, 2025, there are new requirements under Texas Water Code § 36.1071 that will apply to your next management plan or any amended plan. We will work with you during your next pre-review to ensure that these new requirements are addressed.

If you have any questions or concerns, please contact Stephen Allen of our Groundwater Technical Assistance Department at 512-463-7317 or stephen.allen@twdb.texas.gov

Sincerely,

Bryan McMath
Executive Administrator

Enclosure

c w/o enc.: Stephen Allen, P.G., Groundwater
Robert Bradley, P.G., Groundwater
James-Eric Simon, Texas Commission on Environmental Quality
Peggy Hunka, P.G., Texas Commission on Environmental Quality

Our Mission

Leading the state's efforts in ensuring a secure water future for Texas

Board Members

L'Oreal Stepney, P.E., Chairwoman | Tonya R. Miller, Board Member

Bryan McMath, Executive Administrator

Saratoga Underground Water Conservation District
Groundwater Management Plan – 2025

I. Introduction

This plan becomes effective upon approval by the Texas Water Development Board (TWDB) and will remain in effect for a period of five years. The plan may be revised at any time, or after five years when the plan will be reviewed to ensure that it is consistent with the applicable Regional Water Plans and the State Water Plan.

District Mission

The Saratoga Underground Water Conservation District (District) Management Plan strives to protect and maintain the quantity and quality of useable groundwater in Lampasas County.

Statement of Guiding Principles

The Saratoga Underground Water Conservation District is created and organized under the terms and provisions of Article XVI, Section 59, of the Constitution of Texas and Chapter 36 (formerly Chapters 50 & 52) of the Texas Water Code, Vernon's Texas Civil Statutes, and the District's actions are authorized by, and consistent with this constitutional and statutory provision, including all amendments and additions. The Act under which the Saratoga Underground Water Conservation District is created prevails over any provision of general law that is in conflict or inconsistent with this Act. The District was created for the purpose to protect and maintain the quantity of useable quality water by conserving, preserving, recharging, and protecting and preventing waste and as far as practicable to minimize the drawdown of the water table and the reduction of artesian pressure of the Trinity and other aquifers within the District boundaries. In order to carry out its constitutional and statutory purposes, the District has all the powers authorized by Article XVI, Section 59, of the Texas Constitution, and Chapter 36 of the Texas Water Code, Vernon's Texas Civil Statutes, together with all amendments and additions.

The District's purposes and powers are implemented through promulgation and enforcement of the District's regulations. These regulations are adopted and revised under the authority of Subchapter E, Chapter 36, Texas Water Code, and are incorporated herein as a part of the District's management plan.

The District is governed by a board of five directors composed of a member from each of the county's precincts and an at-large member from Lampasas County, Texas. The chairman of the board of directors is elected by the board after each general election.

History

The need for a local underground water conservation district to properly manage water from the Trinity and other aquifers in Central Texas was first identified in the late 1980's. At the request of many concerned area citizens, our local State Representative and State Senator were contacted by our County Judge, with the approval of the Lampasas County Commissioners' Court, with an approach to create and enact an Act to form a water district. During Regular Session of the 71st Legislature, H.B. No. 3122 passed unanimously both in the House and the Senate in May,1989. Be it enacted by the Legislature of the State of Texas on June 14, 1989 with a confirmation election to be held and approved by the registered voters of Lampasas County, Texas. Such election was held in November 1989 and approved by a majority of the voters thereby officially establishing the Saratoga Underground Water Conservation District effective January 1, 1990.

The leadership of the District transferred from the Commissioners Court and the County Judge to an appointed Board of Directors in September 2005 with the passage of HB 3539 enacted on September 1, 2005. The new board members continue to represent the four precincts of Lampasas County with an at-large member making up the fifth board membership. The General election of 2006 confirmed three of the new directors with four-year terms of office. The remaining two members were elected during the 2008 general election thereby composing the Board of all elected officials.

Location and Extent

The Saratoga Underground Water Conservation District is located in Central Texas. The District comprises an area of 714 square miles or 456,960 acres, all located within the boundary of Lampasas County, Texas. Principal municipalities and communities in our District include Lampasas, Lometa, Kempner, Adamsville, Izoro, Moline, and a part of Copperas Cove, with the city of Lampasas being the County Seat. County population in 2020 was 21,627 according to the US Census Bureau.

Topography

The District is within the Brazos River Basin and the Colorado River Basin.The County/District line between San Saba and Lampasas Counties is the Colorado River. The Lampasas River, as well as numerous creeks dissects the District. Sulphur Creek is the major creek in the District and its main source of water is from springs. The District's altitude ranges from 800 to 1700 feet, and drainage is typically from west to east.

II. Groundwater Resources

The Saratoga Underground Water Conservation District lies in several aquifers, with the Trinity Aquifer being the primary source of groundwater of interest in our area. Water from this aquifer is used for irrigation, public water supply, industrial, livestock, and domestic needs of the people and entities served. The Trinity Aquifer is comprised of several subunits, or layers, in Lampasas County including the Glen Rose, Travis Peak, Hensell, and Hosston formations.

Other minor aquifers include, but are not limited to, the Ellenburger-San Saba, Marble Falls, and Hickory formations within the District boundaries that meet the limited needs of individuals.

Detailed information regarding the underlying geology and aquifers located within the District boundaries can be found in TWDB Report 380 - " Aquifers of Texas" published by the TWDB and available for download at the following website:

https://www.twdb.texas.gov/publications/reports/numbered_reports/index.asp

III. Technical District Information Required By Texas Administrative Code

The following information has been provided by the TWDB and included as an Appendix which supports specific management plan requirements outlined in Title 31, Texas Administrative Code, Chapter 356 and the Texas Water Code Chapter 36.

1. Groundwater Availability Model Run 19-005 in support of the Saratoga Underground Water Conservation District Groundwater Management Plan – **Appendix A**
2. Estimate of Modeled Available Groundwater in the District based on GAM Run 21-013 MAG for the November 2021 Desired Future Conditions adopted by Groundwater Management Area 8 - **Appendix B**
3. Estimated Historical Water Use and 2022 State Water Plan Datasets - **Appendix C**

A review of the 2022 State Water Plan Dataset (**Appendix C**) indicates that future water supply needs exist in Lampasas County for municipal, irrigation, manufacturing, and mining water user groups. More specifically these user groups are as follows: Copperas Cove, Corix Utilities Texas, Inc, Irrigation-Lampasas, Kempner WSC, Lampasas, Manufacturing and Mining-Lampasas. Those deficits are projected to reach -2,347 by 2070, as shown on page 6.

Future municipal drinking water supply needs in Lampasas County will most likely be met by aquifer development and water conservation for demand reduction. As referenced by the Water Plan Dataset (Appendix C) specific water management strategies pages 7-8 show 2,787 acre feet by 2070 are anticipated to reach the projected demand. More specifically, for the Copperas Cove user group purchasing raw water from Ft Hood and Lake Granger augmentation are strategies. Regarding the Corix Utilities Texas Inc user group developing the Gulf Coast Aquifer will combat the deficits. In the Irrigation user group, developing the Marble Falls Aquifer and reducing demand will manage that deficit. In the Kempner WSC user group, the strategy is for municipal water conservation. Regarding the Lampasas, Brazos there is a strategy for Lake Granger augmentation. With Manufacturing in Lampasas, meeting the deficit requires conservation or purchasing water from the City of Lampasas. In the Mining user group, the Ellenburger-San Saba Aquifer will be developed.

IV. Management Goals, Objectives, and Performance Standards

Goal 1.0:Providing the Most Efficient Use of Groundwater

Management Objective 1.1
Each year, the District will collect and complete a review of the monitoring well water level data obtained from the TWDB monitoringwells located within the District boundary, in order to improveunderstanding of available and developed groundwater supplies in Lampasas County.

Performance Standard 1.1
Based on review of the monitoringwell data obtained from TWDB, the District will coordinate with TWDB officials to assess the performance and necessity for modifications to the ongoing monitoring program on an annual basis. Recommendations or modifications, if any, will be noted in the District's annual activity report.

Management Objective 1.2
Each year, the District will regulate and account for groundwater withdrawal in Lampasas County.

Performance Standard 1.2
The District has rules in place which require reporting to Lampasas County of all new wells drilled to include production volume, water use,and location. The District Board of Directors will collect and complete a review of all new submitted well drillers' reports at each regularly scheduled Board meeting.To date, the District is not aware of any new wells drilled which exceed the production volume required for a non-exemption status in the District (greater than 25,000 gallons per day). The District will coordinate with Lampasas County officials and local well drillers to complete an assessment of the performance and necessity for modifications to the ongoing reporting program on an annual basis.Recommendations or modifications, ifany, will be noted in the District's annual activity report.

Goal 2.0:Controlling and Preventing Waste of Groundwater

Management Objective 2.1
Each year, the District will encourage the sustainable use of groundwater for beneficial purposes within Lampasas County.

Performance Standard 2.1
The District has adopted rules and procedures to address transportation of groundwater outside the District boundaries, well construction standards and minimum spacing requirements, and the identification of critical groundwater depletion areas, The District Board of Directors will complete an assessment of the necessity for modifications or enhancements to the adopted rules at a regularly scheduled Board meeting on an annual basis. Recommendations or modifications, if any, will be noted in the District's annual activity report.

Goal 3.0: Addressing Conjunctive Surface Water Management Issues

Management Objective 3.1
Each year, the District will complete an assessment of the availability of surface water resources which may be used as an alternate to groundwater.

Performance Standard 3.1
The District will keep up to date and informed regarding the availability of additional surface water or groundwater resources within the District through ongoing and regular communication with TWDB representatives, local City and County officials, and regular attendance and participation in the Groundwater Management Area 8 planning meetings. The District Board of Directors will collect and complete a review ofall new submitted well drillers' reports at each regularly scheduled Board meeting. In the event that a new permit application is filed to drill a well or group of wells which will significantly increase the annual groundwater volume pumped from within the District boundary, an assessment of alternate surface water supplies available to the applicant will be an inherent part of the District's review process. Findings and outcomes will be noted in the District's annual activity report.

Goal 4.0: Addressing Natural Resource Issues

Management Objective 4.1
Each year, the District will complete an assessment of all new oil and gas or commercial related groundwater well drillers' reports for potential contamination and/or pollution of the aquifers from other natural resources being produced within the District.

Performance Standard 4.1:
The District has the ability to monitor new oil and gas or commercial related groundwater well drilling operations via the ongoing well reporting requirements for potential contamination issues or concerns. The District Board of Directors will collect and complete a review of all new submitted well drillers' reports at each regularly scheduled Board meeting. In the event that a potential contamination issue is identified, the District Board

of Directors will make an assessment of the legal and regulatory options to minimize the concern for pollution of existing groundwater resources. An overview of the assessment and findings will be included the District's annual activity report.

Goal 5.0: Addressing Drought Conditions

Management Objective 5.1
The District will monitor drought conditions quarterly throughout the year. Useful drought information can be found on the following website: https://www.waterdatafortexas.org/drought.

Performance Standard 5.1
At each regularly scheduled Board meeting during drought conditions, the District Board of Directors will complete a review of available drought severity indices and implement well monitoring and/or management strategies as deemed necessary and appropriate for the existing groundwater users within the District. Well monitoring and/or management strategies implemented will be included in the District's annual activity report.

Goal 6.0: Addressing Conservation, Brush Control, and Rainwater Harvesting

Management Objective 6.1

Each year, the District will provide public educational material to encourage conservation and more efficient use of groundwater to include brush control, and implementation of rainwater harvesting strategies.

Performance Standard 6.1
The District will distribute readily available educational material using the existing County website in order to facilitate the above-mentioned objectives. The District Board of Directors will conduct a review the posted educational material at a regularly scheduled Board meeting and provide updated material as available on an annual basis. A copy of the public educational material provided and posted on the County website will be included in the District's annual activity report.

Goal 7.0: Addressing the Desired Future Conditions of the District

Management Objective 7.1
The District will annually, in coordination with the ongoing TWDB well monitoring program, compare annual water level measurements with previous years to determine trends, specific declines or increases in the monitor wells of the Trinity Aquifer. Water level comparisons will be used to determine if the desired future conditions (DFC's) are being achieved or if a serious decline in Trinity Aquifer

water levels warrant further study or action by the District Board of Directors. If deemed necessary based on the annual review of the monitoring well data, the District will take appropriate action such as conduct public hearings to make citizens of the SUWCD aware of severe changes in groundwater levels and/or implement additional conservation strategies.

Performance Standard 7.1

The number of monitor wells measured as well as the number of comparison analysis reports submitted to the District Board of Directors annually, will be included in the District's annual activity report. If applicable, the number of public hearings conducted and/or conservation strategies implemented when severe water level changes occurred will be included in the District's annual activity report.

The District has determined that the following management goals are not applicable because they are either not cost effective or appropriate:

TWC Chapter 36.1071(a)(3): Controlling and Preventing Subsidence. The District has reviewed the following TWDB publication: "Identification of the Vulnerability of the Major and Minor Aquifers of Texas to Subsidence withRegard to Groundwater Pumping – TWDB Contract Number 1648302062 - found here: https://www.twdb.texas.gov/groundwater/models/research/subsidence/subsidence.asp. The TWDB publication, on page 128, indicates that the aquifers located in Lampasas County are identified as low to medium risk for subsidence. If indicators change over time,the District will monitor for subsidence.

TWC Chapter 36.1071(a)(7): Recharge Enhancement, Precipitation Enhancement and Brush Control. The District has determined that recharge enhancement, precipitation enhancement and brush control are not cost effective or appropriate for the management of groundwater resources in Lampasas County.

Methodology for Tracking Progress

The Chairman of the Board of Directors will give an activity report to the District Board of Directors at the annual meeting in November to ensure management objectives and goals are being followed and achieved by the District. The Board will also elect its officers at that meeting. The Board will maintain the annual activity report on file for public inspection at the Lampasas County office upon adoption.

Management of Groundwater Supplies

The District will manage the supply of groundwater within the District in order to conserve the resource while maintaining the viability of all resource user groups, public and private. As deemed necessary, the District will identify and engage in activities and practices that, if implemented, would result in reduction of groundwater use. The District may require reduction of groundwater withdrawals to amounts that will not cause harm to the aquifers. The District may, at the Board's discretion, amend or revoke any permits after notice and hearing to achieve this purpose. The District will consider the public benefit against individual hardship in determining permit denial or limiting groundwater withdrawals after considering all appropriate testimony. The District shall treat all citizens with equality. A public or private user may appeal to the Board for discretion in enforcement of the provisions of the District's rules and regulations on grounds of adverse economic hardship or unique local conditions. The exercise of said discretion by the Board shall not be construed as limiting the power of the Board.

Actions, Procedures, Performance, and Avoidance for Plan Implementation

The District will implement and use the provisions of this plan as a guidepost for determining the direction or priority for all District activities. All operations of the District, all agreements entered into by the District, and any additional planning efforts that the District may participate in will be consistent with the provisions of this plan. The District will seek cooperation in the implementation of this plan and the management of groundwater supplies within the District. All activities of the Saratoga Underground Water Conservation District will be undertaken in cooperation and coordination with the appropriate state, regional or local water entity.

The District has adopted rules relating to the permitting of wells and production of groundwater. All rules will be adhered to and enforced. The promulgation and enforcement of the rules will be based on the best technical advice available.

The District rules may be viewed on the District website: https://www.saratogauwcd.org

Appendix A

Groundwater Availability Model Run 19-005

GAM Run 19-005: Saratoga Underground Water Conservation District Groundwater Management Plan

Jerry Shi, Ph.D., P.G.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Department
512-463-5076
March 15, 2019

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GAM Run 19-005: Saratoga Underground Water Conservation District Groundwater Management Plan

Jerry Shi, Ph.D., P.G.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Department
512-463-5076
March 15, 2019

EXECUTIVE SUMMARY:

Texas Water Code, Section 36.1071(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 Saratoga Underground Water 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 Saratoga Underground Water Conservation District should be adopted by the district on or before July 18, 2019 and submitted to the Executive Administrator of the TWDB on or before August 18, 2019. The current management plan for the Saratoga Underground Water Conservation District expires on October 16, 2019.

This report replaces the results of GAM Run 13-019 (Seiter-Weatherford, 2013). GAM Run 19-005 includes results from the updated groundwater availability model for the northern portion of the Trinity and Woodbine aquifers (Kelley and others, 2014) and the new groundwater availability model for the Llano Uplift minor aquifers (Shi and others, 2016). Tables 1, 2, 3, and 4 summarize the groundwater availability model data for the Trinity Aquifer, the Marble Falls Aquifer, the Ellenburger-San Saba Aquifer, and the Hickory Aquifer required by statute. Figures 1, 2, 3, and 4 show the area of the models from which the values in the tables were extracted. If, after review of the figures, the Saratoga Underground Water Conservation District determines that the district boundaries used in the assessment do not reflect current conditions, please notify the TWDB at your earliest convenience.

METHODS:

In accordance with the provisions of the Texas Water Code, Section 36.1071(h), the groundwater availability model for the northern portion of the Trinity and Woodbine aquifers and the groundwater availability model for the Llano Uplift minor aquifers were used to estimate information for the Saratoga Underground Water Conservation District management plan. Water budgets from the groundwater availability model for the northern portion of the Trinity and Woodbine aquifers were extracted for the historical period (1980 through 2012) using Zonebudget Version 3.01 (Harbaugh, 2009). The water budgets from the groundwater availability model for the Llano Uplift minor aquifers were extracted for the historical period (1981 through 2010) using ZONBUDUSG version 1.01 (Panday and others, 2013). 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 Aquifer

- We used version 2.01 of the groundwater availability model for the northern portion of the Trinity and Woodbine aquifers for this analysis. See Kelley and others (2014) for assumptions and limitations of the model.

- The model has eight layers which, in the area under the Saratoga Underground Water District, represent the Trinity Aquifer and younger units (Layers 1 through 3) and the Trinity Aquifer (Layers 4 through 8).
- Water budgets for the district were determined using the official aquifer boundaries from the associated model layers as described above.
- The model was run with MODFLOW-NWT (Niswonger and others, 2011).
- The groundwater discharge to surface water was calculated from the MODFLOW-NWT river and drain boundaries.

Marble Falls Aquifer, Ellenburger-San Saba Aquifer, and Hickory Aquifer

- We used version 1.01 of the groundwater availability model for the Llano Uplift minor aquifers for this analysis. See Shi and others (2016) for assumptions and limitations of the model.
- The model has eight layers which, in the area under the Saratoga Underground Water District, represent the Trinity Aquifer and younger units (Layer 1), confining units between the Trinity and Marble Falls (Layer 2), the Marble Falls Aquifer (Layer 3), confining units between Marble Falls and Ellenburger-San Saba (Layer 4), the Ellenburger-San Saba Aquifer (Layer 5), confining units between Ellenburger-San Saba and Hickory (Layer 6), the Hickory Aquifer (Layer 7), and the Precambrian (Layer 8).
- Water budgets for the district were determined using the official aquifer boundaries from the associated model layers as described above.
- The model was run with MODFLOW-USG Beta (Panday and others, 2013).
- The groundwater discharge to surface water was calculated from the MODFLOW-NWT river and drain boundaries.

RESULTS:

A groundwater budget summarizes the amount of water entering and leaving the aquifers according to the groundwater availability model. The groundwater budget components listed below and reported in Tables 1, 2, 3, and 4 were extracted from the groundwater availability model results for the northern portion of the Trinity and Woodbine aquifers and for the Llano Uplift minor aquifers within Saratoga Underground Water Conservation District and averaged over the historical calibration periods.

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.

Water budgets are estimates because of 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 SARATOGA UNDERGROUND WATER 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	14,634
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Trinity Aquifer	32,519
Estimated annual volume of flow into the district within each aquifer in the district	Trinity Aquifer	7,764
Estimated annual volume of flow out of the district within each aquifer in the district	Trinity Aquifer	4,626
Estimated net annual volume of flow between each aquifer in the district	From younger units to Trinity Aquifer	4,662

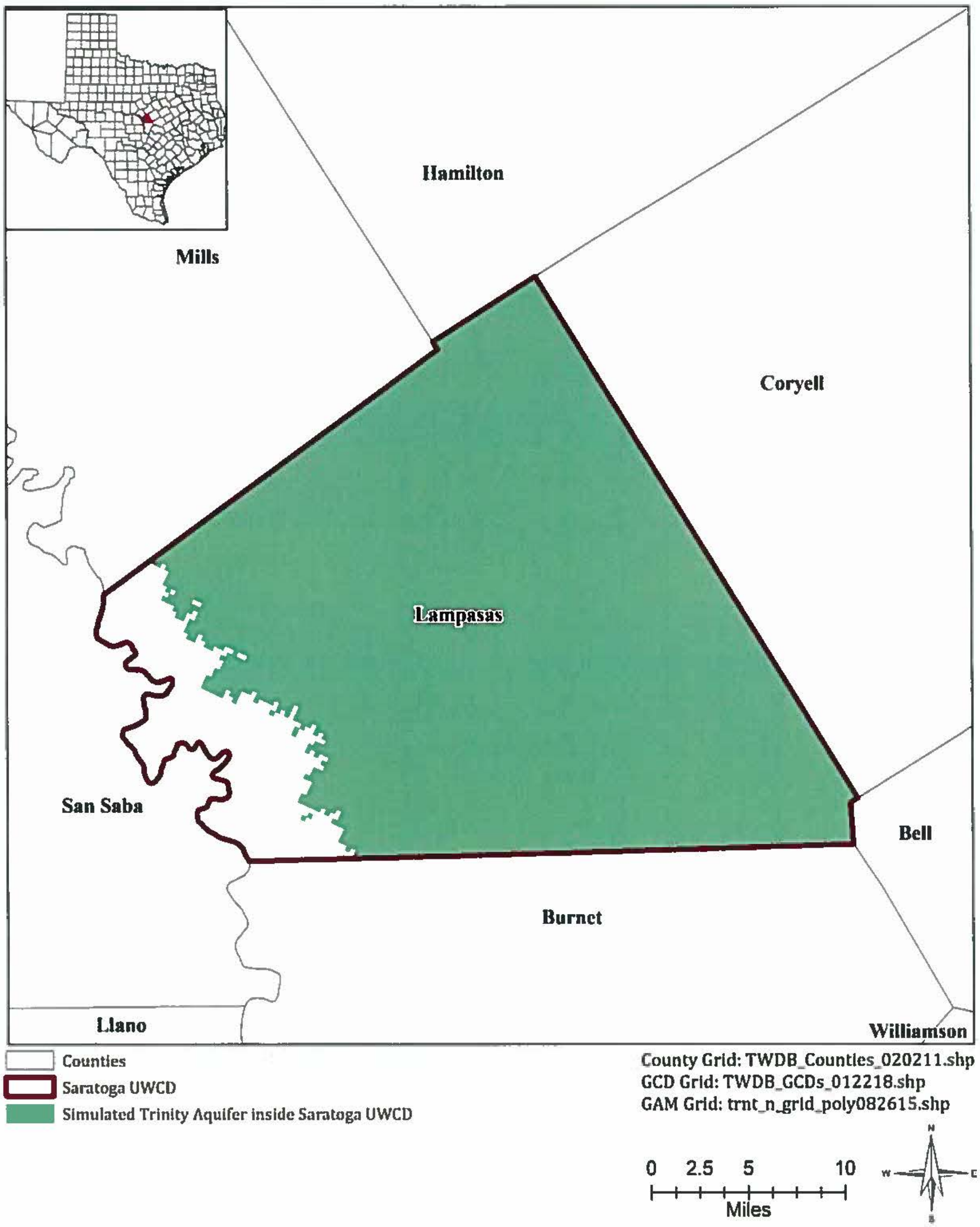

FIGURE 1. AREA OF THE GROUNDWATER AVAILABILITY MODEL FOR THE TRINITY AQUIFER FROM WHICH THE INFORMATION IN TABLE 1 WAS EXTRACTED (THE TRINITY AQUIFER EXTENT WITHIN THE DISTRICT BOUNDARY).

TABLE 2. SUMMARIZED INFORMATION FOR THE MARBLE FALLS AQUIFER FOR SARATOGA UNDERGROUND WATER 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	Marble Falls Aquifer	1,649
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Marble Falls Aquifer	6,769
Estimated annual volume of flow into the district within each aquifer in the district	Marble Falls Aquifer	1,799
Estimated annual volume of flow out of the district within each aquifer in the district	Marble Falls Aquifer	3,108
Estimated net annual volume of flow between each aquifer in the district	From Marble Falls Aquifer to Marble Falls units	1,084
	From Marble Falls Aquifer to units between Trinity and Marble Falls	395
	From Marble Falls Aquifer to Trinity Aquifer	35
	From units between Marble Falls and Ellenburger-San Saba to Marble Falls Aquifer	2,030
	From Marble Falls Aquifer to Ellenburger-San Saba Aquifer	87

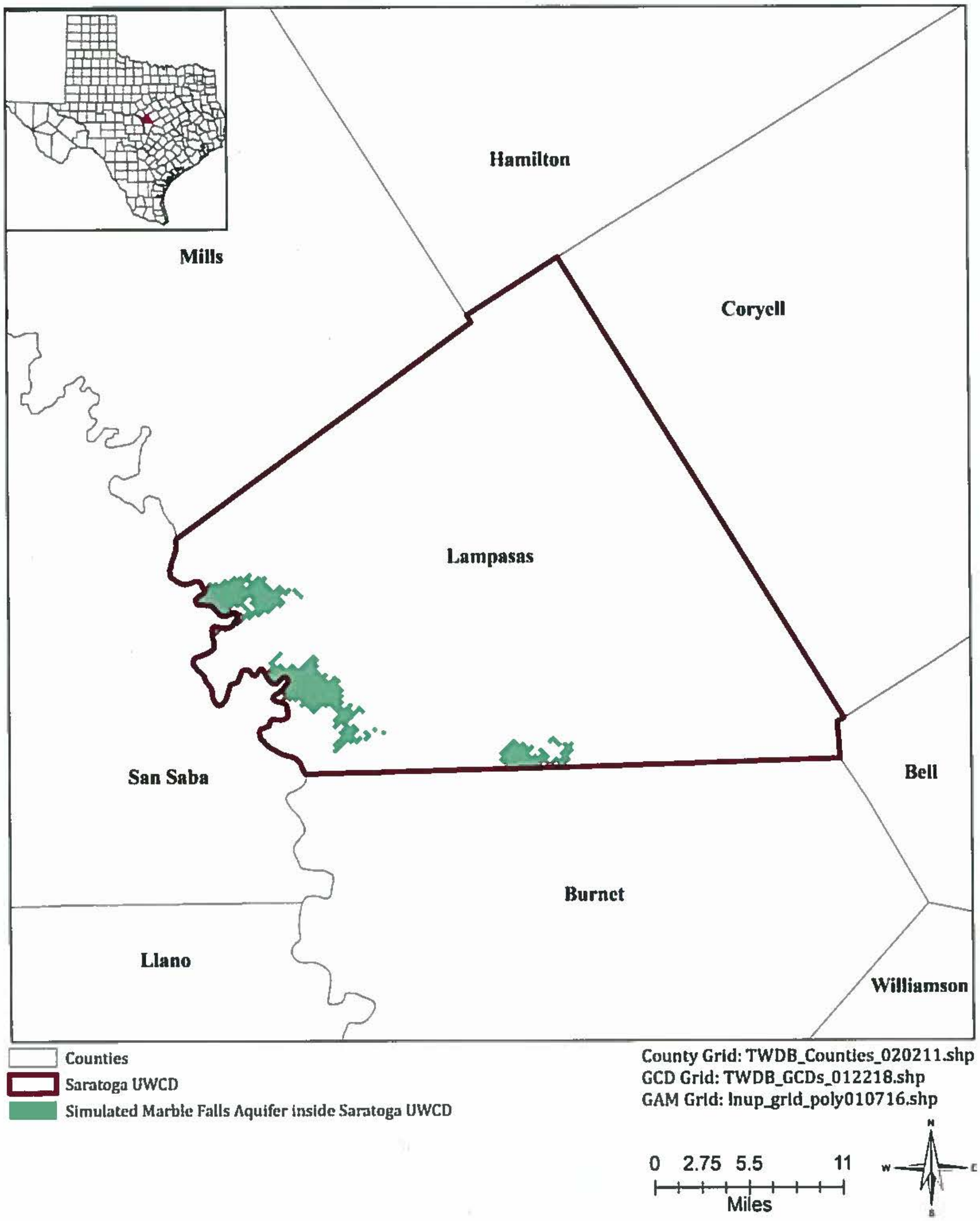

FIGURE 2. AREA OF THE GROUNDWATER AVAILABILITY MODEL FOR THE MARBLE FALLS AQUIFER FROM WHICH THE INFORMATION IN TABLE 2 WAS EXTRACTED (THE MARBLE FALLS AQUIFER EXTENT WITHIN THE DISTRICT BOUNDARY).

TABLE 3. SUMMARIZED INFORMATION FOR THE ELLENBURGER-SAN SABA AQUIFER FOR SARATOGA UNDERGROUND WATER 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	Ellenburger-San Saba Aquifer	4,689
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Ellenburger-San Saba Aquifer	29,918
Estimated annual volume of flow into the district within each aquifer in the district	Ellenburger-San Saba Aquifer	13,291
Estimated annual volume of flow out of the district within each aquifer in the district	Ellenburger-San Saba Aquifer	9,572
Estimated net annual volume of flow between each aquifer in the district	From Ellenburger-San Saba Aquifer to brackish portion	382
	From Trinity Aquifer to Ellenburger-San Saba Aquifer	1
	From Marble Falls Aquifer to Ellenburger-San Saba Aquifer	66
	From Ellenburger-San Saba Aquifer to units between Trinity and Marble Falls	1
	From Ellenburger-San Saba Aquifer to units between Marble Falls and Ellenburger-San Saba	1,712
	From units between Ellenburger-San Saba and Hickory to Ellenburger-San Saba Aquifer	811
	From Ellenburger-San Saba Aquifer to Hickory Aquifer	19

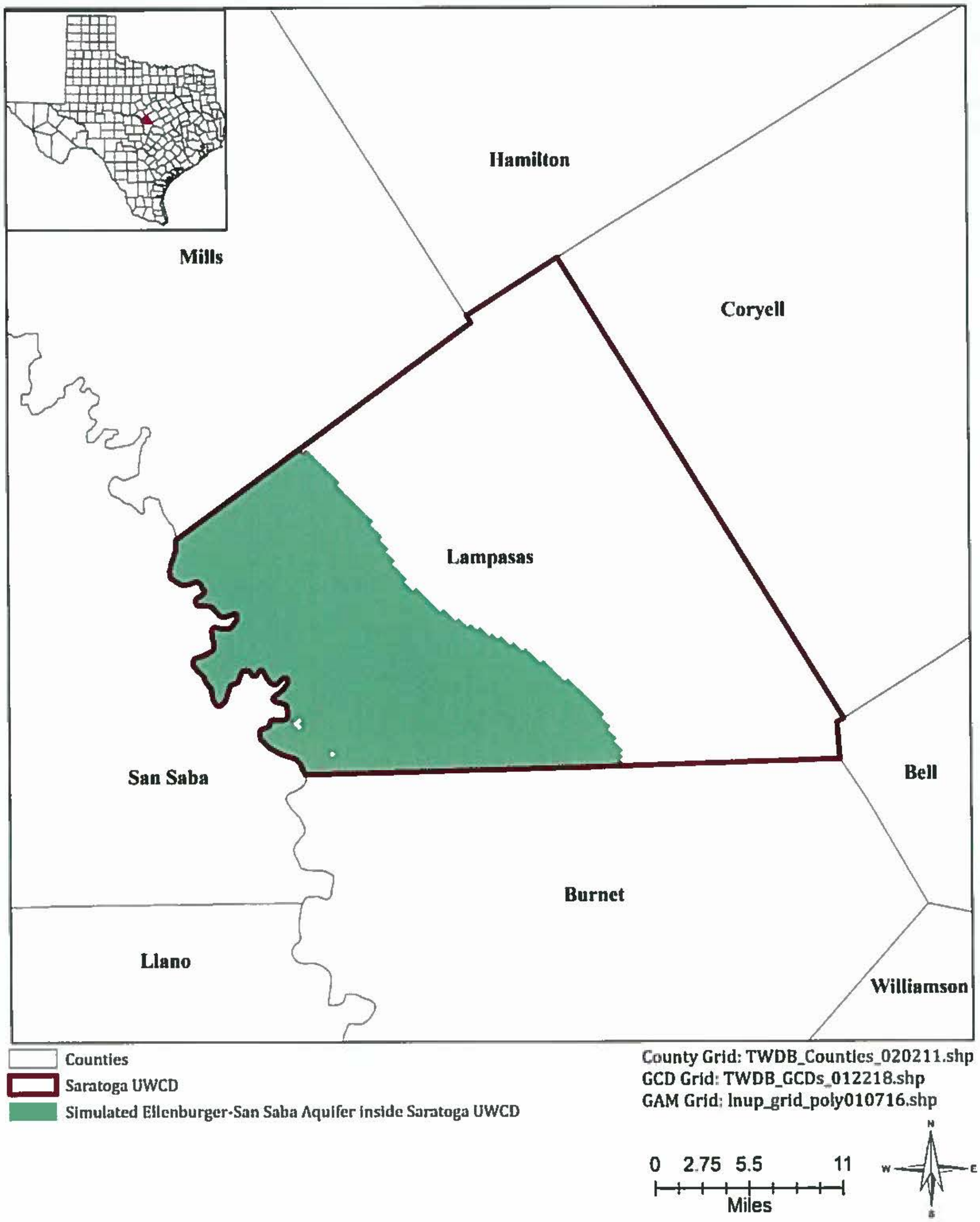

FIGURE 3. AREA OF THE GROUNDWATER AVAILABILITY MODEL FOR THE ELLENBURGER-SAN SABA AQUIFER FROM WHICH THE INFORMATION IN TABLE 3 WAS EXTRACTED (THE ELLENBURGER-SAN SABA AQUIFER EXTENT WITHIN THE DISTRICT BOUNDARY).

TABLE 4. SUMMARIZED INFORMATION FOR THE HICKORY AQUIFER FOR SARATOGA UNDERGROUND WATER 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	Hickory Aquifer	0
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Hickory Aquifer	0
Estimated annual volume of flow into the district within each aquifer in the district	Hickory Aquifer	3,791
Estimated annual volume of flow out of the district within each aquifer in the district	Hickory Aquifer	2,285
Estimated net annual volume of flow between each aquifer in the district	From Hickory Aquifer to brackish portion	705
	From Ellenburger-San Saba Aquifer to Hickory Aquifer	28
	From Hickory Aquifer to units between Ellenburger-San Saba and Hickory	954
	From Precambrian Units to Hickory Aquifer	123

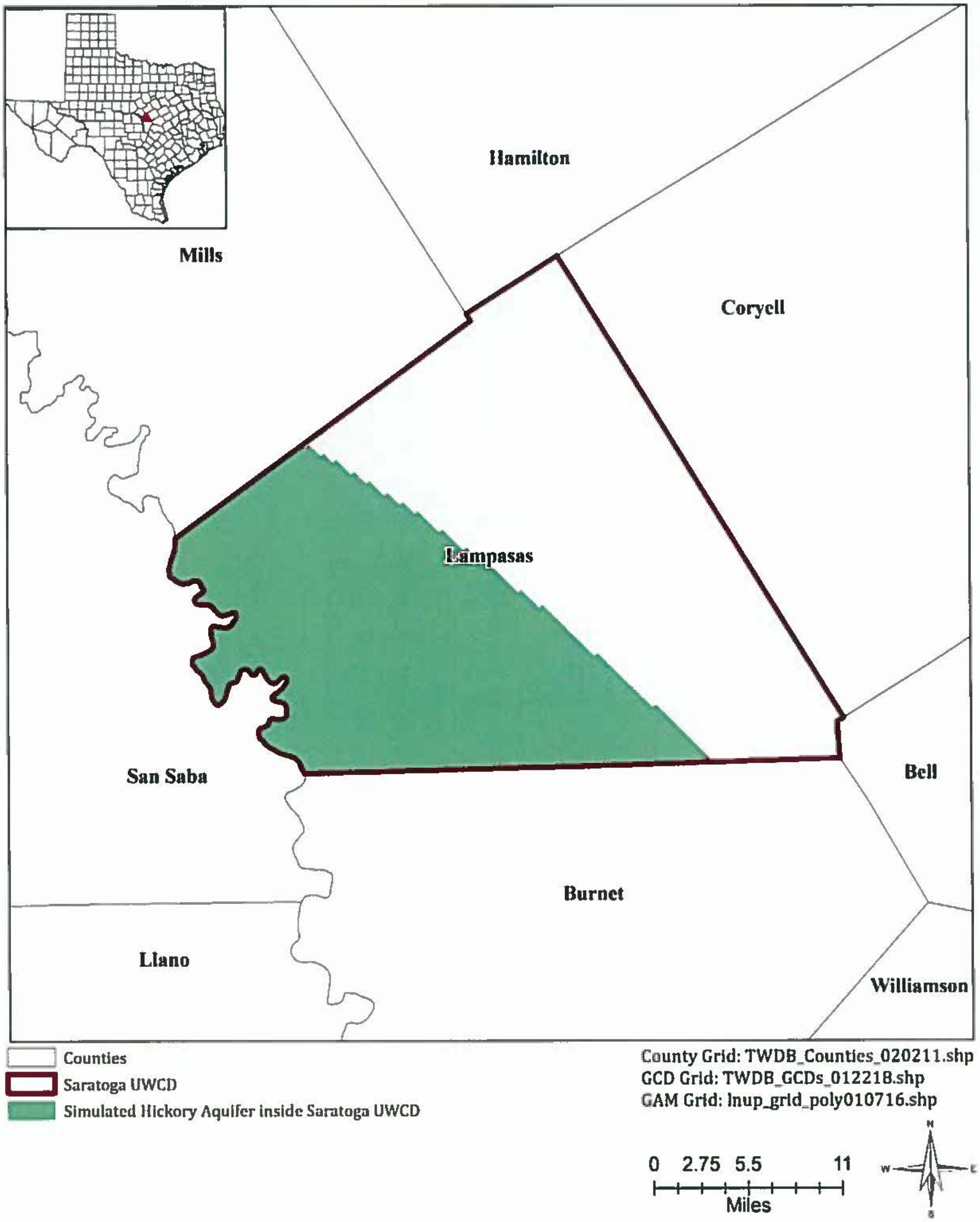

FIGURE 4. AREA OF THE GROUNDWATER AVAILABILITY MODEL FOR THE HICKORY AQUIFER FROM WHICH THE INFORMATION IN TABLE 3 WAS EXTRACTED (THE HICKORY AQUIFER EXTENT WITHIN THE DISTRICT BOUNDARY).

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

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

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

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Appendix B

Estimate of Modeled Available Groundwater in the District based on GAM Run 21-013 MAG for the November 2021 Desired Future Conditions adopted by the Groundwater Management Area 8.

GAM RUN 21-013 MAG: MODELED AVAILABLE GROUNDWATER FOR THE AQUIFERS IN GROUNDWATER MANAGEMENT AREA 8

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Texas Water Development Board
Groundwater Division
Groundwater Modeling Department
512-463-5076
November 1, 2022

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Geoscientist Seals

The following professional geoscientists contributed to this conceptual model report and associated data compilation and analyses:

Jianyou (Jerry) Shi, Ph.D., P.G.

> Dr. Shi was responsible for the calculations to verify the attainability of desired future conditions and the calculations of modeled available groundwater values. He was the primary author of the report.

Signature

11/10/2022

Date

Jevon Harding, P.G.

> Ms. Harding was responsible for editing the report and adding additional documentation as necessary to meet TWDB standards after Dr. Shi had left the agency.

Signature

11/3/2022

Date

GAM RUN 21-013 MAG: MODELED AVAILABLE GROUNDWATER FOR THE AQUIFERS IN GROUNDWATER MANAGEMENT AREA 8

Jerry Shi, Ph.D., P.G. and Jevon Harding, P.G.
Texas Water Development Board
Groundwater Division
Groundwater Modeling Department
512-463-5076
November 1, 2022

EXECUTIVE SUMMARY:

The Texas Water Development Board (TWDB) has prepared estimates of the modeled available groundwater 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 revised desired future conditions for these aquifers adopted by groundwater conservation districts in Groundwater Management Area 8 on July 26, 2022. The district representatives declared the Nacatoch, Blossom, Brazos River Alluvium, and Cross Timbers aquifers to be non-relevant for purposes of joint planning. After review, the TWDB determined that the explanatory report and other materials submitted by the district representatives were administratively complete on September 23, 2022.

The modeled available groundwater values are summarized by decade by groundwater conservation district and county (Tables 1 through 12) and by county, regional water planning area, and river basin for use in the regional water planning process (Tables 13 through 24). The modeled available groundwater in Groundwater Management Area 8 is described below:

- Trinity Aquifer (Paluxy aquifer) – The modeled available groundwater is approximately 24,520 acre-feet per year during the period from 2020 to 2080.
- Trinity Aquifer (Glen Rose Formation) – The modeled available groundwater is approximately 12,410 acre-feet per year during the period from 2020 to 2080.

- Trinity Aquifer (Twin Mountains Formation) – The modeled available groundwater is approximately 45,510 acre-feet per year during the period from 2020 to 2080.
- Trinity Aquifer (Travis Peak Formation) – The modeled available groundwater is approximately 98,230 acre-feet per year during the period from 2020 to 2080.
- Trinity Aquifer (Hensell aquifer) – The modeled available groundwater is approximately 27,120 acre-feet per year during the period from 2020 to 2080.
- Trinity Aquifer (Hosston aquifer) – The modeled available groundwater is approximately 67,730 acre-feet per year during the period from 2020 to 2080.
- Trinity Aquifer (Antlers Formation) – The modeled available groundwater is approximately 78,440 acre-feet per year during the period from 2020 to 2080.
- Woodbine Aquifer – The modeled available groundwater is approximately 30,570 acre-feet per year during the period from 2020 to 2080.
- Edwards (Balcones Fault Zone) Aquifer – The modeled available groundwater is approximately 15,170 acre-feet per year during the period from 2020 to 2080.
- Marble Falls Aquifer – The modeled available groundwater is approximately 5,630 acre-feet per year during the period from 2020 to 2080.
- Ellenburger-San Saba Aquifer – The modeled available groundwater is approximately 14,060 acre-feet per year during the period from 2020 to 2080.
- Hickory Aquifer – The modeled available groundwater is approximately 3,580 acre-feet per year during the period from 2020 to 2080.

Modeled available groundwater estimates are also provided by outcrop and downdip areas for the counties within Upper Trinity Groundwater Conservation District to be consistent with that district's desired future conditions statements.

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.

REQUESTOR:

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

DESCRIPTION OF REQUEST:

In a letter dated January 4, 2022, Mr. Drew Satterwhite provided the TWDB with the desired future conditions of the Trinity Aquifer subunits (Paluxy, Glen Rose, Twin Mountains, Travis Peak, Hensell, Hosston, and Antlers formations), and the Woodbine, Edwards (Balcones Fault Zone), Marble Falls, Ellenburger-San Saba, and Hickory aquifers. After review of the submittal, the TWDB identified missing or corrupted model files and received updated versions from Groundwater Management Area 8 on March 3, 2022. Following the TWDB analysis to verify the achievability of the adopted desired future conditions, the TWDB identified desired future conditions that were unachievable. Groundwater Management Area 8 confirmed that these were typos and adopted a revised version of the desired future conditions resolution on July 26, 2022. The following sections present the final adopted desired future conditions:

Trinity and Woodbine aquifers

The desired future conditions for the Trinity and Woodbine aquifers are expressed as water level decline, or drawdown, in feet from January 1, 2010, to December 31, 2080 (Groundwater Management Area 8, 2021).

The county-based desired future conditions for the Trinity Aquifer subunits, excluding counties in the Upper Trinity Groundwater Conservation District, are listed in Table 1 (dashes indicate areas where the subunits do not exist):

TABLE 1. DESIRED FUTURE CONDITIONS IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY COUNTY FOR THE NORTHERN TRINITY AND WOODBINE AQUIFERS. VALUES REPRESENT AVERAGE DRAWDOWN IN FEET BETWEEN JANUARY 1, 2010, AND DECEMBER 31, 1980.

County	Woodbine	Paluxy	Glen Rose	Twin Mountains	Travis Peak	Hensell	Hosston	Antlers
Bell	—	17	83	—	333	145	375	—
Bosque	—	6	53	—	189	139	232	—
Bowie	—	—	—	—	—	—	—	—
Brown	—	—	1	—	2	1	1	2
Burnet	—	—	2	—	19	7	21	—
Callahan	—	—	—	—	—	—	—	1
Collin	482	729	366	560	—	—	—	596
Comanche	—	—	2	—	4	2	3	12

TABLE 2 (CONT). DESIRED FUTURE CONDITIONS IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY COUNTY FOR THE NORTHERN TRINITY AND WOODBINE AQUIFERS. VALUES REPRESENT AVERAGE DRAWDOWN IN FEET BETWEEN JANUARY 1, 2010, AND DECEMBER 31, 1980.

County	Woodbine	Paluxy	Glen Rose	Twin Mountains	Travis Peak	Hensell	Hosston	Antlers
Cooke	2	—	—	—	—	—	—	191
Coryell	—	5	15	—	107	70	141	—
Dallas	137	346	288	515	415	362	419	—
Delta	—	279	198	—	202	—	—	—
Denton	22	558	367	752	—	—	—	416
Eastland	—	—	—	—	—	—	—	4
Ellis	76	128	220	413	380	290	390	—
Erath	—	6	6	8	25	12	35	14
Falls	—	159	238	—	505	296	511	—
Fannin	259	709	305	400	291	—	—	269
Franklin	—	—	—	—	—	—	—	—
Grayson	163	943	364	445	—	—	—	364
Hamilton	—	2	4	—	26	14	38	—
Hill	20	45	149	—	365	211	413	—
Hopkins	—	—	—	—	—	—	—	—
Hunt	631	610	326	399	350	—	—	—
Johnson	4	-57	66	184	235	120	329	—
Kaufman	242	311	305	427	372	349	345	—
Lamar	42	100	107	—	125	—	—	132
Lampasas	—	—	1	—	6	1	11	—
Limestone	—	199	301	—	433	214	445	—
McLennan	6	41	148	—	504	242	582	—
Milam	—	—	241	—	412	261	412	—
Mills	—	1	1	—	9	2	13	—
Navarro	110	139	266	—	343	295	343	—
Rains	—	—	—	—	—	—	—	—
Red River	2	24	40	—	57	—	—	15
Rockwall	275	433	343	466	—	—	—	—
Somervell	—	4	4	50	64	17	120	—
Tarrant	6	105	163	348	—	—	—	177
Taylor	—	—	—	—	—	—	—	0
Travis	—	—	90	—	219	68	226	—
Williamson	—	—	78	—	220	89	225	—

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 in Table 2 (dashes indicate areas where the subunits do not exist):

TABLE 2. THE DESIRED FUTURE CONDITIONS FOR THE UPPER TRINITY GROUNDWATER CONSERVTION DISTRICT IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY AQUIFER. VALUES REPRESENT AVERAGE DRAWDOWN IN FEET BETWEEN JANUARY 1, 2010, AND DECEMBER 31, 1980.

County	Antlers	Paluxy	Glen Rose	Twin Mountains
Hood -Outcrop	—	6	9	13
Hood-Downdip	—	—	39	72
Montague-Outcrop	40	—	—	—
Montague-Downdip	—	—	—	—
Parker-Outcrop	42	6	20	7
Parker-Downdip	—	2	50	68
Wise-Outcrop	60	—	—	—
Wise-Downdip	154	—	—	—

Edwards (Balcones Fault Zone) Aquifer

The desired future conditions adopted by Groundwater Management Area 8 for the Edwards (Balcones Fault Zone) Aquifer are to maintain minimum streamflow and springflow under a repeat of the drought of record in Bell, Travis, and Williamson counties from January 1, 2010, to December 31, 2080 (Groundwater Management Area 8, 2021). The desired future conditions are listed in Table 3:

TABLE 3. THE DESIRED FUTURE CONDITIONS IN GROUNDWATER MANAGEMENT AREA (GMA) 8 BASED ON SPRING/STREAM FLOW FOR SELECTED COUNTIES. THESE CONDITIONS ARE TO BE MAINTAINED BETWEEN JANUARY 1, 2010, AND DECEMBER 31, 1980.

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 defined as water level decline, or drawdown, in feet from January 1, 2010, to December 31, 2080 (Groundwater Management Area 8, 2021). The desired future conditions are listed in Table 4:

TABLE 4. DESIRED FUTURE CONDITIONS IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY COUNTY FOR THE LLANO UPLIFT AQUIFERS. VALUES REPRESENT AVERAGE DRAWDOWN IN FEET BETWEEN JANUARY 1, 2010, AND DECEMBER 31, 1980.

County	Ellenburger-San Saba	Hickory	Marble Falls
Brown	3	3	3
Burnet	12	11	11
Lampasas	16	16	16
Mills	9	9	9

METHODS:

The desired future conditions for Groundwater Management Area 8 are based on multiple criteria. 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 the predictive simulation "Run 11" (Groundwater Management area 8, 2021), which was constructed as an extension of the groundwater availability model for the northern portion of the Trinity and Woodbine aquifers (Kelley and others, 2014).

The average drawdowns between January 1, 2010 (initial water levels) and December 31, 2080 (stress period 71) were calculated using a composite water levels methodology, described in Appendix A. Appendix A also presents the calculated average drawdown results for the Trinity and Woodbine aquifers that the TWDB used to verify that the pumping scenario in the submitted model files achieved the desired future conditions. The modeled available groundwater values were determined by extracting pumping rates by decade from the MODFLOW cell-by-cell budget files using custom Fortran scripts developed by the TWDB.

Edwards (Balcones Fault Zone) Aquifer

Groundwater Management Area 8 requested that the results from the previous GAM Run 08-010 MAG (Anaya, 2008) be used, unchanged, for the current round of joint planning. That model run includes a ten-year predictive period that represents a simulated repeat of the drought of record in the 1950s. The modeled available groundwater values were determined using the monthly stress period within that predictive period with the lowest monthly springflow volume, which was assumed to represent the worst-case scenario for Salado Springs during a potential repeat of the 1950s 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 within Groundwater Management Area 8 are based on a predictive simulation constructed by Groundwater Management Area 8 for planning purposes (Groundwater Management Area 8, 2021). This simulation is an extension of the groundwater availability model for the minor aquifers in the Llano Uplift region by Shi and others (2016). Modeled water levels were extracted for January 1, 2010 (initial water levels) and December 31, 2080 (stress period 71) and drawdown calculated as the difference in water level between those two endpoints. Drawdown averages were calculated by aquifer for each area specified in the desired future conditions. Additional details on the predictive simulation and methods to calculate the drawdowns are described in Appendix B. Appendix B also presents the calculated average drawdown results for the Marble Falls, Ellenburger-San Saba, and Hickory aquifers that the TWDB used to verify that the pumping scenario in the submitted model files achieved the desired future conditions. The modeled available groundwater values were determined by extracting pumping rates by decade from the MODFLOW cell-by-cell budget files using custom Fortran scripts developed by the TWDB.

Modeled Available Groundwater and Permitting

As defined in Chapter 36 of the Texas Water Code (2011), "modeled available groundwater" is the estimated average amount of water that may be produced annually to achieve a desired future condition. Groundwater conservation districts are required to consider modeled available groundwater, along with several other factors, when issuing permits in order to manage groundwater production to achieve the desired future condition(s). The other factors districts must consider include annual precipitation and production patterns, the estimated amount of pumping exempt from permitting, existing permits, and a reasonable estimate of actual groundwater production under existing permits.

PARAMETERS AND ASSUMPTIONS:

The parameters and assumptions for the 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 was the base model for this analysis. See Kelley and others (2014) for the assumptions and limitations of the historical calibrated model. Groundwater Management Area 8 constructed a predictive model simulation to extend the base model to 2080 for planning purposes. See Appendix E of Groundwater Management Area 8 (2021) for the assumptions of this predictive model simulation.

- 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).
- To be consistent with Groundwater Management Area 8, the TWDB model grid files dated August 26, 2015 (*trnt_n_grid_poly082615.csv* and *wdbn_grid_poly082615.csv* for the Trinity and Woodbine aquifers, respectively) were used to assign model cells to counties, groundwater management areas, groundwater conservation districts, river basins, and regional water planning areas.
- Drawdown was calculated as the difference in modeled water levels between the baseline date of January 1, 2010 (initial water levels) and the final date of December 31, 2080 (stress period 71) using a composite water level methodology described in Appendix A.
- During the predictive simulation model run, some model cells went dry, meaning the modeled water level fell below the bottom of the cell. The dry cell count at the baseline date of January 1, 2010 (initial water levels) and final date of December 31, 2080 (stress period 71) is presented in Table C1 of Appendix C. Appendix A describes how dry cells were handled in the drawdown calculations using the composite water level methodology. Pumping in dry cells was excluded from the modeled available groundwater calculations.
- The drawdown averages and modeled available groundwater values were calculated using the official TWDB boundaries for the Trinity and Woodbine aquifers.
- 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 was the base model for this analysis. See Jones (2003) for the assumptions and limitations of the historical calibrated model. During the previous planning cycle, a predictive model simulation was constructed to extend the base model and include a simulated repeat of the 1950s drought of record for planning purposes. See the previous GAM Run 08-010 MAG (Anaya, 2008) for the assumptions of this predictive model simulation.

- 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 modeled available groundwater values were determined using the monthly stress period within the predictive drought period with the lowest monthly springflow volume, which was assumed to represent the worst-case scenario for Salado Springs during a potential repeat of the 1950s drought of record.
- The modeled available groundwater values were calculated using the official TWDB Edwards (Balcones Fault Zone) Aquifer boundary.
- To be consistent with Groundwater Management Area 8, the TWDB model grid file dated August 26, 2015 (*ebfz_n_grid_poly082615.csv*) was used to assign model cells to counties, groundwater management areas, groundwater conservation districts, river basins, and regional water planning areas.
- Estimates of modeled streamflow and springflow 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 the Llano Uplift region was the base model for this analysis. See Shi and others (2016) for the assumptions and limitations of the historical calibrated model. Groundwater Management Area 8 constructed a predictive model simulation to extend the base model to 2080 for planning purposes. See Groundwater Management Area 8 (2021) for the assumptions of this predictive model simulation.
- 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).
- To be consistent with Groundwater Management Area 8, the TWDB model grid file dated January 7, 2016 (*lnup_grid_poly010716.csv*) was used to assign model cells to

counties, groundwater management areas, groundwater conservation districts, river basins, and regional water planning areas.

- Drawdown was calculated as the difference in modeled water level between the baseline date of January 1, 2010 (initial water levels) and the final date of December 31, 2080 (stress period 71), using the methodology described in Appendix B.
- During the predictive model run, some active model cells went dry, meaning the modeled water level fell below the bottom of the cell. The dry cell count at the baseline date of January 1, 2010 (initial water levels) and final date of December 31, 2080 (stress period 71) is presented in Table C2 of Appendix C). Appendix B describes how dry cells were handled in the drawdown calculations. Pumping in dry cells was excluded from the modeled available groundwater.
- To be consistent with the desired future conditions defined by Groundwater Management Area 8, the drawdown averages and modeled available groundwater values were calculated using the active model extent of Layers 3, 5, and 7 (Figures 10 through 12) for the Marble Falls, Ellenburger-San Saba, and Hickory aquifers, respectively, rather than the official TWDB boundaries for these aquifers.
- Estimates of modeled drawdown and available groundwater from the model simulation were rounded to whole numbers.

RESULTS:

The modeled available groundwater for the Trinity, Woodbine, Edwards (Balcones Fault Zone), Marble Falls, Ellenburger-San Saba, and Hickory aquifers are listed below:

- Trinity Aquifer (Paluxy aquifer) – The modeled available groundwater is approximately 24,520 acre-feet per year during the period from 2020 to 2080. Values are summarized by groundwater conservation district and county (Table 5) and by county, regional water planning group, and river basin (Table 17).
- Trinity Aquifer (Glen Rose Formation) – The modeled available groundwater is approximately 12,410 acre-feet per year during the period from 2020 to 2080. Values are summarized by groundwater conservation district and county (Table 6) and by county, regional water planning group, and river basin (Table 18).
- Trinity Aquifer (Twin Mountains Formation) – The modeled available groundwater is approximately 45,510 acre-feet per year during the period from 2020 to 2080. Values are summarized by groundwater conservation district and county (Table 7) and by county, regional water planning group, and river basin (Table 19).

- Trinity Aquifer (Travis Peak Formation) – The modeled available groundwater is approximately 98,230 acre-feet per year during the period from 2020 to 2080. Values are summarized by groundwater conservation district and county (Table 8) and by county, regional water planning group, and river basin (Table 20).
- Trinity Aquifer (Hensell aquifer) – The modeled available groundwater is approximately 27,120 acre-feet per year during the period from 2020 to 2080. Values are summarized by groundwater conservation district and county (Table 9) and by county, regional water planning group, and river basin (Table 21).
- Trinity Aquifer (Hosston aquifer) – The modeled available groundwater is approximately 67,730 acre-feet per year during the period from 2020 to 2080. Values are summarized by groundwater conservation district and county (Table 10) and by county, regional water planning group, and river basin (Table 22).
- Trinity Aquifer (Antlers Formation) – The modeled available groundwater is approximately 78,440 acre-feet per year during the period from 2020 to 2080. Values are summarized by groundwater conservation district and county (Table 11) and by county, regional water planning group, and river basin (Table 23).
- Woodbine Aquifer – The modeled available groundwater is approximately 30,570 acre-feet per year during the period from 2020 to 2080. Values are summarized by groundwater conservation district and county (Table 12) and by county, regional water planning group, and river basin (Table 24).
- Edwards (Balcones Fault Zone) Aquifer – The modeled available groundwater is approximately 15,170 acre-feet per year during the period from 2020 to 2080. Values are summarized by groundwater conservation district and county (Table 13) and by county, regional water planning group, and river basin (Table 25).
- Marble Falls Aquifer – The modeled available groundwater is approximately 5,630 acre-feet per year during the period from 2020 to 2080. Values are summarized by groundwater conservation district and county (Table 14) and by county, regional water planning group, and river basin (Table 26).
- Ellenburger-San Saba Aquifer – The modeled available groundwater is approximately 14,060 acre-feet per year during the period from 2020 to 2080. Values are summarized by groundwater conservation district and county (Table 15) and by county, regional water planning group, and river basin (Table 27).
- Hickory Aquifer – The modeled available groundwater is approximately 3,580 acre-feet per year during the period from 2020 to 2080. Values are summarized by groundwater conservation district and county (Table 16) and by county, regional water planning group, and river basin (Table 28).

Figures 1 through 7 show the extent of the Trinity Aquifer subunits (Paluxy, Glen Rose, Twin Mountains, Travis Peak, Hensell, Hosston, and Antlers formations, respectively). Figures 8 through 12 show the extent of the Woodbine, Edwards (Balcones Fault Zone), Marble Falls, Ellenburger-San Saba, and Hickory aquifers, respectively. Figure 13 shows the county, groundwater conservation district, regional water planning area, and river basin boundaries represented by the divisions in Tables 5 to 28.

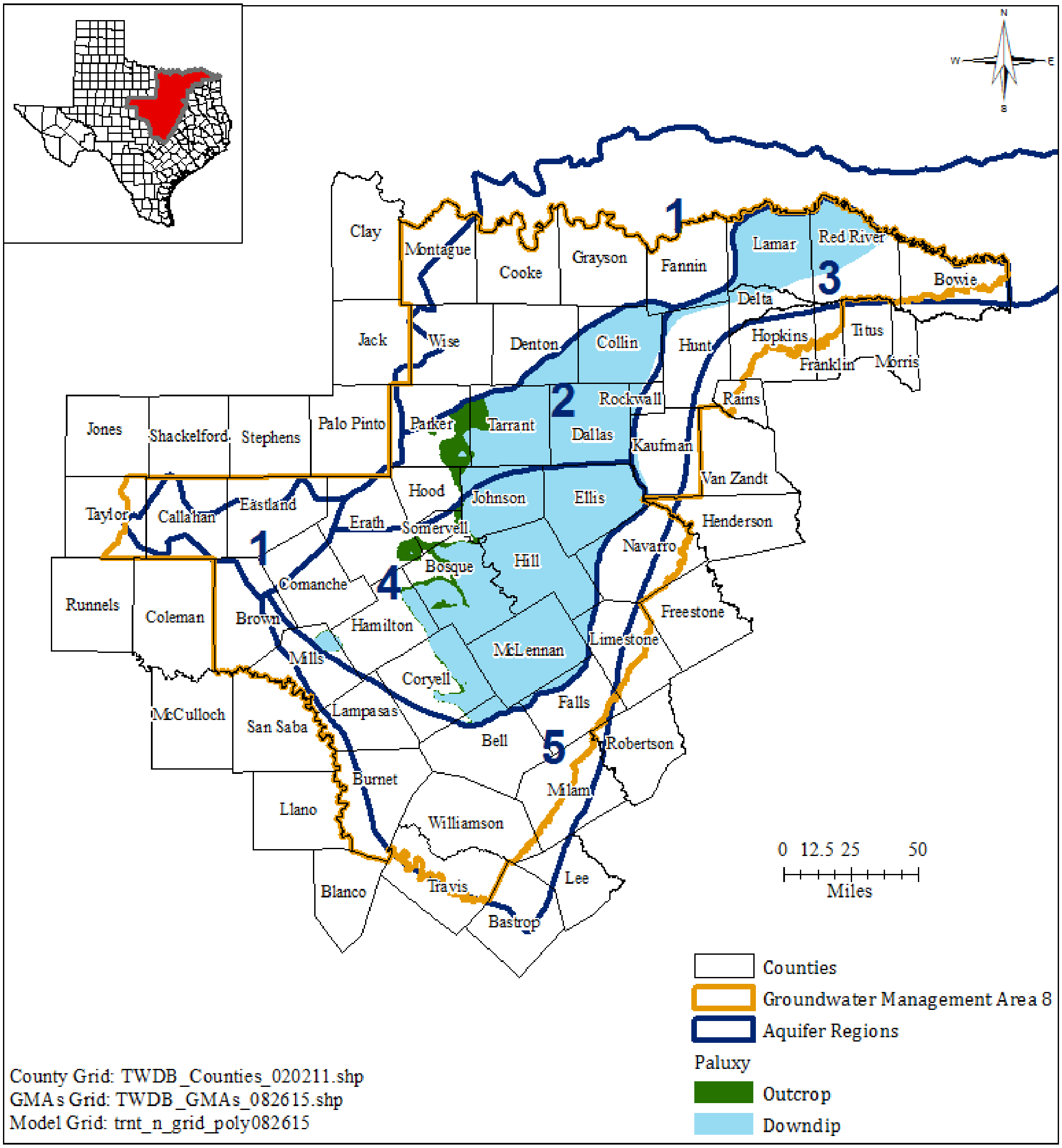

FIGURE 1. MAP SHOWING THE TRINITY AQUIFER (PALUXY) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR NORTHERN PORTION OF TRINITY AND WOODBINE AQUIFERS. SEE APPENDIX A FOR AQUIFER REGION DETAILS.

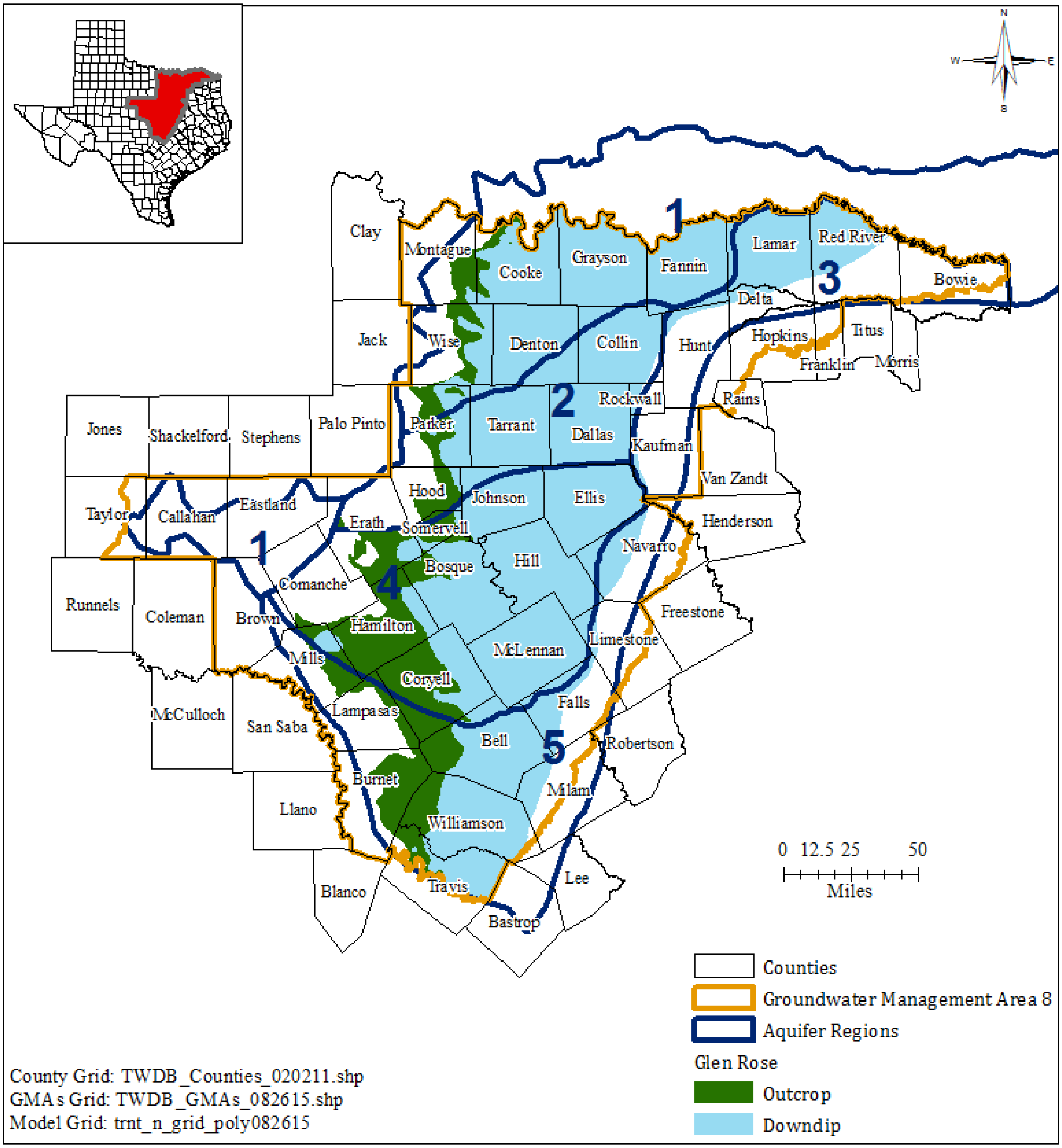

FIGURE 2. MAP SHOWING THE TRINITY AQUIFER (GLEN ROSE) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF TRINITY AND WOODBINE AQUIFERS. SEE APPENDIX A FOR AQUIFER REGION DETAILS.

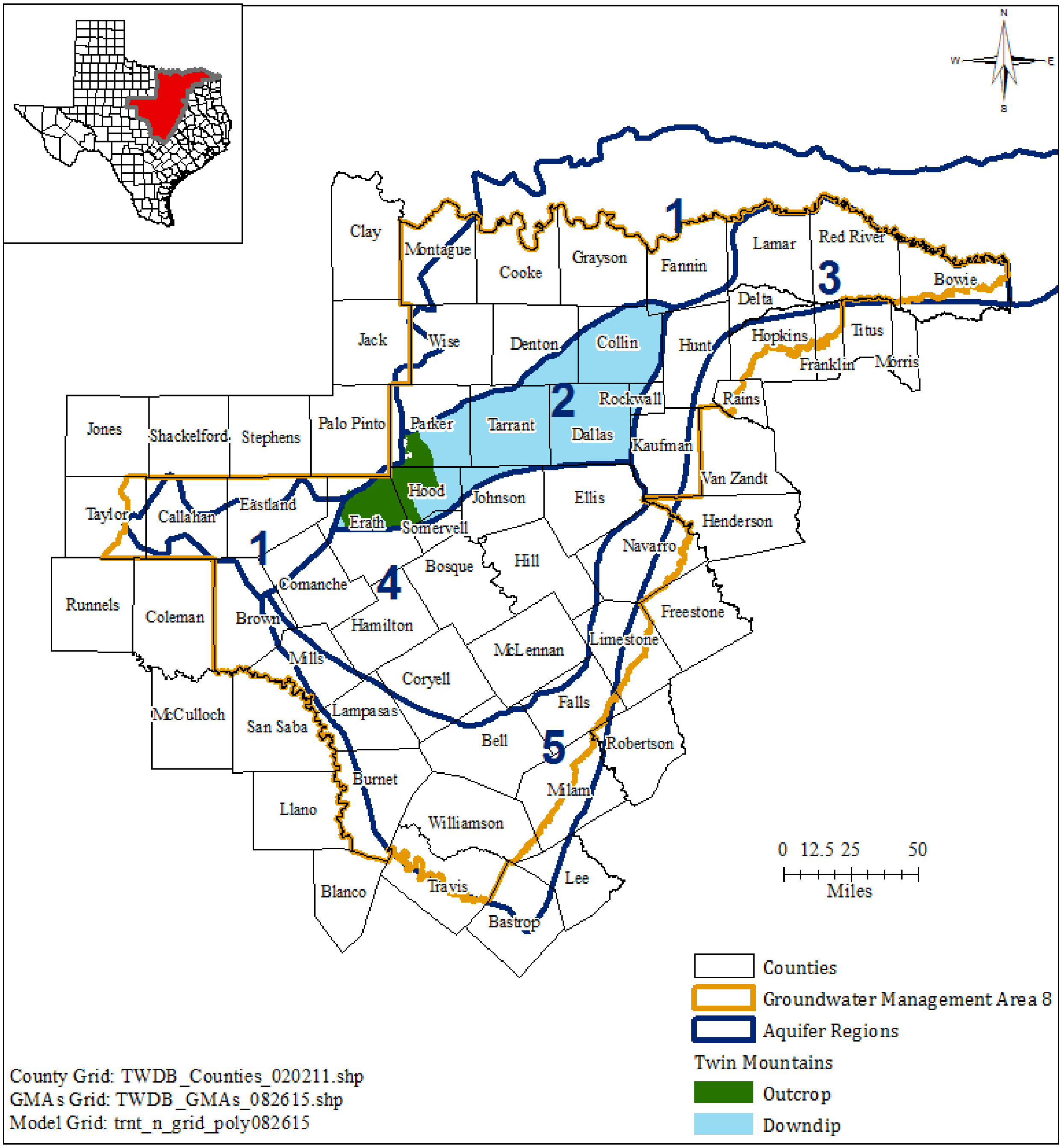

FIGURE 3. MAP SHOWING THE TRINITY AQUIFER (TWIN MOUNTAINS) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF TRINITY AND WOODBINE AQUIFERS. SEE APPENDIX A FOR AQUIFER REGION DETAILS.

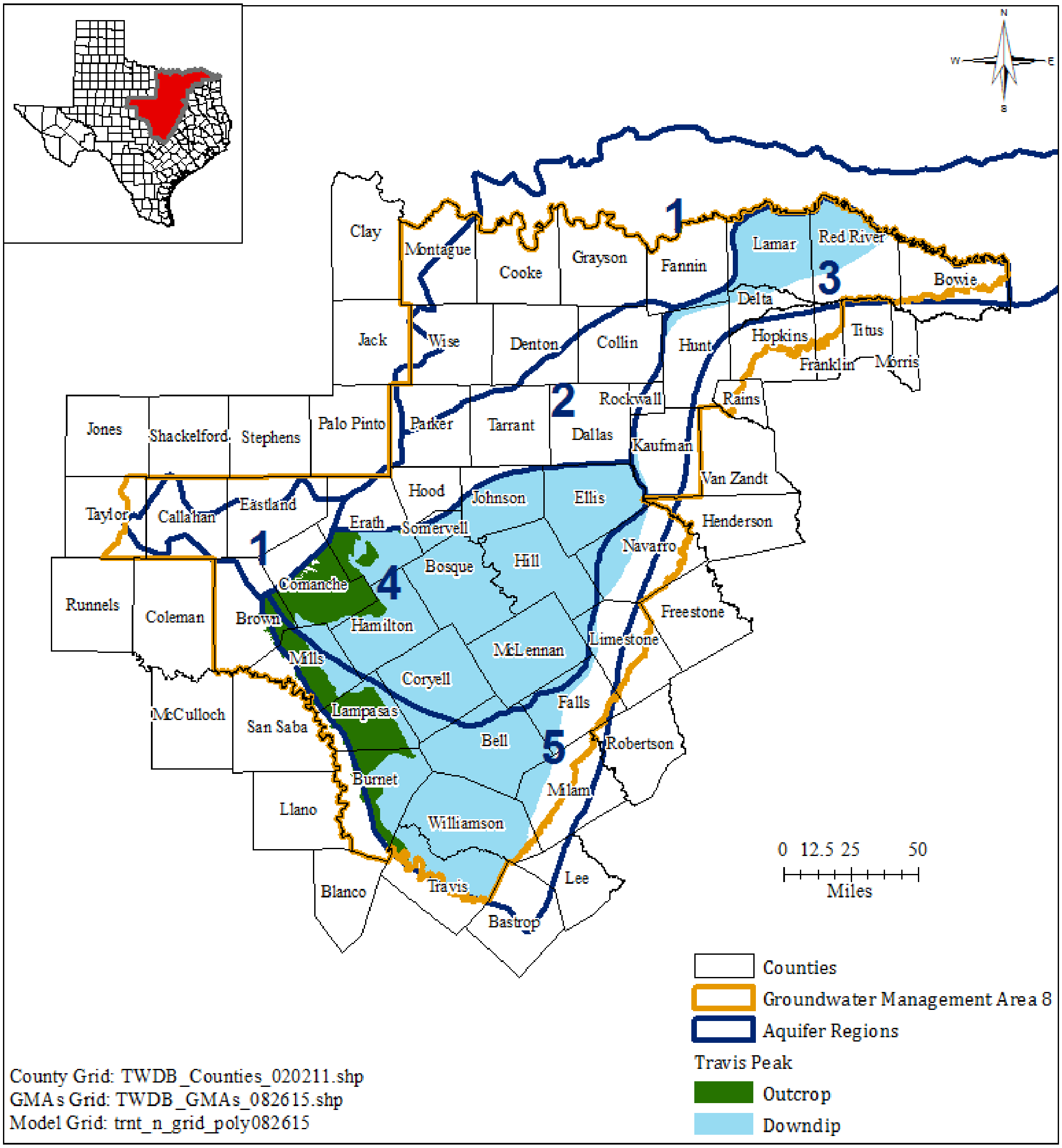

FIGURE 4. MAP SHOWING THE TRINITY AQUIFER (TRAVIS PEAK) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF TRINITY AND WOODBINE AQUIFERS. SEE APPENDIX A FOR AQUIFER REGION DETAILS.

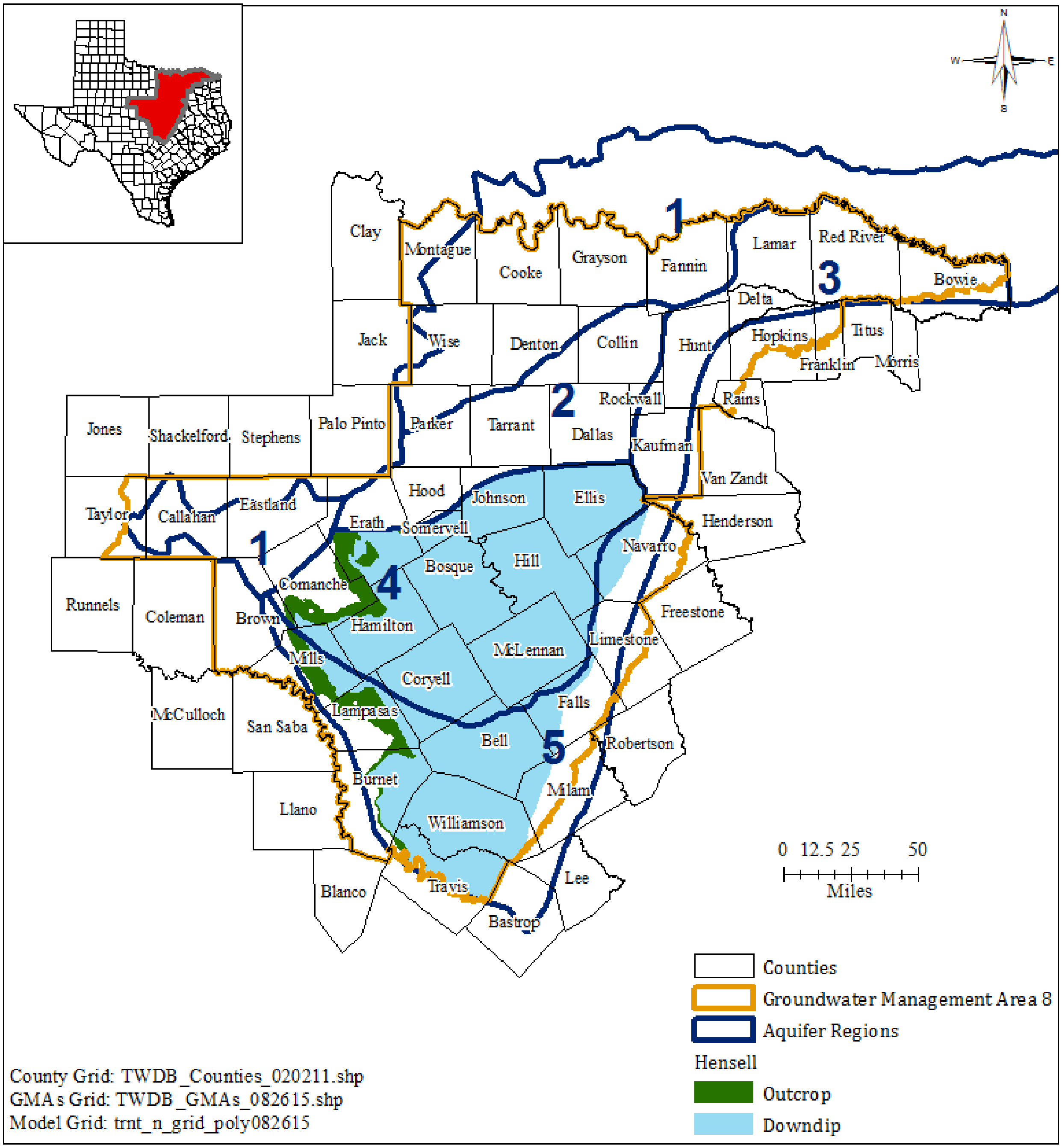

FIGURE 5. MAP SHOWING THE TRINITY AQUIFER (HENSELL) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF TRINITY AND WOODBINE AQUIFERS. SEE APPENDIX A FOR AQUIFER REGION DETAILS.

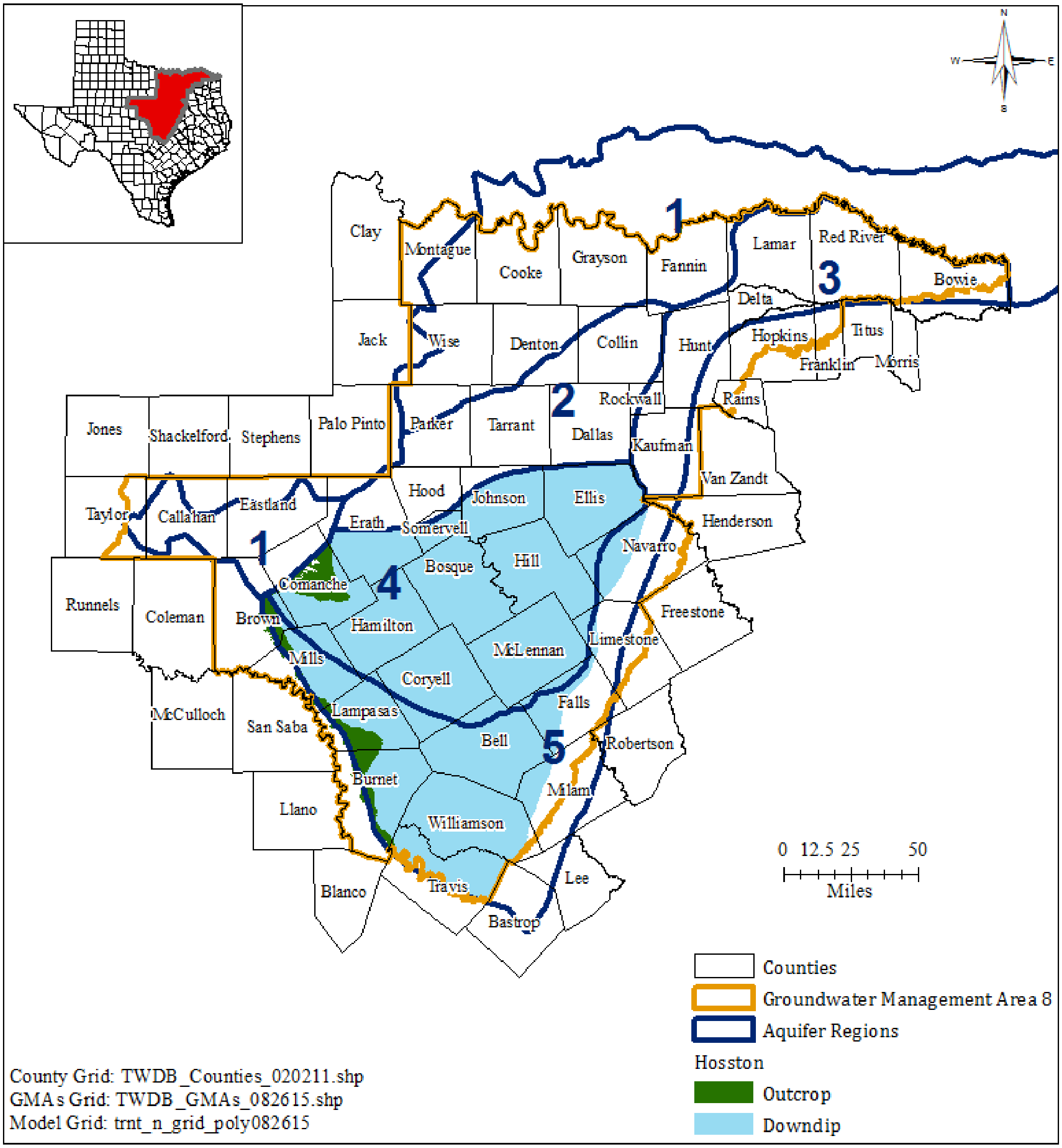

FIGURE 6. MAP SHOWING THE TRINITY AQUIFER (HOSSTON) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS. SEE APPENDIX A FOR AQUIFER REGION DETAILS.

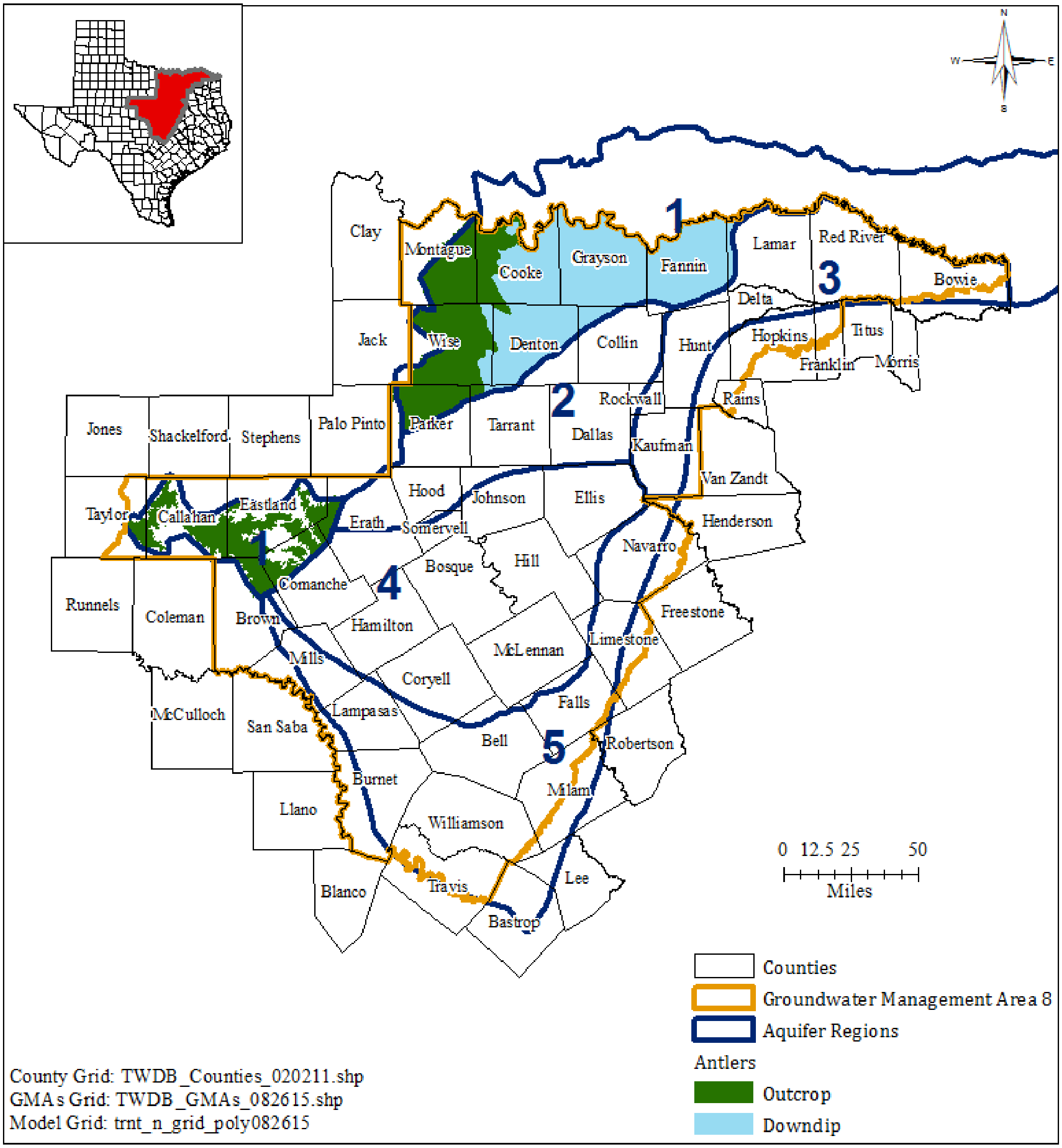

FIGURE 7. MAP SHOWING THE TRINITY AQUIFER (ANTLERS) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF TRINITY AND WOODBINE AQUIFERS. SEE APPENDIX A FOR AQUIFER REGION DETAILS.

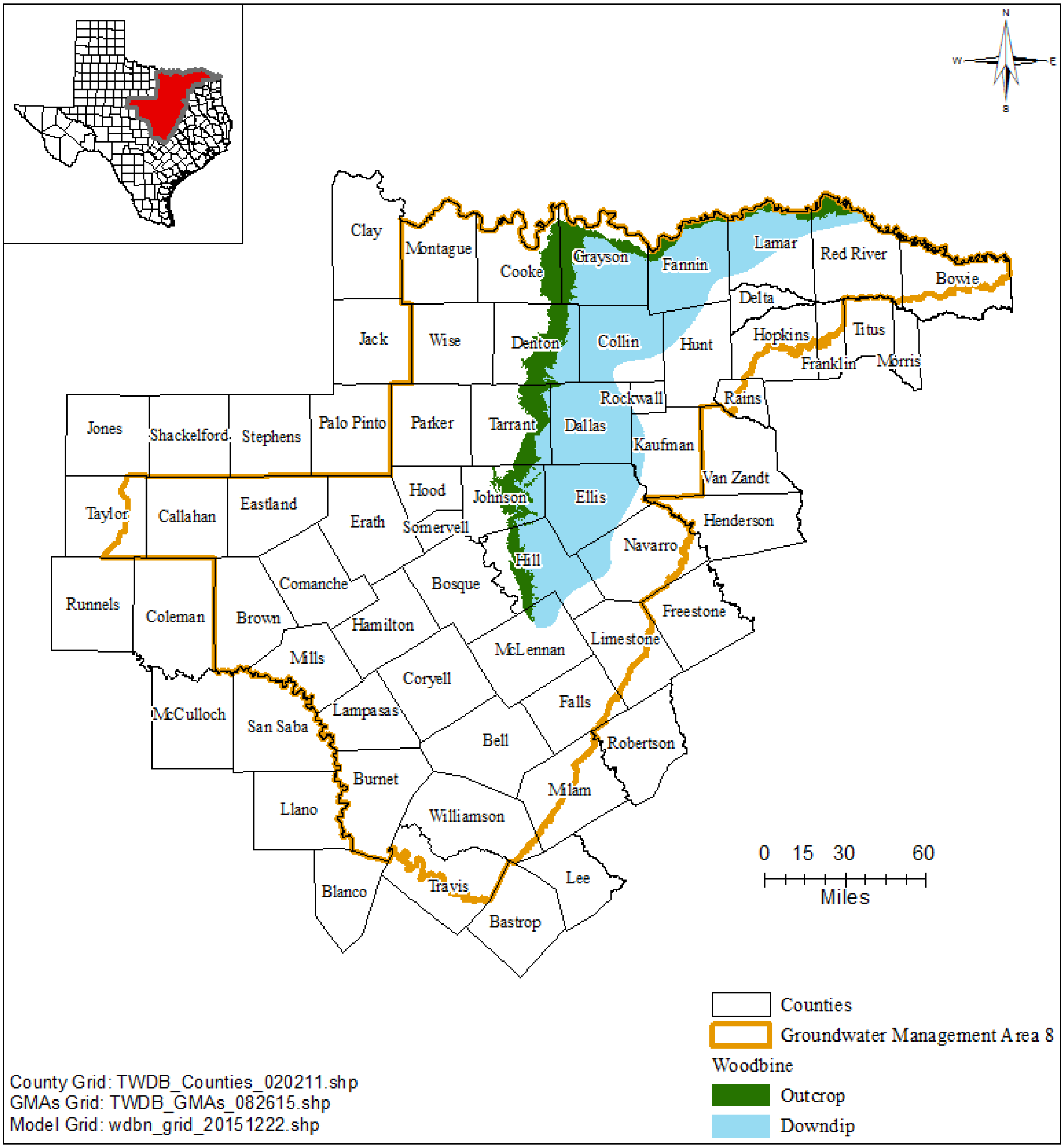

FIGURE 8. MAP SHOWING THE WOODBINE AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF TRINITY AND WOODBINE AQUIFERS.

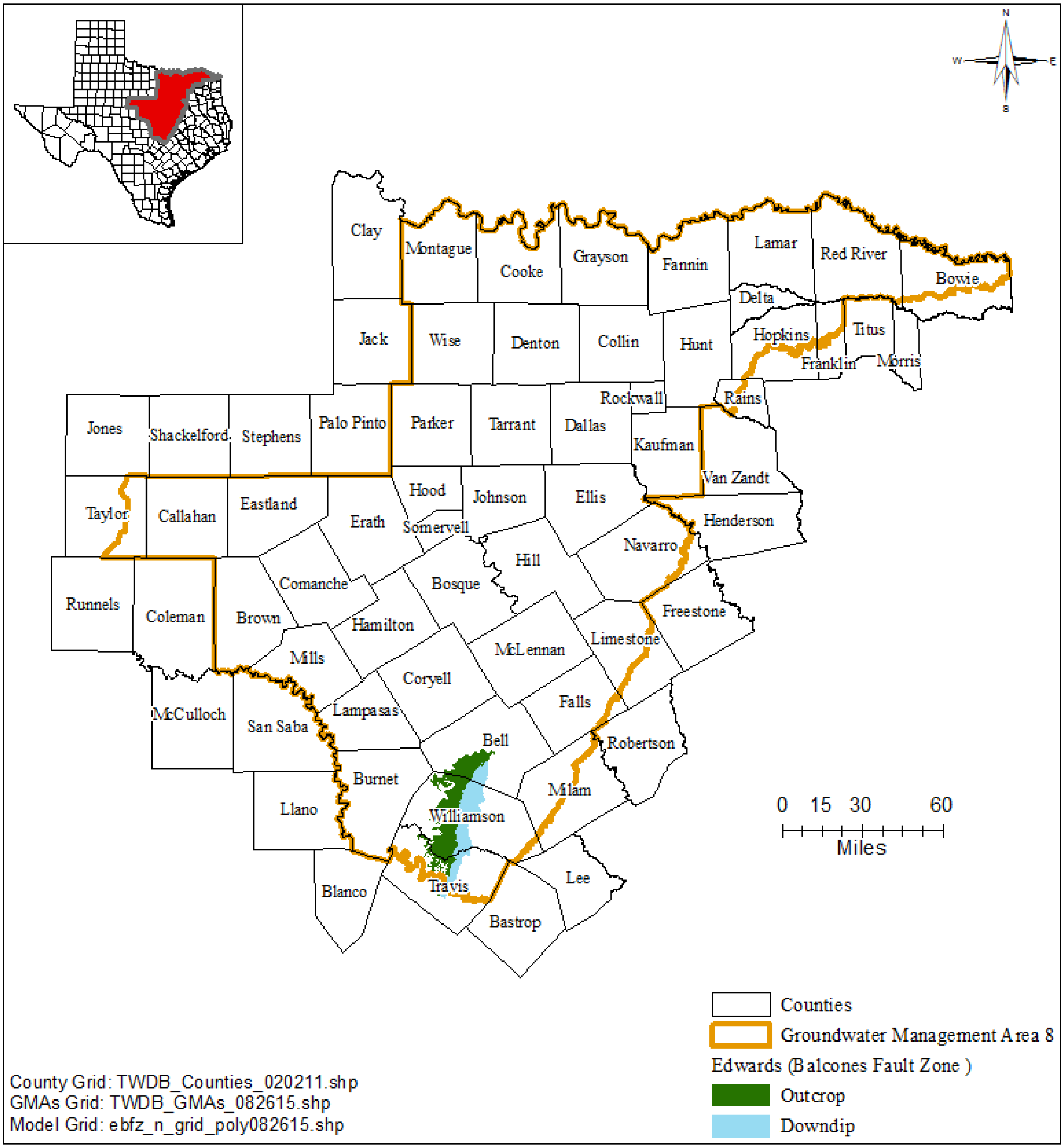

FIGURE 9. MAP SHOWING THE EDWARDS (BALCONES FAULT ZONE) AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN SEGMENT OF EDWARDS (BALCONES FAULT ZONE) AQUIFER.

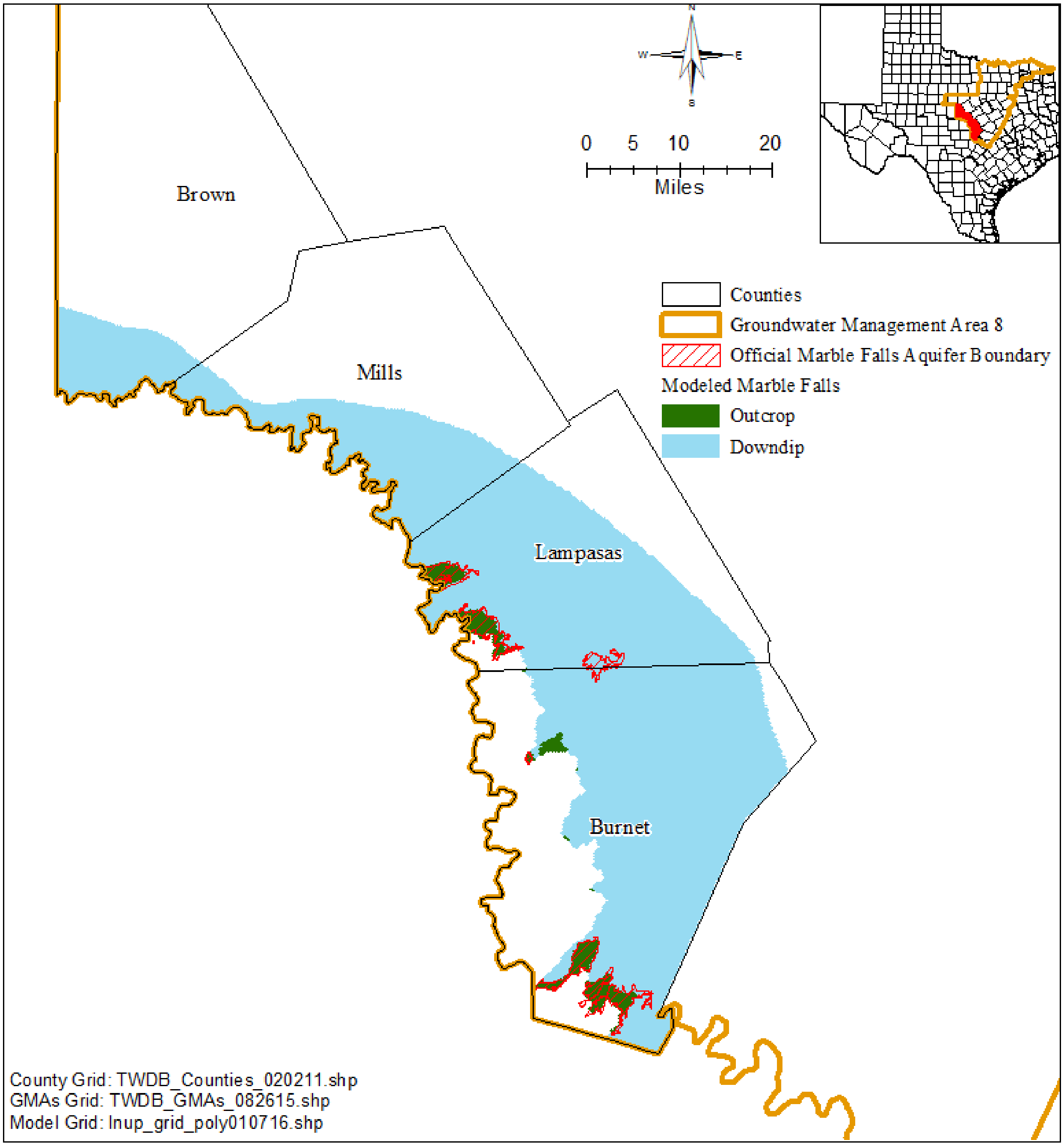

FIGURE 10. MAP SHOWING THE MARBLE FALLS AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE MINOR AQUIFERS IN THE LLANO UPLIFT REGION.

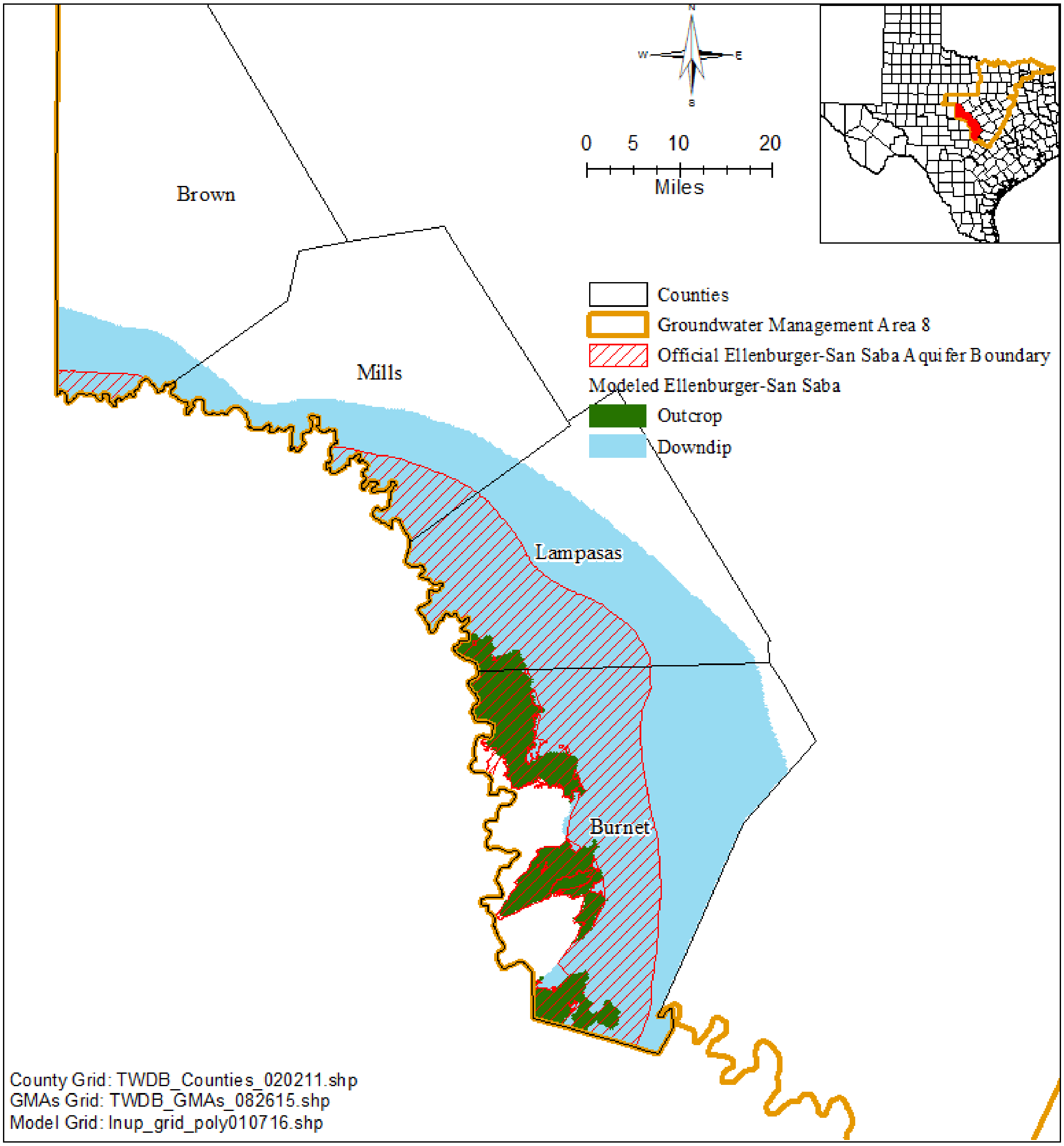

FIGURE 11. MAP SHOWING THE ELLENBURGER-SAN SABA AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE MINOR AQUIFERS IN THE LLANO UPLIFT REGION.

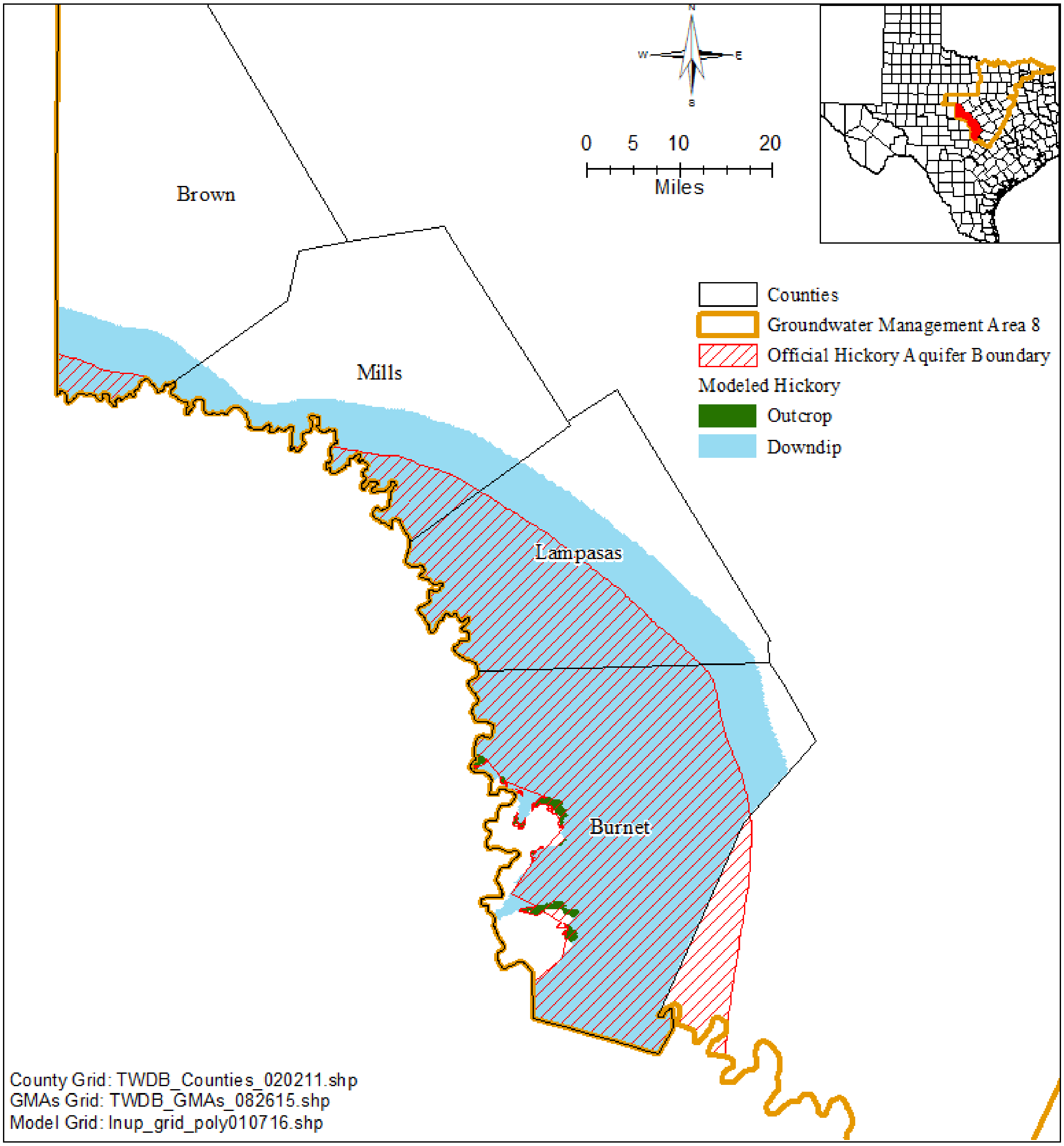

FIGURE 12. MAP SHOWING THE HICKORY AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE MINOR AQUIFERS IN THE LLANO UPLIFT REGION.

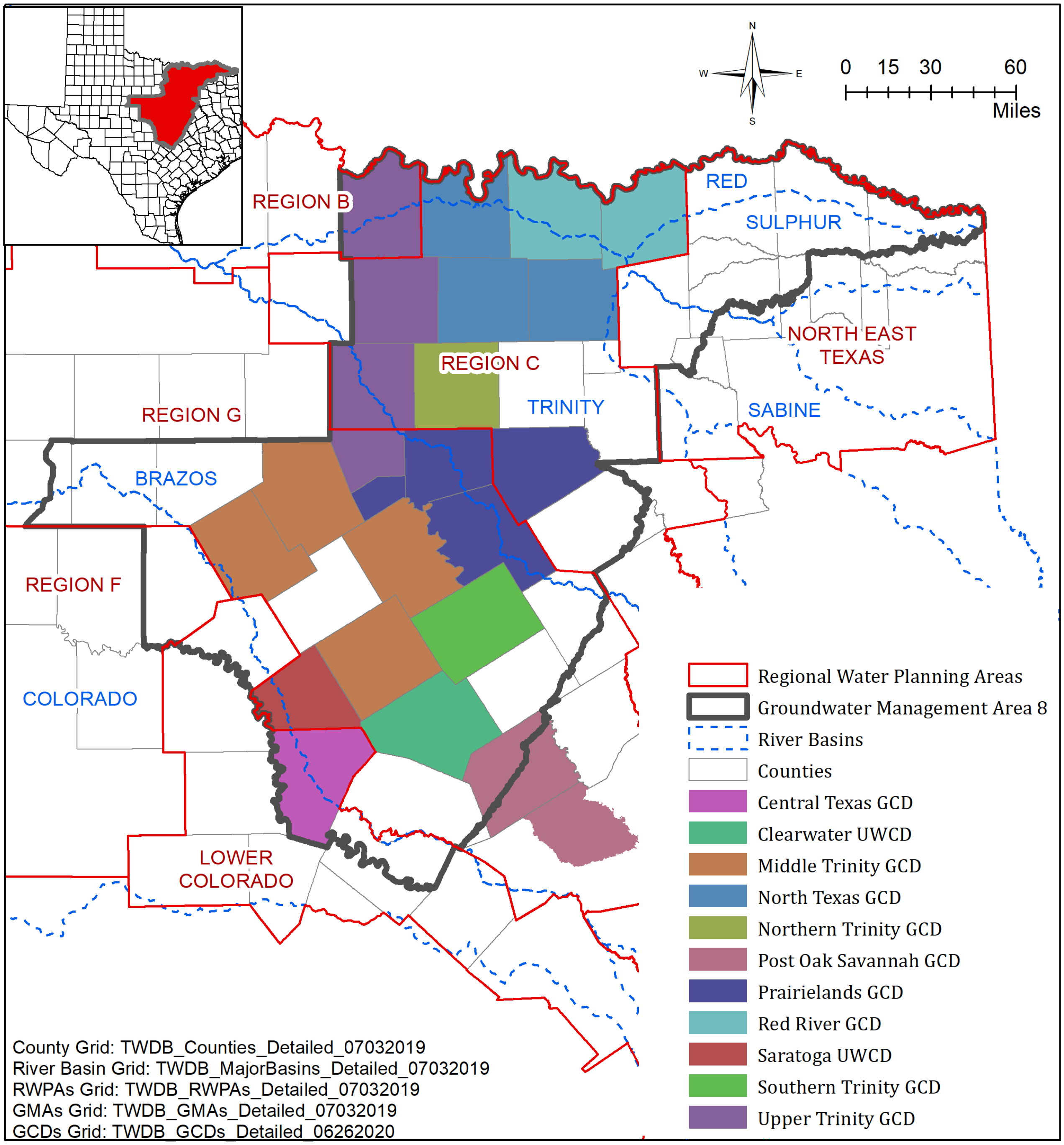

FIGURE 13. MAP SHOWING REGIONAL WATER PLANNING AREAS (RWPAs), GROUNDWATER CONSERVATION DISTRICTS (GCDs), AND RIVER BASINS ASSOCIATED WITH GROUNDWATER MANAGEMENT AREA 8.

TABLE 5. MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (PALUXY) IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Clearwater UWCD*	Bell	Paluxy	0	0	0	0	0	0	0
Clearwater UWCD Total		**Paluxy**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Middle Trinity GCD	Bosque	Paluxy	357	357	357	357	357	357	357
Middle Trinity GCD	Coryell	Paluxy	0	0	0	0	0	0	0
Middle Trinity GCD	Erath	Paluxy	61	61	61	61	61	61	61
Middle Trinity GCD Total		**Paluxy**	**418**	**418**	**418**	**418**	**418**	**418**	**418**
North Texas GCD	Collin	Paluxy	1,548	1,548	1,548	1,548	1,548	1,548	1,548
North Texas GCD	Denton	Paluxy	4,823	4,823	4,823	4,823	4,823	4,823	4,823
North Texas GCD Total		**Paluxy**	**6,371**	**6,371**	**6,371**	**6,371**	**6,371**	**6,371**	**6,371**
Northern Trinity GCD	Tarrant	Paluxy	8,963	8,963	8,963	8,963	8,963	8,963	8,963
Northern Trinity GCD Total		**Paluxy**	**8,963**	**8,963**	**8,963**	**8,963**	**8,963**	**8,963**	**8,963**
Prairielands GCD	Ellis	Paluxy	442	442	442	442	442	442	442
Prairielands GCD	Hill	Paluxy	352	352	352	352	352	352	352
Prairielands GCD	Johnson	Paluxy	2,442	2,442	2,442	2,442	2,442	2,442	2,442
Prairielands GCD	Somervell	Paluxy	14	14	14	14	14	14	14
Prairielands GCD Total		**Paluxy**	**3,250**	**3,250**	**3,250**	**3,250**	**3,250**	**3,250**	**3,250**
Red River GCD	Fannin	Paluxy	2,088	2,088	2,088	2,088	2,088	2,088	2,088
Red River GCD	Grayson	Paluxy	0	0	0	0	0	0	0
Red River GCD Total		**Paluxy**	**2,088**	**2,088**	**2,088**	**2,088**	**2,088**	**2,088**	**2,088**
Southern Trinity GCD	McLennan	Paluxy	0	0	0	0	0	0	0
Southern Trinity GCD Total		**Paluxy**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

TABLE 5 (CONT). MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (PALUXY) IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Upper Trinity GCD	Hood	Paluxy (outcrop)	159	159	159	159	159	159	159
Upper Trinity GCD	Parker	Paluxy (outcrop)	2,609	2,609	2,609	2,609	2,609	2,609	2,609
Upper Trinity GCD	Parker	Paluxy (downdip)	50	50	50	50	50	50	50
Upper Trinity GCD Total		**Paluxy**	**2,818**	**2,818**	**2,818**	**2,818**	**2,818**	**2,818**	**2,818**
No District	Dallas	Paluxy	359	359	359	359	359	359	359
No District	Delta	Paluxy	56	56	56	56	56	56	56
No District	Falls	Paluxy	0	0	0	0	0	0	0
No District	Hamilton	Paluxy	0	0	0	0	0	0	0
No District	Hunt	Paluxy	3	3	3	3	3	3	3
No District	Kaufman	Paluxy	0	0	0	0	0	0	0
No District	Lamar	Paluxy	8	8	8	8	8	8	8
No District	Limestone	Paluxy	0	0	0	0	0	0	0
No District	Mills	Paluxy	6	6	6	6	6	6	6
No District	Navarro	Paluxy	0	0	0	0	0	0	0
No District	Red River	Paluxy	177	177	177	177	177	177	177
No District	Rockwall	Paluxy	0	0	0	0	0	0	0
No District Total		**Paluxy**	**609**	**609**	**609**	**609**	**609**	**609**	**609**
GMA 8 Total		**Paluxy**	**24,517**	**24,517**	**24,517**	**24,517**	**24,517**	**24,517**	**24,517**

*UWCD: Underground Water Conservation District.

TABLE 6. MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (GLEN ROSE) IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Central Texas GCD	Burnet	Glen Rose	148	148	148	148	148	148	148
Central Texas GCD Total		**Glen Rose**	**148**	**148**	**148**	**148**	**148**	**148**	**148**
Clearwater UWCD	Bell	Glen Rose	275	275	275	275	275	275	275
Clearwater UWCD Total		**Glen Rose**	**275**	**275**	**275**	**275**	**275**	**275**	**275**
Middle Trinity GCD	Bosque	Glen Rose	729	729	729	729	729	729	729
Middle Trinity GCD	Comanche	Glen Rose	41	41	41	41	41	41	41
Middle Trinity GCD	Coryell	Glen Rose	120	120	120	120	120	120	120
Middle Trinity GCD	Erath	Glen Rose	1,078	1,078	1,078	1,078	1,078	1,078	1,078
Middle Trinity GCD Total		**Glen Rose**	**1,968**	**1,968**	**1,968**	**1,968**	**1,968**	**1,968**	**1,968**
North Texas GCD	Collin	Glen Rose	83	83	83	83	83	83	83
North Texas GCD	Denton	Glen Rose	339	339	339	339	339	339	339
North Texas GCD Total		**Glen Rose**	**422**	**422**	**422**	**422**	**422**	**422**	**422**
Northern Trinity GCD	Tarrant	Glen Rose	793	793	793	793	793	793	793
Northern Trinity GCD Total		**Glen Rose**	**793**	**793**	**793**	**793**	**793**	**793**	**793**
Post Oak Savannah GCD	Milam	Glen Rose	0	0	0	0	0	0	0
Post Oak Savannah GCD Total		**Glen Rose**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Prairielands GCD	Ellis	Glen Rose	50	50	50	50	50	50	50
Prairielands GCD	Hill	Glen Rose	115	115	115	115	115	115	115
Prairielands GCD	Johnson	Glen Rose	1,633	1,633	1,633	1,633	1,633	1,633	1,633
Prairielands GCD	Somervell	Glen Rose	146	146	146	146	146	146	146
Prairielands GCD Total		**Glen Rose**	**1,944**	**1,944**	**1,944**	**1,944**	**1,944**	**1,944**	**1,944**
Red River GCD	Fannin	Glen Rose	0	0	0	0	0	0	0
Red River GCD	Grayson	Glen Rose	0	0	0	0	0	0	0
Red River GCD Total		**Glen Rose**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

TABLE 6 (CONT). MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (GLEN ROSE) IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Saratoga UWCD	Lampasas	Glen Rose	68	68	68	68	68	68	68
Saratoga UWCD Total		**Glen Rose**	**68**	**68**	**68**	**68**	**68**	**68**	**68**
Southern Trinity GCD	McLennan	Glen Rose	0	0	0	0	0	0	0
Southern Trinity GCD Total		**Glen Rose**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Upper Trinity GCD	Hood	Glen Rose (outcrop)	790	790	790	790	790	790	790
Upper Trinity GCD	Hood	Glen Rose (downdip)	124	124	124	124	124	124	124
Upper Trinity GCD	Parker	Glen Rose (outcrop)	3,685	3,685	3,685	3,685	3,685	3,685	3,685
Upper Trinity GCD	Parker	Glen Rose (downdip)	1,406	1,406	1,406	1,406	1,406	1,406	1,406
Upper Trinity GCD Total			**6,005**	**6,005**	**6,005**	**6,005**	**6,005**	**6,005**	**6,005**
No District	Brown	Glen Rose	0	0	0	0	0	0	0
No District	Dallas	Glen Rose	131	131	131	131	131	131	131
No District	Delta	Glen Rose	0	0	0	0	0	0	0
No District	Falls	Glen Rose	0	0	0	0	0	0	0
No District	Hamilton	Glen Rose	218	218	218	218	218	218	218
No District	Hunt	Glen Rose	0	0	0	0	0	0	0
No District	Kaufman	Glen Rose	0	0	0	0	0	0	0
No District	Lamar	Glen Rose	0	0	0	0	0	0	0
No District	Limestone	Glen Rose	0	0	0	0	0	0	0
No District	Mills	Glen Rose	189	189	189	189	189	189	189
No District	Navarro	Glen Rose	0	0	0	0	0	0	0
No District	Red River	Glen Rose	0	0	0	0	0	0	0
No District	Rockwall	Glen Rose	0	0	0	0	0	0	0
No District	Travis	Glen Rose	100	100	100	100	100	100	100
No District	Williamson	Glen Rose	149	149	149	149	149	149	149
No District Total		**Glen Rose**	**787**	**787**	**787**	**787**	**787**	**787**	**787**
GMA 8 Total		**Glen Rose**	**12,410**	**12,410**	**12,410**	**12,410**	**12,410**	**12,410**	**12,410**

*UWCD: Underground Water Conservation District.

TABLE 7. MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (TWIN MOUNTAINS) IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Middle Trinity GCD	Erath	Twin Mountains	5,017	5,017	5,017	5,017	5,017	5,017	5,017
Middle Trinity GCD Total		**Twin Mountains**	**5,017**	**5,017**	**5,017**	**5,017**	**5,017**	**5,017**	**5,017**
North Texas GCD	Collin	Twin Mountains	2,202	2,202	2,202	2,202	2,202	2,202	2,202
North Texas GCD	Denton	Twin Mountains	8,372	8,372	8,372	8,372	8,372	8,372	8,372
North Texas GCD Total		**Twin Mountains**	**10,574**	**10,574**	**10,574**	**10,574**	**10,574**	**10,574**	**10,574**
Northern Trinity GCD	Tarrant	Twin Mountains	6,922	6,922	6,922	6,922	6,922	6,922	6,922
Northern Trinity GCD Total		**Twin Mountains**	**6,922**	**6,922**	**6,922**	**6,922**	**6,922**	**6,922**	**6,922**
Prairielands GCD	Ellis	Twin Mountains	0	0	0	0	0	0	0
Prairielands GCD	Johnson	Twin Mountains	278	278	278	278	278	278	278
Prairielands GCD	Somervell	Twin Mountains	65	65	65	65	65	65	65
Prairielands GCD Total		**Twin Mountains**	**343**	**343**	**343**	**343**	**343**	**343**	**343**
Red River GCD	Fannin	Twin Mountains	0	0	0	0	0	0	0
Red River GCD	Grayson	Twin Mountains	0	0	0	0	0	0	0
Red River GCD Total		**Twin Mountains**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Upper Trinity GCD	Hood (outcrop)	Twin Mountains (outcrop)	5,024	5,024	5,024	5,024	5,024	5,024	5,024
Upper Trinity GCD	Hood	Twin Mountains (downdip)	10,619	10,619	10,619	10,619	10,619	10,619	10,619
Upper Trinity GCD	Parker	Twin Mountains (outcrop)	1,282	1,282	1,282	1,282	1,282	1,282	1,282
Upper Trinity GCD	Parker	Twin Mountains (downdip)	2,528	2,528	2,528	2,528	2,528	2,528	2,528
Upper Trinity GCD Total		**Twin Mountains**	**19,453**	**19,453**	**19,453**	**19,453**	**19,453**	**19,453**	**19,453**

TABLE 7 (CONT). MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (TWIN MOUNTAINS) IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
No District	Dallas	Twin Mountains	3,201	3,201	3,201	3,201	3,201	3,201	3,201
No District	Hunt	Twin Mountains	0	0	0	0	0	0	0
No District	Kaufman	Twin Mountains	0	0	0	0	0	0	0
No District	Rockwall	Twin Mountains	0	0	0	0	0	0	0
No District Total		**Twin Mountains**	**3,201**	**3,201**	**3,201**	**3,201**	**3,201**	**3,201**	**3,201**
GMA 8 Total		**Twin Mountains**	**45,510**	**45,510**	**45,510**	**45,510**	**45,510**	**45,510**	**45,510**

TABLE 8. MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (TRAVIS PEAK) IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Central Texas GCD	Burnet	Travis Peak	3,742	3,742	3,742	3,742	3,742	3,742	3,742
Central Texas GCD Total		**Travis Peak**	**3,742**	**3,742**	**3,742**	**3,742**	**3,742**	**3,742**	**3,742**
Clearwater UWCD[1]	Bell	Travis Peak	9,000	9,000	9,000	9,000	9,000	9,000	9,000
Clearwater UWCD Total		**Travis Peak**	**9,000**	**9,000**	**9,000**	**9,000**	**9,000**	**9,000**	**9,000**
Middle Trinity GCD	Bosque	Travis Peak	7,683	7,683	7,683	7,683	7,683	7,683	7,683
Middle Trinity GCD	Comanche	Travis Peak	6,164	6,164	6,164	6,164	6,164	6,164	6,164
Middle Trinity GCD	Coryell	Travis Peak	4,374	4,374	4,374	4,374	4,374	4,374	4,374
Middle Trinity GCD	Erath	Travis Peak	11,824	11,824	11,824	11,824	11,824	11,824	11,824
Middle Trinity GCD Total		**Travis Peak**	**30,045**	**30,045**	**30,045**	**30,045**	**30,045**	**30,045**	**30,045**
Post Oak Savannah GCD	Milam	Travis Peak	0	0	0	0	0	0	0
Post Oak Savannah GCD Total		**Travis Peak**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Prairielands GCD	Ellis	Travis Peak	5,676	5,676	5,676	5,676	5,676	5,676	5,676
Prairielands GCD	Hill	Travis Peak	4,685	4,685	4,685	4,685	4,685	4,685	4,685
Prairielands GCD	Johnson	Travis Peak	4,472	4,472	4,472	4,472	4,472	4,472	4,472
Prairielands GCD	Somervell	Travis Peak	1,763	1,763	1,763	1,763	1,763	1,763	1,763
Prairielands GCD Total		**Travis Peak**	**16,596**	**16,596**	**16,596**	**16,596**	**16,596**	**16,596**	**16,596**
Red River GCD	Fannin	Travis Peak	0	0	0	0	0	0	0
Red River GCD Total		**Travis Peak**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Saratoga UWCD	Lampasas	Travis Peak	1,593	1,593	1,593	1,593	1,593	1,593	1,593
Saratoga UWCD Total		**Travis Peak**	**1,593**	**1,593**	**1,593**	**1,593**	**1,593**	**1,593**	**1,593**
Southern Trinity GCD	McLennan	Travis Peak	20,649	20,649	20,649	20,649	20,649	20,649	20,649
Southern Trinity GCD Total		**Travis Peak**	**20,649**	**20,649**	**20,649**	**20,649**	**20,649**	**20,649**	**20,649**
Upper Trinity GCD[2]	Hood	Travis Peak	122	122	122	122	122	122	122
Upper Trinity GCD Total[2]		**Travis Peak**	**122**	**122**	**122**	**122**	**122**	**122**	**122**

TABLE 8 (CONT). MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (TRAVIS PEAK) IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
No District	Brown	Travis Peak	384	384	384	384	384	384	384
No District	Dallas	Travis Peak	0	0	0	0	0	0	0
No District	Delta	Travis Peak	0	0	0	0	0	0	0
No District	Falls	Travis Peak	1,435	1,435	1,435	1,435	1,435	1,435	1,435
No District	Hamilton	Travis Peak	2,209	2,209	2,209	2,209	2,209	2,209	2,209
No District	Hunt	Travis Peak	0	0	0	0	0	0	0
No District	Kaufman	Travis Peak	0	0	0	0	0	0	0
No District	Lamar	Travis Peak	0	0	0	0	0	0	0
No District	Limestone	Travis Peak	0	0	0	0	0	0	0
No District	Mills	Travis Peak	2,264	2,264	2,264	2,264	2,264	2,264	2,264
No District	Navarro	Travis Peak	0	0	0	0	0	0	0
No District	Red River	Travis Peak	0	0	0	0	0	0	0
No District	Travis	Travis Peak	6,644	6,644	6,644	6,644	6,644	6,644	6,644
No District	Williamson	Travis Peak	3,548	3,548	3,548	3,548	3,548	3,548	3,548
No District Total		**Travis Peak**	**16,484**	**16,484**	**16,484**	**16,484**	**16,484**	**16,484**	**16,484**
GMA 8 Total		**Travis Peak**	**98,231**	**98,231**	**98,231**	**98,231**	**98,231**	**98,231**	**98,231**

[1]UWCD: Underground Water Conservation District.
[2]Splits for Upper Trinity GCD are presented since they are included in the GMA 8-wide desired future conditions.

TABLE 9. MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (HENSELL) IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Central Texas GCD	Burnet	Hensell	2,662	2,662	2,662	2,662	2,662	2,662	2,662
Central Texas GCD Total		**Hensell**	**2,662**	**2,662**	**2,662**	**2,662**	**2,662**	**2,662**	**2,662**
Clearwater UWCD[1]	Bell	Hensell	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Clearwater UWCD Total		**Hensell**	**1,100**	**1,100**	**1,100**	**1,100**	**1,100**	**1,100**	**1,100**
Middle Trinity GCD	Bosque	Hensell	3,837	3,837	3,837	3,837	3,837	3,837	3,837
Middle Trinity GCD	Comanche	Hensell	204	204	204	204	204	204	204
Middle Trinity GCD	Coryell	Hensell	2,197	2,197	2,197	2,197	2,197	2,197	2,197
Middle Trinity GCD	Erath	Hensell	5,141	5,141	5,141	5,141	5,141	5,141	5,141
Middle Trinity GCD Total		**Hensell**	**11,379**	**11,379**	**11,379**	**11,379**	**11,379**	**11,379**	**11,379**
Post Oak Savannah GCD	Milam	Hensell	0	0	0	0	0	0	0
Post Oak Savannah GCD Total		**Hensell**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Prairielands GCD	Ellis	Hensell	0	0	0	0	0	0	0
Prairielands GCD	Hill	Hensell	25	25	25	25	25	25	25
Prairielands GCD	Johnson	Hensell	119	119	119	119	119	119	119
Prairielands GCD	Somervell	Hensell	217	217	217	217	217	217	217
Prairielands GCD Total		**Hensell**	**361**	**361**	**361**	**361**	**361**	**361**	**361**
Saratoga UWCD	Lampasas	Hensell	713	713	713	713	713	713	713
Saratoga UWCD Total		**Hensell**	**713**	**713**	**713**	**713**	**713**	**713**	**713**
Southern Trinity GCD	McLennan	Hensell	4,701	4,701	4,701	4,701	4,701	4,701	4,701
Southern Trinity GCD Total		**Hensell**	**4,701**	**4,701**	**4,701**	**4,701**	**4,701**	**4,701**	**4,701**
Upper Trinity GCD[2]	Hood	Hensell	50	50	50	50	50	50	50
Upper Trinity GCD Total[2]		**Hensell**	**50**	**50**	**50**	**50**	**50**	**50**	**50**

TABLE 9 (CONT). MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (HENSELL) IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
No District	Brown	Hensell	4	4	4	4	4	4	4
No District	Dallas	Hensell	0	0	0	0	0	0	0
No District	Falls	Hensell	0	0	0	0	0	0	0
No District	Hamilton	Hensell	1,672	1,672	1,672	1,672	1,672	1,672	1,672
No District	Kaufman	Hensell	0	0	0	0	0	0	0
No District	Limestone	Hensell	0	0	0	0	0	0	0
No District	Mills	Hensell	607	607	607	607	607	607	607
No District	Navarro	Hensell	0	0	0	0	0	0	0
No District	Travis	Hensell	2,269	2,269	2,269	2,269	2,269	2,269	2,269
No District	Williamson	Hensell	1,599	1,599	1,599	1,599	1,599	1,599	1,599
No District Total		**Hensell**	**6,151**	**6,151**	**6,151**	**6,151**	**6,151**	**6,151**	**6,151**
GMA 8 Total		**Hensell**	**27,117**	**27,117**	**27,117**	**27,117**	**27,117**	**27,117**	**27,117**

[1]UWCD: Underground Water Conservation District.
[2]Splits for Upper Trinity GCD are presented since they are included in the GMA 8-wide desired future conditions.
*Note that the Hensell values in this table represent a portion of the total Travis Peak values already provided in Table 8 and do not represent an additional source of water.

TABLE 10. MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (HOSSTON) IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Central Texas GCD	Burnet	Hosston	883	883	883	883	883	883	883
Central Texas GCD Total		**Hosston**	**883**	**883**	**883**	**883**	**883**	**883**	**883**
Clearwater UWCD[1]	Bell	Hosston	7,900	7,900	7,900	7,900	7,900	7,900	7,900
Clearwater UWCD Total		**Hosston**	**7,900**	**7,900**	**7,900**	**7,900**	**7,900**	**7,900**	**7,900**
Middle Trinity GCD	Bosque	Hosston	3,765	3,765	3,765	3,765	3,765	3,765	3,765
Middle Trinity GCD	Comanche	Hosston	5,869	5,869	5,869	5,869	5,869	5,869	5,869
Middle Trinity GCD	Coryell	Hosston	2,163	2,163	2,163	2,163	2,163	2,163	2,163
Middle Trinity GCD	Erath	Hosston	6,387	6,387	6,387	6,387	6,387	6,387	6,387
Middle Trinity GCD Total		**Hosston**	**18,184**	**18,184**	**18,184**	**18,184**	**18,184**	**18,184**	**18,184**
Post Oak Savannah GCD	Milam	Hosston	0	0	0	0	0	0	0
Post Oak Savannah GCD Total		**Hosston**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Prairielands GCD	Ellis	Hosston	5,545	5,545	5,545	5,545	5,545	5,545	5,545
Prairielands GCD	Hill	Hosston	3,610	3,610	3,610	3,610	3,610	3,610	3,610
Prairielands GCD	Johnson	Hosston	4,251	4,251	4,251	4,251	4,251	4,251	4,251
Prairielands GCD	Somervell	Hosston	930	930	930	930	930	930	930
Prairielands GCD Total		**Hosston**	**14,336**	**14,336**	**14,336**	**14,336**	**14,336**	**14,336**	**14,336**
Saratoga UWCD	Lampasas	Hosston	849	849	849	849	849	849	849
Saratoga UWCD Total		**Hosston**	**849**	**849**	**849**	**849**	**849**	**849**	**849**
Southern Trinity GCD	McLennan	Hosston	15,948	15,948	15,948	15,948	15,948	15,948	15,948
Southern Trinity GCD Total		**Hosston**	**15,948**	**15,948**	**15,948**	**15,948**	**15,948**	**15,948**	**15,948**
Upper Trinity GCD[2]	Hood	Hosston	72	72	72	72	72	72	72
Upper Trinity GCD Total[2]		**Hosston**	**72**	**72**	**72**	**72**	**72**	**72**	**72**

TABLE 10 (CONT). MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (HOSSTON) IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
No District	Brown	Hosston	346	346	346	346	346	346	346
No District	Dallas	Hosston	0	0	0	0	0	0	0
No District	Falls	Hosston	1,435	1,435	1,435	1,435	1,435	1,435	1,435
No District	Hamilton	Hosston	385	385	385	385	385	385	385
No District	Kaufman	Hosston	0	0	0	0	0	0	0
No District	Limestone	Hosston	0	0	0	0	0	0	0
No District	Mills	Hosston	1,455	1,455	1,455	1,455	1,455	1,455	1,455
No District	Navarro	Hosston	0	0	0	0	0	0	0
No District	Travis	Hosston	4,185	4,185	4,185	4,185	4,185	4,185	4,185
No District	Williamson	Hosston	1,750	1,750	1,750	1,750	1,750	1,750	1,750
No District Total		**Hosston**	**9,556**	**9,556**	**9,556**	**9,556**	**9,556**	**9,556**	**9,556**
GMA 8 Total		**Hosston**	**67,728**	**67,728**	**67,728**	**67,728**	**67,728**	**67,728**	**67,728**

[1]UWCD: Underground Water Conservation District.
[2]Splits for Upper Trinity GCD are presented since they are included in the GMA 8-wide desired future conditions.
*Note that the Hosston values in this table represent a portion of the total Travis Peak values already provided in Table 8 and do not represent an additional source of water.

TABLE 11. MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (ANTLERS) IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Middle Trinity GCD	Comanche	Antlers	5,843	5,843	5,843	5,843	5,843	5,843	5,843
Middle Trinity GCD	Erath	Antlers	2,627	2,627	2,627	2,627	2,627	2,627	2,627
Middle Trinity GCD Total		**Antlers**	**8,470**	**8,470**	**8,470**	**8,470**	**8,470**	**8,470**	**8,470**
North Texas GCD	Collin	Antlers	1,962	1,962	1,962	1,962	1,962	1,962	1,962
North Texas GCD	Cooke	Antlers	10,522	10,522	10,522	10,522	10,522	10,522	10,522
North Texas GCD	Denton	Antlers	16,557	16,557	16,557	16,557	16,557	16,557	16,557
North Texas GCD Total		**Antlers**	**29,041**	**29,041**	**29,041**	**29,041**	**29,041**	**29,041**	**29,041**
Northern Trinity GCD	Tarrant	Antlers	1,248	1,248	1,248	1,248	1,248	1,248	1,248
Northern Trinity GCD Total		**Antlers**	**1,248**	**1,248**	**1,248**	**1,248**	**1,248**	**1,248**	**1,248**
Red River GCD	Fannin	Antlers	0	0	0	0	0	0	0
Red River GCD	Grayson	Antlers	10,716	10,716	10,716	10,716	10,716	10,716	10,716
Red River GCD Total		**Antlers**	**10,716**	**10,716**	**10,716**	**10,716**	**10,716**	**10,716**	**10,716**
Upper Trinity GCD	Montague	Antlers (outcrop)	6,103	6,103	6,103	6,103	6,103	6,103	6,103
Upper Trinity GCD	Parker	Antlers (outcrop)	2,889	2,889	2,889	2,889	2,889	2,889	2,889
Upper Trinity GCD	Wise	Antlers (outcrop)	9,013	9,013	9,013	9,013	9,013	9,013	9,013
Upper Trinity GCD	Wise	Antlers (downdip)	2,439	2,439	2,439	2,439	2,439	2,439	2,439
Upper Trinity GCD Total		**Antlers**	**20,444**	**20,444**	**20,444**	**20,444**	**20,444**	**20,444**	**20,444**
No District	Brown	Antlers	1,043	1,043	1,043	1,043	1,043	1,043	1,043
No District	Callahan	Antlers	1,726	1,726	1,726	1,726	1,726	1,726	1,726
No District	Eastland	Antlers	5,736	5,736	5,736	5,736	5,736	5,736	5,736
No District	Lamar	Antlers	0	0	0	0	0	0	0
No District	Red River	Antlers	0	0	0	0	0	0	0
No District	Taylor	Antlers	13	13	13	13	13	13	13
No District Total		**Antlers**	**8,518**	**8,518**	**8,518**	**8,518**	**8,518**	**8,518**	**8,518**
GMA 8 Total		**Antlers**	**78,437**	**78,437**	**78,437**	**78,437**	**78,437**	**78,437**	**78,437**

TABLE 12. MODELED AVAILABLE GROUNDWATER FOR THE WOODBINE AQUIFER IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
North Texas GCD	Collin	Woodbine	4,254	4,254	4,254	4,254	4,254	4,254	4,254
North Texas GCD	Cooke	Woodbine	800	800	800	800	800	800	800
North Texas GCD	Denton	Woodbine	3,609	3,609	3,609	3,609	3,609	3,609	3,609
North Texas GCD Total		**Woodbine**	**8,663**	**8,663**	**8,663**	**8,663**	**8,663**	**8,663**	**8,663**
Northern Trinity GCD	Tarrant	Woodbine	1,139	1,139	1,139	1,139	1,139	1,139	1,139
Northern Trinity GCD Total		**Woodbine**	**1,139**	**1,139**	**1,139**	**1,139**	**1,139**	**1,139**	**1,139**
Prairielands GCD	Ellis	Woodbine	2,074	2,074	2,074	2,074	2,074	2,074	2,074
Prairielands GCD	Hill	Woodbine	587	587	587	587	587	587	587
Prairielands GCD	Johnson	Woodbine	1,981	1,981	1,981	1,981	1,981	1,981	1,981
Prairielands GCD Total		**Woodbine**	**4,642**	**4,642**	**4,642**	**4,642**	**4,642**	**4,642**	**4,642**
Red River GCD	Fannin	Woodbine	4,924	4,924	4,924	4,924	4,924	4,924	4,924
Red River GCD	Grayson	Woodbine	7,526	7,526	7,526	7,526	7,526	7,526	7,526
Red River GCD Total		**Woodbine**	**12,450**	**12,450**	**12,450**	**12,450**	**12,450**	**12,450**	**12,450**
Southern Trinity GCD	McLennan	Woodbine	0	0	0	0	0	0	0
Southern Trinity GCD Total		**Woodbine**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
No District	Dallas	Woodbine	2,798	2,798	2,798	2,798	2,798	2,798	2,798
No District	Hunt	Woodbine	763	763	763	763	763	763	763
No District	Kaufman	Woodbine	0	0	0	0	0	0	0
No District	Lamar	Woodbine	49	49	49	49	49	49	49
No District	Navarro	Woodbine	68	68	68	68	68	68	68
No District	Red River	Woodbine	2	2	2	2	2	2	2
No District	Rockwall	Woodbine	0	0	0	0	0	0	0
No District Total		**Woodbine**	**3,680**	**3,680**	**3,680**	**3,680**	**3,680**	**3,680**	**3,680**
GMA 8 Total		**Woodbine**	**30,574**	**30,574**	**30,574**	**30,574**	**30,574**	**30,574**	**30,574**

TABLE 13. MODELED AVAILABLE GROUNDWATER FOR THE EDWARDS (BALCONES FAULT ZONE) AQUIFER IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Clearwater UWCD*	Bell	Edwards (Balcones Fault Zone)	6,469	6,469	6,469	6,469	6,469	6,469	6,469
Clearwater UWCD Total		**Edwards (Balcones Fault Zone)**	**6,469**	**6,469**	**6,469**	**6,469**	**6,469**	**6,469**	**6,469**
No District	Travis	Edwards (Balcones Fault Zone)	5,237	5,237	5,237	5,237	5,237	5,237	5,237
No District	Williamson	Edwards (Balcones Fault Zone)	3,462	3,462	3,462	3,462	3,462	3,462	3,462
No District Total		**Edwards (Balcones Fault Zone)**	**8,699**	**8,699**	**8,699**	**8,699**	**8,699**	**8,699**	**8,699**
GMA 8 Total		**Edwards (Balcones Fault Zone)**	**15,168**	**15,168**	**15,168**	**15,168**	**15,168**	**15,168**	**15,168**

*UWCD: Underground Water Conservation District.

TABLE 14. MODELED AVAILABLE GROUNDWATER FOR THE MARBLE FALLS AQUIFER IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Central Texas GCD	Burnet	Marble Falls	2,738	2,738	2,738	2,738	2,738	2,738	2,738
Central Texas GCD Total		**Marble Falls**	**2,738**	**2,738**	**2,738**	**2,738**	**2,738**	**2,738**	**2,738**
Saratoga UWCD*	Lampasas	Marble Falls	2,839	2,839	2,839	2,839	2,839	2,839	2,839
Saratoga UWCD Total		**Marble Falls**	**2,839**	**2,839**	**2,839**	**2,839**	**2,839**	**2,839**	**2,839**
No District	Brown	Marble Falls	25	25	25	25	25	25	25
No District	Mills	Marble Falls	25	25	25	25	25	25	25
No District Total		**Marble Falls**	**50**	**50**	**50**	**50**	**50**	**50**	**50**
GMA 8 Total		**Marble Falls**	**5,627**	**5,627**	**5,627**	**5,627**	**5,627**	**5,627**	**5,627**

*UWCD: Underground Water Conservation District.

TABLE 15. MODELED AVAILABLE GROUNDWATER FOR ELLENBURGER-SAN SABA AQUIFER IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Central Texas GCD	Burnet	Ellenburger-San Saba	10,835	10,835	10,835	10,835	10,835	10,835	10,835
Central Texas GCD Total		**Ellenburger-San Saba**	**10,835**	**10,835**	**10,835**	**10,835**	**10,835**	**10,835**	**10,835**
Saratoga UWCD*	Lampasas	Ellenburger-San Saba	2,595	2,595	2,595	2,595	2,595	2,595	2,595
Saratoga UWCD Total		**Ellenburger-San Saba**	**2,595**	**2,595**	**2,595**	**2,595**	**2,595**	**2,595**	**2,595**
No District	Brown	Ellenburger-San Saba	131	131	131	131	131	131	131
No District	Mills	Ellenburger-San Saba	499	499	499	499	499	499	499
No District Total		**Ellenburger-San Saba**	**630**	**630**	**630**	**630**	**630**	**630**	**630**
GMA 8 Total		**Ellenburger-San Saba**	**14,060**	**14,060**	**14,060**	**14,060**	**14,060**	**14,060**	**14,060**

*UWCD: Underground Water Conservation District.

TABLE 16. MODELED AVAILABLE GROUNDWATER FOR THE HICKORY AQUIFER IN GROUNDWATER MANAGEMENT AREA (GMA) 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Central Texas GCD	Burnet	Hickory	3,415	3,415	3,415	3,415	3,415	3,415	3,415
Central Texas GCD Total		**Hickory**	**3,415**	**3,415**	**3,415**	**3,415**	**3,415**	**3,415**	**3,415**
Saratoga UWCD*	Lampasas	Hickory	113	113	113	113	113	113	113
Saratoga UWCD Total		**Hickory**	**113**	**113**	**113**	**113**	**113**	**113**	**113**
No District	Brown	Hickory	12	12	12	12	12	12	12
No District	Mills	Hickory	36	36	36	36	36	36	36
No District Total		**Hickory**	**48**	**48**	**48**	**48**	**48**	**48**	**48**
GMA 8 Total		**Hickory**	**3,576**	**3,576**	**3,576**	**3,576**	**3,576**	**3,576**	**3,576**

*UWCD: Underground Water Conservation District.

TABLE 17. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (PALUXY) IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Counties Not in Upper Trinity GCD									
Bell	G	Brazos	Paluxy	0	0	0	0	0	0
Bosque	G	Brazos	Paluxy	357	357	357	357	357	357
Collin	C	Sabine	Paluxy	0	0	0	0	0	0
Collin	C	Trinity	Paluxy	1,548	1,548	1,548	1,548	1,548	1,548
Coryell	G	Brazos	Paluxy	0	0	0	0	0	0
Dallas	C	Trinity	Paluxy	359	359	359	359	359	359
Delta	D	Sulphur	Paluxy	56	56	56	56	56	56
Denton	C	Trinity	Paluxy	4,823	4,823	4,823	4,823	4,823	4,823
Ellis	C	Trinity	Paluxy	442	442	442	442	442	442
Erath	G	Brazos	Paluxy	61	61	61	61	61	61
Falls	G	Brazos	Paluxy	0	0	0	0	0	0
Fannin	C	Sulphur	Paluxy	2,088	2,088	2,088	2,088	2,088	2,088
Fannin	C	Trinity	Paluxy	0	0	0	0	0	0
Grayson	C	Trinity	Paluxy	0	0	0	0	0	0
Hamilton	G	Brazos	Paluxy	0	0	0	0	0	0
Hill	G	Brazos	Paluxy	347	347	347	347	347	347
Hill	G	Trinity	Paluxy	5	5	5	5	5	5
Hunt	D	Sabine	Paluxy	0	0	0	0	0	0
Hunt	D	Sulphur	Paluxy	3	3	3	3	3	3
Hunt	D	Trinity	Paluxy	0	0	0	0	0	0
Johnson	G	Brazos	Paluxy	878	878	878	878	878	878
Johnson	G	Trinity	Paluxy	1,563	1,563	1,563	1,563	1,563	1,563
Kaufman	C	Trinity	Paluxy	0	0	0	0	0	0
Lamar	D	Red	Paluxy	0	0	0	0	0	0
Lamar	D	Sulphur	Paluxy	8	8	8	8	8	8
Limestone	G	Brazos	Paluxy	0	0	0	0	0	0
Limestone	G	Trinity	Paluxy	0	0	0	0	0	0
McLennan	G	Brazos	Paluxy	0	0	0	0	0	0
Mills	K	Brazos	Paluxy	6	6	6	6	6	6
Mills	K	Colorado	Paluxy	0	0	0	0	0	0
Navarro	C	Trinity	Paluxy	0	0	0	0	0	0
Red River	D	Red	Paluxy	52	52	52	52	52	52
Red River	D	Sulphur	Paluxy	125	125	125	125	125	125
Rockwall	C	Trinity	Paluxy	0	0	0	0	0	0
Somervell	G	Brazos	Paluxy	14	14	14	14	14	14
Tarrant	C	Trinity	Paluxy	8,963	8,963	8,963	8,963	8,963	8,963
Subtotal			**Paluxy**	**21,698**	**21,698**	**21,698**	**21,698**	**21,698**	**21,698**

TABLE 17 (CONT). MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (PALUXY) IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Counties in Upper Trinity GCD									
Hood	G	Brazos	Paluxy (outcrop)	159	159	159	159	159	159
Hood	G	Trinity	Paluxy (outcrop)	0	0	0	0	0	0
Parker	C	Brazos	Paluxy (outcrop)	34	34	34	34	34	34
Parker	C	Trinity	Paluxy (outcrop)	2,575	2,575	2,575	2,575	2,575	2,575
Parker	C	Trinity	Paluxy (downdip)	50	50	50	50	50	50
Subtotal			**Paluxy**	**2,818**	**2,818**	**2,818**	**2,818**	**2,818**	**2,818**
GMA 8 Total			**Paluxy**	**24,516**	**24,516**	**24,516**	**24,516**	**24,516**	**24,516**

TABLE 18. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (GLEN ROSE) IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Counties Not in Upper Trinity GCD									
Bell	G	Brazos	Glen Rose	275	275	275	275	275	275
Bosque	G	Brazos	Glen Rose	729	729	729	729	729	729
Brown	F	Colorado	Glen Rose	0	0	0	0	0	0
Burnet	K	Brazos	Glen Rose	66	66	66	66	66	66
Burnet	K	Colorado	Glen Rose	82	82	82	82	82	82
Collin	C	Sabine	Glen Rose	0	0	0	0	0	0
Collin	C	Trinity	Glen Rose	83	83	83	83	83	83
Comanche	G	Brazos	Glen Rose	22	22	22	22	22	22
Comanche	G	Colorado	Glen Rose	18	18	18	18	18	18
Coryell	G	Brazos	Glen Rose	120	120	120	120	120	120
Dallas	C	Trinity	Glen Rose	131	131	131	131	131	131
Delta	D	Sulphur	Glen Rose	0	0	0	0	0	0
Denton	C	Trinity	Glen Rose	339	339	339	339	339	339
Ellis	C	Trinity	Glen Rose	50	50	50	50	50	50
Erath	G	Brazos	Glen Rose	1,078	1,078	1,078	1,078	1,078	1,078
Falls	G	Brazos	Glen Rose	0	0	0	0	0	0
Fannin	C	Sulphur	Glen Rose	0	0	0	0	0	0
Fannin	C	Trinity	Glen Rose	0	0	0	0	0	0
Grayson	C	Trinity	Glen Rose	0	0	0	0	0	0
Hamilton	G	Brazos	Glen Rose	218	218	218	218	218	218
Hill	G	Brazos	Glen Rose	114	114	114	114	114	114
Hill	G	Trinity	Glen Rose	1	1	1	1	1	1
Hunt	D	Sabine	Glen Rose	0	0	0	0	0	0
Hunt	D	Sulphur	Glen Rose	0	0	0	0	0	0
Hunt	D	Trinity	Glen Rose	0	0	0	0	0	0
Johnson	G	Brazos	Glen Rose	951	951	951	951	951	951
Johnson	G	Trinity	Glen Rose	682	682	682	682	682	682
Kaufman	C	Trinity	Glen Rose	0	0	0	0	0	0
Lamar	D	Red	Glen Rose	0	0	0	0	0	0
Lamar	D	Sulphur	Glen Rose	0	0	0	0	0	0
Lampasas	G	Brazos	Glen Rose	68	68	68	68	68	68
Limestone	G	Brazos	Glen Rose	0	0	0	0	0	0
Limestone	G	Trinity	Glen Rose	0	0	0	0	0	0
McLennan	G	Brazos	Glen Rose	0	0	0	0	0	0
Milam	G	Brazos	Glen Rose	0	0	0	0	0	0
Mills	K	Brazos	Glen Rose	96	96	96	96	96	96
Mills	K	Colorado	Glen Rose	93	93	93	93	93	93
Navarro	C	Trinity	Glen Rose	0	0	0	0	0	0
Red River	D	Red	Glen Rose	0	0	0	0	0	0

TABLE 18 (CONT). MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (GLEN ROSE) IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Red River	D	Sulphur	Glen Rose	0	0	0	0	0	0
Rockwall	C	Trinity	Glen Rose	0	0	0	0	0	0
Somervell	G	Brazos	Glen Rose	146	146	146	146	146	146
Tarrant	C	Trinity	Glen Rose	793	793	793	793	793	793
Travis	K	Brazos	Glen Rose	0	0	0	0	0	0
Travis	K	Colorado	Glen Rose	100	100	100	100	100	100
Williamson	G	Brazos	Glen Rose	135	135	135	135	135	135
Williamson	G	Colorado	Glen Rose	0	0	0	0	0	0
Williamson	K	Brazos	Glen Rose	0	0	0	0	0	0
Williamson	K	Colorado	Glen Rose	15	15	15	15	15	15
Subtotal			**Glen Rose**	**6,405**	**6,405**	**6,405**	**6,405**	**6,405**	**6,405**
Counties in Upper Trinity GCD									
Hood	G	Brazos	Glen Rose (outcrop)	790	790	790	790	790	790
Hood	G	Brazos	Glen Rose (downdip)	100	100	100	100	100	100
Hood	G	Trinity	Glen Rose (downdip)	24	24	24	24	24	24
Parker	C	Brazos	Glen Rose (outcrop)	140	140	140	140	140	140
Parker	C	Brazos	Glen Rose (downdip)	11	11	11	11	11	11
Parker	C	Trinity	Glen Rose (outcrop)	3,545	3,545	3,545	3,545	3,545	3,545
Parker	C	Trinity	Glen Rose (downdip)	1,395	1,395	1,395	1,395	1,395	1,395
Subtotal			**Glen Rose**	**6,005**	**6,005**	**6,005**	**6,005**	**6,005**	**6,005**
GMA 8 Total			**Glen Rose**	**12,410**	**12,410**	**12,410**	**12,410**	**12,410**	**12,410**

TABLE 19. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (TWIN MOUNTAINS) IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2020	2030	2040	2050	2060	2070
Counties Not in Upper Trinity GCD									
Collin	C	Sabine	Twin Mountains	0	0	0	0	0	0
Collin	C	Trinity	Twin Mountains	2,202	2,202	2,202	2,202	2,202	2,202
Dallas	C	Trinity	Twin Mountains	3,201	3,201	3,201	3,201	3,201	3,201
Denton	C	Trinity	Twin Mountains	8,372	8,372	8,372	8,372	8,372	8,372
Ellis	C	Trinity	Twin Mountains	0	0	0	0	0	0
Erath	G	Brazos	Twin Mountains	5,017	5,017	5,017	5,017	5,017	5,017
Fannin	C	Sulphur	Twin Mountains	0	0	0	0	0	0
Fannin	C	Trinity	Twin Mountains	0	0	0	0	0	0
Grayson	C	Trinity	Twin Mountains	0	0	0	0	0	0
Hunt	D	Sabine	Twin Mountains	0	0	0	0	0	0
Hunt	D	Trinity	Twin Mountains	0	0	0	0	0	0
Johnson	G	Brazos	Twin Mountains	127	127	127	127	127	127
Johnson	G	Trinity	Twin Mountains	152	152	152	152	152	152
Kaufman	C	Trinity	Twin Mountains	0	0	0	0	0	0
Rockwall	C	Trinity	Twin Mountains	0	0	0	0	0	0
Somervell	G	Brazos	Twin Mountains	65	65	65	65	65	65
Tarrant	C	Trinity	Twin Mountains	6,922	6,922	6,922	6,922	6,922	6,922
Subtotal			**Twin Mountains**	**26,058**	**26,058**	**26,058**	**26,058**	**26,058**	**26,058**

TABLE 19 (CONT). MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (TWIN MOUNTAINS) IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2020	2030	2040	2050	2060	2070
Counties in Upper Trinity GCD									
Hood	G	Brazos	Twin Mountains (outcrop)	5,024	5,024	5,024	5,024	5,024	5,024
Hood	G	Brazos	Twin Mountains (downdip)	10,594	10,594	10,594	10,594	10,594	10,594
Hood	G	Trinity	Twin Mountains (downdip)	26	26	26	26	26	26
Parker	C	Brazos	Twin Mountains (outcrop)	1,282	1,282	1,282	1,282	1,282	1,282
Parker	C	Brazos	Twin Mountains (downdip)	942	942	942	942	942	942
Parker	C	Trinity	Twin Mountains (downdip)	1,586	1,586	1,586	1,586	1,586	1,586
Subtotal			**Twin Mountains**	**19,454**	**19,454**	**19,454**	**19,454**	**19,454**	**19,454**
GMA 8 Total			**Twin Mountains**	**45,512**	**45,512**	**45,512**	**45,512**	**45,512**	**45,512**

TABLE 20. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (TRAVIS PEAK) IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Counties Not in Upper Trinity GCD									
Bell	G	Brazos	Travis Peak	9,000	9,000	9,000	9,000	9,000	9,000
Bosque	G	Brazos	Travis Peak	7,683	7,683	7,683	7,683	7,683	7,683
Brown	F	Brazos	Travis Peak	3	3	3	3	3	3
Brown	F	Colorado	Travis Peak	381	381	381	381	381	381
Burnet	K	Brazos	Travis Peak	3,297	3,297	3,297	3,297	3,297	3,297
Burnet	K	Colorado	Travis Peak	445	445	445	445	445	445
Comanche	G	Brazos	Travis Peak	6,115	6,115	6,115	6,115	6,115	6,115
Comanche	G	Colorado	Travis Peak	49	49	49	49	49	49
Coryell	G	Brazos	Travis Peak	4,374	4,374	4,374	4,374	4,374	4,374
Dallas	C	Trinity	Travis Peak	0	0	0	0	0	0
Delta	D	Sulphur	Travis Peak	0	0	0	0	0	0
Ellis	C	Trinity	Travis Peak	5,676	5,676	5,676	5,676	5,676	5,676
Erath	G	Brazos	Travis Peak	11,824	11,824	11,824	11,824	11,824	11,824
Falls	G	Brazos	Travis Peak	1,435	1,435	1,435	1,435	1,435	1,435
Fannin	C	Sulphur	Travis Peak	0	0	0	0	0	0
Fannin	C	Trinity	Travis Peak	0	0	0	0	0	0
Hamilton	G	Brazos	Travis Peak	2,209	2,209	2,209	2,209	2,209	2,209
Hill	G	Brazos	Travis Peak	4,404	4,404	4,404	4,404	4,404	4,404
Hill	G	Trinity	Travis Peak	281	281	281	281	281	281
Hunt	D	Sabine	Travis Peak	0	0	0	0	0	0
Hunt	D	Sulphur	Travis Peak	0	0	0	0	0	0
Hunt	D	Trinity	Travis Peak	0	0	0	0	0	0

TABLE 20 (CONT). MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (TRAVIS PEAK) IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Johnson	G	Brazos	Travis Peak	1,581	1,581	1,581	1,581	1,581	1,581
Johnson	G	Trinity	Travis Peak	2,891	2,891	2,891	2,891	2,891	2,891
Kaufman	C	Trinity	Travis Peak	0	0	0	0	0	0
Lamar	D	Red	Travis Peak	0	0	0	0	0	0
Lamar	D	Sulphur	Travis Peak	0	0	0	0	0	0
Lampasas	G	Brazos	Travis Peak	1,525	1,525	1,525	1,525	1,525	1,525
Lampasas	G	Colorado	Travis Peak	68	68	68	68	68	68
Limestone	G	Brazos	Travis Peak	0	0	0	0	0	0
Limestone	G	Trinity	Travis Peak	0	0	0	0	0	0
McLennan	G	Brazos	Travis Peak	20,649	20,649	20,649	20,649	20,649	20,649
Milam	G	Brazos	Travis Peak	0	0	0	0	0	0
Mills	K	Brazos	Travis Peak	704	704	704	704	704	704
Mills	K	Colorado	Travis Peak	1,560	1,560	1,560	1,560	1,560	1,560
Navarro	C	Trinity	Travis Peak	0	0	0	0	0	0
Red River	D	Red	Travis Peak	0	0	0	0	0	0
Red River	D	Sulphur	Travis Peak	0	0	0	0	0	0
Somervell	G	Brazos	Travis Peak	1,763	1,763	1,763	1,763	1,763	1,763
Travis	K	Brazos	Travis Peak	1	1	1	1	1	1
Travis	K	Colorado	Travis Peak	6,642	6,642	6,642	6,642	6,642	6,642
Williamson	G	Brazos	Travis Peak	3,543	3,543	3,543	3,543	3,543	3,543
Williamson	G	Colorado	Travis Peak	5	5	5	5	5	5
Williamson	K	Brazos	Travis Peak	0	0	0	0	0	0

TABLE 20 (CONT). MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (TRAVIS PEAK) IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Williamson	K	Colorado	Travis Peak	0	0	0	0	0	0
Subtotal			**Travis Peak**	**98,108**	**98,108**	**98,108**	**98,108**	**98,108**	**98,108**
Counties in Upper Trinity GCD[1]									
Hood	G	Brazos	Travis Peak	122	122	122	122	122	122
Subtotal			**Travis Peak**	**122**	**122**	**122**	**122**	**122**	**122**
GMA 8 Total			**Travis Peak**	**98,230**	**98,230**	**98,230**	**98,230**	**98,230**	**98,230**

[1]Splits for Upper Trinity GCD are presented since they are included in the GMA 8-wide desired future conditions.

TABLE 21. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (HENSELL) IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Counties Not in Upper Trinity GCD[1]									
Bell	G	Brazos	Hensell	1,100	1,100	1,100	1,100	1,100	1,100
Bosque	G	Brazos	Hensell	3,837	3,837	3,837	3,837	3,837	3,837
Brown	F	Colorado	Hensell	4	4	4	4	4	4
Burnet	K	Brazos	Hensell	2,477	2,477	2,477	2,477	2,477	2,477
Burnet	K	Colorado	Hensell	186	186	186	186	186	186
Comanche	G	Brazos	Hensell	180	180	180	180	180	180
Comanche	G	Colorado	Hensell	24	24	24	24	24	24
Coryell	G	Brazos	Hensell	2,197	2,197	2,197	2,197	2,197	2,197
Dallas	C	Trinity	Hensell	0	0	0	0	0	0
Ellis	C	Trinity	Hensell	0	0	0	0	0	0
Erath	G	Brazos	Hensell	5,141	5,141	5,141	5,141	5,141	5,141
Falls	G	Brazos	Hensell	0	0	0	0	0	0
Hamilton	G	Brazos	Hensell	1,672	1,672	1,672	1,672	1,672	1,672
Hill	G	Brazos	Hensell	25	25	25	25	25	25
Hill	G	Trinity	Hensell	0	0	0	0	0	0
Johnson	G	Brazos	Hensell	68	68	68	68	68	68
Johnson	G	Trinity	Hensell	51	51	51	51	51	51
Kaufman	C	Trinity	Hensell	0	0	0	0	0	0
Lampasas	G	Brazos	Hensell	712	712	712	712	712	712
Lampasas	G	Colorado	Hensell	1	1	1	1	1	1
Limestone	G	Brazos	Hensell	0	0	0	0	0	0
Limestone	G	Trinity	Hensell	0	0	0	0	0	0
McLennan	G	Brazos	Hensell	4,701	4,701	4,701	4,701	4,701	4,701
Milam	G	Brazos	Hensell	0	0	0	0	0	0
Mills	K	Brazos	Hensell	172	172	172	172	172	172
Mills	K	Colorado	Hensell	435	435	435	435	435	435
Navarro	C	Trinity	Hensell	0	0	0	0	0	0
Somervell	G	Brazos	Hensell	217	217	217	217	217	217
Travis	K	Brazos	Hensell	1	1	1	1	1	1
Travis	K	Colorado	Hensell	2,268	2,268	2,268	2,268	2,268	2,268
Williamson	G	Brazos	Hensell	1,599	1,599	1,599	1,599	1,599	1,599
Williamson	G	Colorado	Hensell	0	0	0	0	0	0
Williamson	K	Brazos	Hensell	0	0	0	0	0	0
Williamson	K	Colorado	Hensell	0	0	0	0	0	0
Subtotal			**Hensell**	**27,068**	**27,068**	**27,068**	**27,068**	**27,068**	**27,068**

TABLE 21 (CONT). MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (HENSELL) IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Counties in Upper Trinity GCD[1]									
Hood	G	Brazos	Hensell	50	50	50	50	50	50
Subtotal			**Hensell**	**50**	**50**	**50**	**50**	**50**	**50**
GMA 8 Total			**Hensell**	**27,118**	**27,118**	**27,118**	**27,118**	**27,118**	**27,118**

[1]Splits for Upper Trinity GCD are presented since they are included in the GMA 8-wide desired future conditions.
*Note that the Hensell values in this table represent a portion of the total Travis Peak values already provided in Table 20 and do not represent an additional source of water.

TABLE 22. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (HOSSTON) IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Counties Not in Upper Trinity GCD[1]									
Bell	G	Brazos	Hosston	7,900	7,900	7,900	7,900	7,900	7,900
Bosque	G	Brazos	Hosston	3,765	3,765	3,765	3,765	3,765	3,765
Brown	F	Brazos	Hosston	3	3	3	3	3	3
Brown	F	Colorado	Hosston	343	343	343	343	343	343
Burnet	K	Brazos	Hosston	659	659	659	659	659	659
Burnet	K	Colorado	Hosston	224	224	224	224	224	224
Comanche	G	Brazos	Hosston	5,863	5,863	5,863	5,863	5,863	5,863
Comanche	G	Colorado	Hosston	6	6	6	6	6	6
Coryell	G	Brazos	Hosston	2,163	2,163	2,163	2,163	2,163	2,163
Dallas	C	Trinity	Hosston	0	0	0	0	0	0
Ellis	C	Trinity	Hosston	5,545	5,545	5,545	5,545	5,545	5,545
Erath	G	Brazos	Hosston	6,387	6,387	6,387	6,387	6,387	6,387
Falls	G	Brazos	Hosston	1,435	1,435	1,435	1,435	1,435	1,435
Hamilton	G	Brazos	Hosston	385	385	385	385	385	385
Hill	G	Brazos	Hosston	3,330	3,330	3,330	3,330	3,330	3,330
Hill	G	Trinity	Hosston	280	280	280	280	280	280
Johnson	G	Brazos	Hosston	1,442	1,442	1,442	1,442	1,442	1,442
Johnson	G	Trinity	Hosston	2,809	2,809	2,809	2,809	2,809	2,809
Kaufman	C	Trinity	Hosston	0	0	0	0	0	0
Lampasas	G	Brazos	Hosston	785	785	785	785	785	785
Lampasas	G	Colorado	Hosston	65	65	65	65	65	65
Limestone	G	Brazos	Hosston	0	0	0	0	0	0
Limestone	G	Trinity	Hosston	0	0	0	0	0	0
McLennan	G	Brazos	Hosston	15,948	15,948	15,948	15,948	15,948	15,948
Milam	G	Brazos	Hosston	0	0	0	0	0	0
Mills	K	Brazos	Hosston	375	375	375	375	375	375
Mills	K	Colorado	Hosston	1,081	1,081	1,081	1,081	1,081	1,081

TABLE 22 (CONT). MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (HOSSTON) IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Navarro	C	Trinity	Hosston	0	0	0	0	0	0
Somervell	G	Brazos	Hosston	930	930	930	930	930	930
Travis	K	Brazos	Hosston	0	0	0	0	0	0
Travis	K	Colorado	Hosston	4,185	4,185	4,185	4,185	4,185	4,185
Williamson	G	Brazos	Hosston	1,746	1,746	1,746	1,746	1,746	1,746
Williamson	G	Colorado	Hosston	5	5	5	5	5	5
Williamson	K	Brazos	Hosston	0	0	0	0	0	0
Williamson	K	Colorado	Hosston	0	0	0	0	0	0
Subtotal			**Hosston**	**67,659**	**67,659**	**67,659**	**67,659**	**67,659**	**67,659**
Counties in Upper Trinity GCD[1]									
Hood	G	Brazos	Hosston	72	72	72	72	72	72
Subtotal			**Hosston**	**72**	**72**	**72**	**72**	**72**	**72**
GMA 8 Total			**Hosston**	**67,731**	**67,731**	**67,731**	**67,731**	**67,731**	**67,731**

[1]Splits for Upper Trinity GCD are presented since they are included in the GMA 8-wide desired future conditions.
*Note that the Hosston values in this table represent a portion of the total Travis Peak values already provided in Table 20 and do not represent an additional source of water.

TABLE 23. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (ANTLERS) IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Counties Not in Upper Trinity GCD									
Brown	F	Brazos	Antlers	48	48	48	48	48	48
Brown	F	Colorado	Antlers	995	995	995	995	995	995
Callahan	G	Brazos	Antlers	443	443	443	443	443	443
Callahan	G	Colorado	Antlers	1,283	1,283	1,283	1,283	1,283	1,283
Collin	C	Trinity	Antlers	1,962	1,962	1,962	1,962	1,962	1,962
Comanche	G	Brazos	Antlers	5,843	5,843	5,843	5,843	5,843	5,843
Cooke	C	Red	Antlers	2,186	2,186	2,186	2,186	2,186	2,186
Cooke	C	Trinity	Antlers	8,335	8,335	8,335	8,335	8,335	8,335
Denton	C	Trinity	Antlers	16,557	16,557	16,557	16,557	16,557	16,557
Eastland	G	Brazos	Antlers	5,184	5,184	5,184	5,184	5,184	5,184
Eastland	G	Colorado	Antlers	552	552	552	552	552	552
Erath	G	Brazos	Antlers	2,627	2,627	2,627	2,627	2,627	2,627
Fannin	C	Red	Antlers	0	0	0	0	0	0
Fannin	C	Sulphur	Antlers	0	0	0	0	0	0
Fannin	C	Trinity	Antlers	0	0	0	0	0	0
Grayson	C	Red	Antlers	6,665	6,665	6,665	6,665	6,665	6,665
Grayson	C	Trinity	Antlers	4,051	4,051	4,051	4,051	4,051	4,051
Lamar	D	Red	Antlers	0	0	0	0	0	0
Lamar	D	Sulphur	Antlers	0	0	0	0	0	0
Red River	D	Red	Antlers	0	0	0	0	0	0
Tarrant	C	Trinity	Antlers	1,248	1,248	1,248	1,248	1,248	1,248
Taylor	G	Brazos	Antlers	5	5	5	5	5	5
Taylor	G	Colorado	Antlers	9	9	9	9	9	9
Subtotal			**Antlers**	**57,993**	**57,993**	**57,993**	**57,993**	**57,993**	**57,993**
Counties in Upper Trinity GCD									
Montague	B	Red	Antlers (outcrop)	238	238	238	238	238	238
Montague	B	Trinity	Antlers (outcrop)	5,866	5,866	5,866	5,866	5,866	5,866
Parker	C	Brazos	Antlers (outcrop)	247	247	247	247	247	247
Parker	C	Trinity	Antlers (outcrop)	2,642	2,642	2,642	2,642	2,642	2,642
Wise	C	Trinity	Antlers (outcrop)	9,013	9,013	9,013	9,013	9,013	9,013
Wise	C	Trinity	Antlers (downdip)	2,439	2,439	2,439	2,439	2,439	2,439
Subtotal			**Antlers**	**20,445**	**20,445**	**20,445**	**20,445**	**20,445**	**20,445**
GMA 8 Total			**Antlers**	**78,438**	**78,438**	**78,438**	**78,438**	**78,438**	**78,438**

TABLE 24. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE WOODBINE AQUIFER IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Collin	C	Sabine	Woodbine	0	0	0	0	0	0
Collin	C	Trinity	Woodbine	4,254	4,254	4,254	4,254	4,254	4,254
Cooke	C	Red	Woodbine	262	262	262	262	262	262
Cooke	C	Trinity	Woodbine	539	539	539	539	539	539
Dallas	C	Trinity	Woodbine	2,798	2,798	2,798	2,798	2,798	2,798
Denton	C	Trinity	Woodbine	3,609	3,609	3,609	3,609	3,609	3,609
Ellis	C	Trinity	Woodbine	2,074	2,074	2,074	2,074	2,074	2,074
Fannin	C	Red	Woodbine	3,547	3,547	3,547	3,547	3,547	3,547
Fannin	C	Sulphur	Woodbine	550	550	550	550	550	550
Fannin	C	Trinity	Woodbine	827	827	827	827	827	827
Grayson	C	Red	Woodbine	5,603	5,603	5,603	5,603	5,603	5,603
Grayson	C	Trinity	Woodbine	1,923	1,923	1,923	1,923	1,923	1,923
Hill	G	Brazos	Woodbine	284	284	284	284	284	284
Hill	G	Trinity	Woodbine	302	302	302	302	302	302
Hunt	D	Sabine	Woodbine	268	268	268	268	268	268
Hunt	D	Sulphur	Woodbine	165	165	165	165	165	165
Hunt	D	Trinity	Woodbine	330	330	330	330	330	330
Johnson	G	Brazos	Woodbine	24	24	24	24	24	24
Johnson	G	Trinity	Woodbine	1,957	1,957	1,957	1,957	1,957	1,957
Kaufman	C	Trinity	Woodbine	0	0	0	0	0	0
Lamar	D	Red	Woodbine	0	0	0	0	0	0
Lamar	D	Sulphur	Woodbine	49	49	49	49	49	49
McLennan	G	Brazos	Woodbine	0	0	0	0	0	0
Navarro	C	Trinity	Woodbine	68	68	68	68	68	68
Red River	D	Red	Woodbine	2	2	2	2	2	2
Rockwall	C	Trinity	Woodbine	0	0	0	0	0	0
Tarrant	C	Trinity	Woodbine	1,139	1,139	1,139	1,139	1,139	1,139
GMA 8 Total			**Woodbine**	**30,574**	**30,574**	**30,574**	**30,574**	**30,574**	**30,574**

TABLE 25. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE EDWARDS (BALCONES FAULT ZONE) AQUIFER IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Bell	G	Brazos	Edwards (Balcones Fault Zone)	6,469	6,469	6,469	6,469	6,469	6,469
Travis	K	Brazos	Edwards (Balcones Fault Zone)	275	275	275	275	275	275
Travis	K	Colorado	Edwards (Balcones Fault Zone)	4,962	4,962	4,962	4,962	4,962	4,962
Williamson	G	Brazos	Edwards (Balcones Fault Zone)	3,351	3,351	3,351	3,351	3,351	3,351
Williamson	G	Colorado	Edwards (Balcones Fault Zone)	101	101	101	101	101	101
Williamson	K	Brazos	Edwards (Balcones Fault Zone)	6	6	6	6	6	6
Williamson	K	Colorado	Edwards (Balcones Fault Zone)	4	4	4	4	4	4
GMA 8 Total			Edwards (Balcones Fault Zone)	**15,168**	**15,168**	**15,168**	**15,168**	**15,168**	**15,168**

TABLE 26. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE MARBLE FALLS AQUIFER IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Brown	F	Colorado	Marble Falls	25	25	25	25	25	25
Burnet	K	Brazos	Marble Falls	1,384	1,384	1,384	1,384	1,384	1,384
Burnet	K	Colorado	Marble Falls	1,354	1,354	1,354	1,354	1,354	1,354
Lampasas	G	Brazos	Marble Falls	1,954	1,954	1,954	1,954	1,954	1,954
Lampasas	G	Colorado	Marble Falls	885	885	885	885	885	885
Mills	K	Brazos	Marble Falls	1	1	1	1	1	1
Mills	K	Colorado	Marble Falls	24	24	24	24	24	24
GMA 8 Total			**Marble Falls**	**5,627**	**5,627**	**5,627**	**5,627**	**5,627**	**5,627**

TABLE 27. MODELED AVAILABLE GROUNDWATER BY DECADE FOR ELLENBURGER-SAN SABA AQUIFER IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Brown	F	Colorado	Ellenburger-San Saba	131	131	131	131	131	131
Burnet	K	Brazos	Ellenburger-San Saba	3,825	3,825	3,825	3,825	3,825	3,825
Burnet	K	Colorado	Ellenburger-San Saba	7,010	7,010	7,010	7,010	7,010	7,010
Lampasas	G	Brazos	Ellenburger-San Saba	1,681	1,681	1,681	1,681	1,681	1,681
Lampasas	G	Colorado	Ellenburger-San Saba	914	914	914	914	914	914
Mills	K	Brazos	Ellenburger-San Saba	93	93	93	93	93	93
Mills	K	Colorado	Ellenburger-San Saba	406	406	406	406	406	406
GMA 8 Total			Ellenburger-San Saba	**14,060**	**14,060**	**14,060**	**14,060**	**14,060**	**14,060**

TABLE 28. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE HICKORY AQUIFER IN GROUNDWATER MANAGEMENT AREA (GMA) 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	Aquifer	2030	2040	2050	2060	2070	2080
Brown	F	Colorado	Hickory	12	12	12	12	12	12
Burnet	K	Brazos	Hickory	1,237	1,237	1,237	1,237	1,237	1,237
Burnet	K	Colorado	Hickory	2,178	2,178	2,178	2,178	2,178	2,178
Lampasas	G	Brazos	Hickory	79	79	79	79	79	79
Lampasas	G	Colorado	Hickory	34	34	34	34	34	34
Mills	K	Brazos	Hickory	7	7	7	7	7	7
Mills	K	Colorado	Hickory	29	29	29	29	29	29
GMA 8 Total			**Hickory**	**3,576**	**3,576**	**3,576**	**3,576**	**3,576**	**3,576**

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 2080 were based on the simulated water level values at individual model cells extracted from predictive simulation water level 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 colspan="2">Region 4</th><th colspan="2">Region 5</th></tr>
<tr><td>2</td><td colspan="4">Woodbine</td><td colspan="3">Woodbine (no sand)</td></tr>
<tr><td>3</td><td colspan="7">Washita/Fredericksburg</td></tr>
<tr><td>4</td><td rowspan="5">Antlers</td><td colspan="4">Paluxy</td><td colspan="2">Paluxy (no sand)</td></tr>
<tr><td>5</td><td colspan="6">Glen Rose</td></tr>
<tr><td>6</td><td rowspan="3">Twin Mountains</td><td colspan="2" 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, Groundwater Management Area 8 (2021) adopted a method presented by Van Kelley of INTERA, Inc., which calculated a single composite water level from multiple model cells with each adjusted by transmissivity. This composite water level took both the water level and hydraulic transmissivity at each cell into calculation, as shown in the following equation:

$$Hc = \frac{\sum_{i=UL}^{LL} T_i H_i}{\sum_{i=UL}^{LL} T_i}$$

Where:

H_C = Composite Water Level (feet above mean sea level)

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

H_i = Water Level 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.

Note that multiple model layers can represent a single aquifer or subunit, so the aquifer or subunit designation should be determined by the IBOUND value of a model cell rather than the model layer. When a model cell goes dry, the water level was set to the cell bottom. However, if an aquifer completely goes dry, TWDB assigns the bottom elevation from the lowest model cell of the aquifer to the composite water level.

The average water level 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 water level for a county (feet above mean sea level)

Hc_i = Composite Water Level 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:

$$DD\_County = Hc\_County_{2009} - Hc\_County_{2080}$$

Where:

Hc_County_{2009} = Average water level of an aquifer in a county in 2009 as defined above (feet above mean sea level)

Hc_County_{2080} = Average water level of an aquifer in a county in 2080 as defined above (feet above mean sea level).

If an aquifer went dry in 2009, that lateral location was excluded from the calculation.

In comparison with a simple average calculation based on total model cell count, use of composite water level 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 water level and drawdown calculation.

Per Groundwater Management Area 8, a desired future condition was met if the simulated drawdown was within five percent or five feet of the desired future condition. Using the water level output file submitted by Groundwater Management Area 8 and the method described above, the TWDB calculated the drawdowns and then compared with the correlated desired future conditions. The comparisons are presented in Tables A1, A2, A3, and A4. The comparison indicates that the predictive simulation meets the desired future conditions of the Trinity and Woodbine aquifers in Groundwater Management Area 8.

TABLE A1. COMPARISON BETWEEN DRAWDOWN AND DESIRED FUTURE CONDITIONS BY GROUNDWATER CONSERVATION DISTRICT (GCD), EXCLUDING UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT.

GCD	Aquifer	Desired Future Condition (feet of drawdown between January 1, 2010 and December 31, 2080)	Simulated Drawdown between Initial Water Levels and Stress Period 71 (feet)	Is Desired Future Condition Violated (Exceeded by 5 feet and 5%)?
Central Texas GCD	Woodbine	—	—	—
	Paluxy	—	—	—
	Glen Rose	2	2	No
	Twin Mountains	—	—	—
	Travis Peak	19	11	No
	Hensell	7	9	No
	Hosston	21	21	No
	Antlers	—	—	—
Clearwater UWCD	Woodbine	—	—	—
	Paluxy	17	18	No
	Glen Rose	83	83	No
	Twin Mountains	—	—	—
	Travis Peak	333	333	No
	Hensell	145	145	No
	Hosston	375	375	No
	Antlers	—	—	—
Middle Trinity GCD	Woodbine	—	—	—
	Paluxy	5	7	No
	Glen Rose	29	29	No
	Twin Mountains	8	6	No
	Travis Peak	98	98	No
	Hensell	77	77	No
	Hosston	124	124	No
	Antlers	12	12	No
North Texas GCD	Woodbine	263	263	No
	Paluxy	690	690	No
	Glen Rose	366	366	No
	Twin Mountains	601	601	No
	Travis Peak	—	—	—
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	305	296	No

TABLE A1 (CONT). COMPARISON BETWEEN DRAWDOWN AND DESIRED FUTURE CONDITIONS BY GROUNDWATER CONSERVATION DISTRICT (GCD), EXCLUDING UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT.

GCD	Aquifer	Desired Future Condition (feet of drawdown between January 1, 2010 and December 31, 2080)	Simulated Drawdown between Initial Water Levels and Stress Period 71 (feet)	Is Desired Future Condition Violated (Exceeded by 5 feet and 5%)?
Northern Trinity GCD	Woodbine	6	6	No
	Paluxy	105	105	No
	Glen Rose	163	163	No
	Twin Mountains	348	232	No
	Travis Peak	—	—	—
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	177	83	No
Post Oak Savannah GCD	Woodbine	—	—	—
	Paluxy	—	—	—
	Glen Rose	241	241	No
	Twin Mountains	—	—	—
	Travis Peak	412	412	No
	Hensell	261	261	No
	Hosston	412	412	No
	Antlers	—	—	—
Prairielands GCD	Woodbine	44	44	No
	Paluxy	44	46	No
	Glen Rose	142	142	No
	Twin Mountains	170	46	No
	Travis Peak	323	311	No
	Hensell	201	207	No
	Hosston	364	369	No
	Antlers	—	—	—
Red River GCD	Woodbine	209	211	No
	Paluxy	830	720	No
	Glen Rose	335	308	No
	Twin Mountains	405	405	No
	Travis Peak	291	291	No
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	321	321	No
Saratoga UWCD	Woodbine	—	—	—
	Paluxy	—	—	—
	Glen Rose	1	1	No
	Twin Mountains	—	—	—
	Travis Peak	6	6	No
	Hensell	1	2	No
	Hosston	11	12	No
	Antlers	—	—	—

TABLE A1 (CONT). COMPARISON BETWEEN DRAWDOWN AND DESIRED FUTURE CONDITIONS BY GROUNDWATER CONSERVATION DISTRICT (GCD), EXCLUDING UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT.

GCD	Aquifer	Desired Future Condition (feet of drawdown between January 1, 2010 and December 31, 2080)	Simulated Drawdown between Initial Water Levels and Stress Period 71 (feet)	Is Desired Future Condition Violated (Exceeded by 5 feet and 5%)?
Southern Trinity GCD	Woodbine	6	6	No
	Paluxy	41	41	No
	Glen Rose	148	148	No
	Twin Mountains	—	—	—
	Travis Peak	504	499	No
	Hensell	242	242	No
	Hosston	582	582	No
	Antlers	—	—	—

TABLE A2. COMPARISON BETWEEN DRAWDOWN AND DESIRED FUTURE CONDITIONS FOR UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT.

GCD	Portion	Aquifer	Desired Future Condition (feet of drawdown between January 1, 2010 and December 31, 2080)	Simulated Drawdown between Initial Water Levels and Stress Period 71 (feet)	Is Desired Future Condition Violated (Exceeded by 5 feet and 5%)?
Upper Trinity GCD	outcrop	Woodbine	—	—	—
		Paluxy	6	6	No
		Glen Rose	15	14	No
		Twin Mountains	10	6	No
		Travis Peak	—	—	—
		Hensell	—	—	—
		Hosston	—	—	—
		Antlers	47	16	No
Upper Trinity GCD	subcrop	Woodbine	—	—	—
		Paluxy	2	2	No
		Glen Rose	45	49	No
		Twin Mountains	70	46	No
		Travis Peak	—	—	—
		Hensell	—	—	—
		Hosston	—	—	—
		Antlers	154	92	No

TABLE A3. COMPARISON BETWEEN DRAWDOWN AND DESIRED FUTURE CONDITIONS BY COUNTY, EXCLUDING COUNTIES IN UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT.

County	Aquifer	Desired Future Condition (feet of drawdown between January 1, 2010 and December 31, 2080)	Simulated Drawdown between Initial Water Levels and Stress Period 71 (feet)	Is Desired Future Condition Violated (Exceeded by 5 feet and 5%)?
Bell	Woodbine	—	—	—
	Paluxy	17	18.46	No
	Glen Rose	83	82.74	No
	Twin Mountains	—	—	—
	Travis Peak	333	332.79	No
	Hensell	145	144.73	No
	Hosston	375	374.76	No
	Antlers	—	—	—
Bosque	Woodbine	—	—	—
	Paluxy	6	6.78	No
	Glen Rose	53	53.38	No
	Twin Mountains	—	—	—
	Travis Peak	189	188.88	No
	Hensell	139	139.01	No
	Hosston	232	232.23	No
	Antlers	—	—	—
Brown	Woodbine	—	—	—
	Paluxy	—	—	—
	Glen Rose	1	1.9	No
	Twin Mountains	—	—	—
	Travis Peak	2	1.23	No
	Hensell	1	1.14	No
	Hosston	1	1.3	No
	Antlers	2	2.56	No
Burnet	Woodbine	—	—	—
	Paluxy	—	—	—
	Glen Rose	2	2.39	No
	Twin Mountains	—	—	—
	Travis Peak	19	10.76	No
	Hensell	7	8.89	No
	Hosston	21	21.2	No
	Antlers	—	—	—
Callahan	Woodbine	—	—	—
	Paluxy	—	—	—
	Glen Rose	—	—	—
	Twin Mountains	—	—	—
	Travis Peak	—	—	—
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	1	1.38	No

TABLE A3 (CONT). COMPARISON BETWEEN DRAWDOWN AND DESIRED FUTURE CONDITIONS BY COUNTY, EXCLUDING COUNTIES IN UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT.

County	Aquifer	Desired Future Condition (feet of drawdown between January 1, 2010 and December 31, 2080)	Simulated Drawdown between Initial Water Levels and Stress Period 71 (feet)	Is Desired Future Condition Violated (Exceeded by 5 feet and 5%)?
Collin	Woodbine	482	481.88	No
	Paluxy	729	728.64	No
	Glen Rose	366	365.79	No
	Twin Mountains	560	559.87	No
	Travis Peak	—	—	—
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	596	583.45	No
Comanche	Woodbine	—	—	—
	Paluxy	—	—	—
	Glen Rose	2	1.44	No
	Twin Mountains	—	—	—
	Travis Peak	4	2.4	No
	Hensell	2	1.76	No
	Hosston	3	2.86	No
	Antlers	12	12.08	No
Cooke	Woodbine	2	2.41	No
	Paluxy	—	—	—
	Glen Rose	—	—	—
	Twin Mountains	—	—	—
	Travis Peak	—	—	—
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	191	178.36	No
Coryell	Woodbine	—	—	—
	Paluxy	5	7.5	No
	Glen Rose	15	15.37	No
	Twin Mountains	—	—	—
	Travis Peak	107	107.32	No
	Hensell	70	70.02	No
	Hosston	141	140.6	No
	Antlers	—	—	—
Dallas	Woodbine	137	137.41	No
	Paluxy	346	345.58	No
	Glen Rose	288	288.24	No
	Twin Mountains	515	515.09	No
	Travis Peak	415	414.61	No
	Hensell	362	361.55	No
	Hosston	419	418.84	No
	Antlers	—	—	—

TABLE A3 (CONT). COMPARISON BETWEEN DRAWDOWN AND DESIRED FUTURE CONDITIONS BY COUNTY, EXCLUDING COUNTIES IN UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT.

County	Aquifer	Desired Future Condition (feet of drawdown between January 1, 2010 and December 31, 2080)	Simulated Drawdown between Initial Water Levels and Stress Period 71 (feet)	Is Desired Future Condition Violated (Exceeded by 5 feet and 5%)?
Delta	Woodbine	—	—	—
	Paluxy	279	278.97	No
	Glen Rose	198	197.8	No
	Twin Mountains	—	—	—
	Travis Peak	202	202.1	No
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	—	—	—
Denton	Woodbine	22	20.37	No
	Paluxy	558	557.89	No
	Glen Rose	367	367.03	No
	Twin Mountains	752	742.97	No
	Travis Peak	—	—	—
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	416	404.5	No
Eastland	Woodbine	—	—	—
	Paluxy	—	—	—
	Glen Rose	—	—	—
	Twin Mountains	—	—	—
	Travis Peak	—	—	—
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	4	4.11	No
Ellis	Woodbine	76	76.07	No
	Paluxy	128	127.51	No
	Glen Rose	220	220.03	No
	Twin Mountains	413	413.29	No
	Travis Peak	380	380.25	No
	Hensell	290	290.49	No
	Hosston	390	390.34	No
	Antlers	—	—	—
Erath	Woodbine	—	—	—
	Paluxy	6	1.01	No
	Glen Rose	6	5.07	No
	Twin Mountains	8	6.4	No
	Travis Peak	25	20.18	No
	Hensell	12	11.45	No
	Hosston	35	35	No
	Antlers	14	13.56	No

TABLE A3 (CONT). COMPARISON BETWEEN DRAWDOWN AND DESIRED FUTURE CONDITIONS BY COUNTY, EXCLUDING COUNTIES IN UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT.

County	Aquifer	Desired Future Condition (feet of drawdown between January 1, 2010 and December 31, 2080)	Simulated Drawdown between Initial Water Levels and Stress Period 71 (feet)	Is Desired Future Condition Violated (Exceeded by 5 feet and 5%)?
Falls	Woodbine	—	—	—
	Paluxy	159	159.35	No
	Glen Rose	238	238.09	No
	Twin Mountains	—	—	—
	Travis Peak	505	504.77	No
	Hensell	296	296.31	No
	Hosston	511	511.14	No
	Antlers	—	—	—
Fannin	Woodbine	259	259.23	No
	Paluxy	709	708.85	No
	Glen Rose	305	305.1	No
	Twin Mountains	400	400.17	No
	Travis Peak	291	291.45	No
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	269	268.98	No
Grayson	Woodbine	163	162.86	No
	Paluxy	943	942.74	No
	Glen Rose	364	363.85	No
	Twin Mountains	445	445.2	No
	Travis Peak	—	—	—
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	364	363	No
Hamilton	Woodbine	—	—	—
	Paluxy	2	2.77	No
	Glen Rose	4	4.25	No
	Twin Mountains	—	—	—
	Travis Peak	26	25.93	No
	Hensell	14	13.99	No
	Hosston	38	38.2	No
	Antlers	—	—	—
Hill	Woodbine	20	19.71	No
	Paluxy	45	44.9	No
	Glen Rose	149	148.93	No
	Twin Mountains	—	—	—
	Travis Peak	365	364.39	No
	Hensell	211	211.07	No
	Hosston	413	412.6	No
	Antlers	—	—	—

TABLE A3 (CONT). COMPARISON BETWEEN DRAWDOWN AND DESIRED FUTURE CONDITIONS BY COUNTY, EXCLUDING COUNTIES IN UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT.

County	Aquifer	Desired Future Condition (feet of drawdown between January 1, 2010 and December 31, 2080)	Simulated Drawdown between Initial Water Levels and Stress Period 71 (feet)	Is Desired Future Condition Violated (Exceeded by 5 feet and 5%)?
Hunt	Woodbine	631	630.96	No
	Paluxy	610	610.15	No
	Glen Rose	326	326.15	No
	Twin Mountains	399	398.85	No
	Travis Peak	350	349.84	No
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	—	—	—
Johnson	Woodbine	4	3.55	No
	Paluxy	-57	-57.56	No
	Glen Rose	66	65.87	No
	Twin Mountains	184	33.24	No
	Travis Peak	235	178.04	No
	Hensell	120	120.41	No
	Hosston	329	329.41	No
	Antlers	—	—	—
Kaufman	Woodbine	242	241.7	No
	Paluxy	311	311.43	No
	Glen Rose	305	304.98	No
	Twin Mountains	427	427	No
	Travis Peak	372	371.84	No
	Hensell	349	348.53	No
	Hosston	345	344.74	No
	Antlers	—	—	—
Lamar	Woodbine	42	42.07	No
	Paluxy	100	100.09	No
	Glen Rose	107	106.9	No
	Twin Mountains	—	—	—
	Travis Peak	125	124.5	No
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	132	132.31	No
Lampasas	Woodbine	—	—	—
	Paluxy	—	—	—
	Glen Rose	1	1.22	No
	Twin Mountains	—	—	—
	Travis Peak	6	6.31	No
	Hensell	1	1.56	No
	Hosston	11	11.64	No
	Antlers	—	—	—

TABLE A3 (CONT). COMPARISON BETWEEN DRAWDOWN AND DESIRED FUTURE CONDITIONS BY COUNTY, EXCLUDING COUNTIES IN UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT.

County	Aquifer	Desired Future Condition (feet of drawdown between January 1, 2010 and December 31, 2080)	Simulated Drawdown between Initial Water Levels and Stress Period 71 (feet)	Is Desired Future Condition Violated (Exceeded by 5 feet and 5%)?
Limestone	Woodbine	—	—	—
	Paluxy	199	198.7	No
	Glen Rose	301	300.8	No
	Twin Mountains	—	—	—
	Travis Peak	433	433.11	No
	Hensell	214	214.2	No
	Hosston	445	444.63	No
	Antlers	—	—	—
McLennan	Woodbine	6	6.49	No
	Paluxy	41	41.02	No
	Glen Rose	148	147.65	No
	Twin Mountains	—	—	—
	Travis Peak	504	498.88	No
	Hensell	242	242.36	No
	Hosston	582	581.81	No
	Antlers	—	—	—
Milam	Woodbine	—	—	—
	Paluxy	—	—	—
	Glen Rose	241	240.72	No
	Twin Mountains	—	—	—
	Travis Peak	412	411.52	No
	Hensell	261	260.7	No
	Hosston	412	412.3	No
	Antlers	—	—	—
Mills	Woodbine	—	—	—
	Paluxy	1	0.64	No
	Glen Rose	1	1.2	No
	Twin Mountains	—	—	—
	Travis Peak	9	7.36	No
	Hensell	2	2.16	No
	Hosston	13	13.67	No
	Antlers	—	—	—
Navarro	Woodbine	110	110.34	No
	Paluxy	139	139.22	No
	Glen Rose	266	265.96	No
	Twin Mountains	—	—	—
	Travis Peak	343	343.14	No
	Hensell	295	295.18	No
	Hosston	343	343.41	No
	Antlers	—	—	—

TABLE A3 (CONT). COMPARISON BETWEEN DRAWDOWN AND DESIRED FUTURE CONDITIONS BY COUNTY, EXCLUDING COUNTIES IN UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT.

County	Aquifer	Desired Future Condition (feet of drawdown between January 1, 2010 and December 31, 2080)	Simulated Drawdown between Initial Water Levels and Stress Period 71 (feet)	Is Desired Future Condition Violated (Exceeded by 5 feet and 5%)?
Red River	Woodbine	2	2.28	No
	Paluxy	24	23.74	No
	Glen Rose	40	39.58	No
	Twin Mountains	—	—	—
	Travis Peak	57	56.88	No
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	15	14.51	No
Rockwall	Woodbine	275	274.86	No
	Paluxy	433	432.69	No
	Glen Rose	343	342.57	No
	Twin Mountains	466	466.49	No
	Travis Peak	—	—	—
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	—	—	—
Somervell	Woodbine	—	—	—
	Paluxy	4	1.62	No
	Glen Rose	4	4.45	No
	Twin Mountains	50	50.27	No
	Travis Peak	64	64.26	No
	Hensell	17	16.57	No
	Hosston	120	120.22	No
	Antlers	—	—	—
Tarrant	Woodbine	6	6.41	No
	Paluxy	105	105.14	No
	Glen Rose	163	163.16	No
	Twin Mountains	348	231.93	No
	Travis Peak	—	—	—
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	177	83.43	No
Taylor	Woodbine	—	—	—
	Paluxy	—	—	—
	Glen Rose	—	—	—
	Twin Mountains	—	—	—
	Travis Peak	—	—	—
	Hensell	—	—	—
	Hosston	—	—	—
	Antlers	0	0.26	No

TABLE A3 (CONT). COMPARISON BETWEEN DRAWDOWN AND DESIRED FUTURE CONDITIONS BY COUNTY, EXCLUDING COUNTIES IN UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT.

County	Aquifer	Desired Future Condition (feet of drawdown between January 1, 2010 and December 31, 2080)	Simulated Drawdown between Initial Water Levels and Stress Period 71 (feet)	Is Desired Future Condition Violated (Exceeded by 5 feet and 5%)?
Travis	Woodbine	—	—	—
	Paluxy	—	—	—
	Glen Rose	90	89.73	No
	Twin Mountains	—	—	—
	Travis Peak	219	215.69	No
	Hensell	68	69.19	No
	Hosston	226	224.15	No
	Antlers	—	—	—
Williamson	Woodbine	—	—	—
	Paluxy	—	—	—
	Glen Rose	78	79.23	No
	Twin Mountains	—	—	—
	Travis Peak	220	220.43	No
	Hensell	89	90.6	No
	Hosston	225	225.78	No
	Antlers	—	—	—

TABLE A4. COMPARISON BETWEEN DRAWDOWN AND DESIRED FUTURE CONDITIONS BY COUNTY IN UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT.

County	Portion	Aquifer	Desired Future Condition (feet of drawdown between January 1, 2010 and December 31, 2080)	Simulated Drawdown between Initial Water Levels and Stress Period 71 (feet)	Is Desired Future Condition Violated (Exceeded by 5 feet and 5%)?
Hood	outcrop	Antlers	—	—	—
		Paluxy	6	5.68	No
		Glen Rose	9	9.41	No
		Twin Mountains	13	8.14	No
	subcrop	Antlers	—	—	—
		Paluxy	—	—	—
		Glen Rose	39	39.41	No
		Twin Mountains	72	20.57	No
Montague	outcrop	Antlers	40	20.37	No
		Paluxy	—	—	—
		Glen Rose	—	—	—
		Twin Mountains	—	—	—
	subcrop	Antlers	—	—	—
		Paluxy	—	—	—
		Glen Rose	—	—	—
		Twin Mountains	—	—	—
Parker	outcrop	Antlers	42	8.76	No
		Paluxy	6	5.69	No
		Glen Rose	20	20.06	No
		Twin Mountains	7	2.42	No
	subcrop	Antlers	—	—	—
		Paluxy	2	1.81	No
		Glen Rose	50	50.41	No
		Twin Mountains	68	61.87	No
Wise	outcrop	Antlers	60	16.44	No
		Paluxy	—	—	—
		Glen Rose	—	—	—
		Twin Mountains	—	—	—
	subcrop	Antlers	154	92.38	No
		Paluxy	—	—	—
		Glen Rose	—	—	—
		Twin Mountains	—	—	—

Appendix B

Comparison between Desired Future Conditions and Drawdowns for the Marble Falls, Ellenburger-San Saba, and Hickory Aquifers in Brown, Burnet, Lampasas, and Mills Counties

The water level file from the predictive model output was used to calculate the drawdown (D) within the modeled extent for each aquifer between 2009 and 2080 using the following equation:

$$D = \frac{\sum_{i=1}^{n}(h2009_i - h2080_i)}{n}$$

Where:

n = Total model cells in a county

$h2009_i$ = Water level of 2009 at model cell i (feet)

$h2080_i$ = Water level of 2080 at model cell i (feet)

Model cells with water level values below the cell bottom in 2009 were excluded from the calculation. Also, water level was set at the cell bottom if it fell below the cell bottom in 2080.

The comparison between the simulated drawdowns and the desired future conditions is presented in Table B1. The comparison 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. 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	Desired Future Condition (feet of drawdown between 2009 and 2080)	Simulated Drawdown between 2009 and 2080 (feet)	Is Desired Future Condition Violated?
Brown	Marble Falls	3	3	no
	Ellenburger-San Saba	3	3	no
	Hickory	3	3	no
Burnet	Marble Falls	11	11	no
	Ellenburger-San Saba	12	9	no
	Hickory	11	11	no
Lampasas	Marble Falls	16	16	no
	Ellenburger-San Saba	16	16	no
	Hickory	16	16	no
Mills	Marble Falls	9	9	no
	Ellenburger-San Saba	9	9	no
	Hickory	9	9	no

Appendix C

Summary of Dry Model Cell Count for the Trinity, Woodbine, Marble Falls, Ellenburger-San Saba, and Hickory Aquifers

TABLE C1. SUMMARY OF DRY MODEL CELLS FOR TRINITY AND WOODBINE AQUIFERS FROM PREDICTIVE SIMULATION.

County	Aquifer	Year	Total Aquifer Cells	Dry Cells
Bell	Paluxy	2009	1,767	0
		2080	1,767	0
	Glen Rose	2009	23,737	0
		2080	23,737	8
	Hensell	2009	17,390	0
		2080	17,390	0
	Hosston	2009	17,390	0
		2080	17,390	0
	Travis Peak	2009	52,170	0
		2080	52,170	0
Bosque	Paluxy	2009	13,818	0
		2080	13,818	0
	Glen Rose	2009	22,360	0
		2080	22,360	0
	Hensell	2009	16,034	0
		2080	16,034	0
	Hosston	2009	16,034	0
		2080	16,034	0
	Travis Peak	2009	48,102	0
		2080	48,102	0
Brown	Glen Rose	2009	36	0
		2080	36	0
	Hensell	2009	1,608	0
		2080	1,608	0
	Hosston	2009	10,258	0
		2080	10,258	0
	Travis Peak	2009	15,847	0
		2080	15,847	0
	Antlers	2009	12,354	0
		2080	12,354	0

TABLE C1 (CONT). SUMMARY OF DRY MODEL CELLS FOR TRINITY AND WOODBINE AQUIFERS FROM PREDICTIVE SIMULATION.

County	Aquifer	Year	Total Aquifer Cells	Dry Cells
Burnet	Glen Rose	2009	22,534	0
		2080	22,534	0
	Hensell	2009	12,332	0
		2080	12,332	0
	Hosston	2009	22,320	217
		2080	22,320	765
	Travis Peak	2009	44,433	217
		2080	44,433	828
Callahan	Antlers	2009	34,576	0
		2080	34,576	0
Collin	Woodbine	2009	11,762	0
		2080	11,762	2
	Paluxy	2009	12,062	0
		2080	12,062	319
	Glen Rose	2009	12,062	0
		2080	12,062	0
	Twin Mountains	2009	36,186	0
		2080	36,186	0
	Antlers	2009	7,055	0
		2080	7,055	172
Comanche	Glen Rose	2009	1,440	0
		2080	1,440	0
	Hensell	2009	22,362	0
		2080	22,362	0
	Hosston	2009	41,062	0
		2080	41,062	353
	Travis Peak	2009	78,137	0
		2080	78,137	353
	Antlers	2009	23,711	123
		2080	23,711	3,149
Cooke	Woodbine	2009	5,700	0
		2080	5,700	26
	Antlers	2009	77,047	0
		2080	77,047	839

TABLE C1 (CONT). SUMMARY OF DRY MODEL CELLS FOR TRINITY AND WOODBINE AQUIFERS FROM PREDICTIVE SIMULATION.

County	Aquifer	Year	Total Aquifer Cells	Dry Cells
Coryell	Paluxy	2009	6,512	0
		2080	6,512	0
	Glen Rose	2009	41,647	11
		2080	41,647	25
	Hensell	2009	16,914	0
		2080	16,914	0
	Hosston	2009	16,914	0
		2080	16,914	0
	Travis Peak	2009	50,742	0
		2080	50,742	0
Dallas	Woodbine	2009	14,152	0
		2080	14,152	0
	Paluxy	2009	14,532	0
		2080	14,532	10
	Glen Rose	2009	14,532	0
		2080	14,532	0
	Hensell	2009	80	0
		2080	80	0
	Hosston	2009	80	0
		2080	80	0
	Twin Mountains	2009	43,353	0
		2080	43,353	0
	Travis Peak	2009	243	0
		2080	243	0
Delta	Paluxy	2009	1,217	0
		2080	1,217	0
	Glen Rose	2009	1,217	0
		2080	1,217	0
	Travis Peak	2009	3,651	0
		2080	3,651	0

TABLE C1 (CONT). SUMMARY OF DRY MODEL CELLS FOR TRINITY AND WOODBINE AQUIFERS FROM PREDICTIVE SIMULATION.

County	Aquifer	Year	Total Aquifer Cells	Dry Cells
Denton	Woodbine	2009	11,991	3
		2080	11,991	10
	Paluxy	2009	3,520	0
		2080	3,520	2,115
	Glen Rose	2009	3,520	0
		2080	3,520	0
	Twin Mountains	2009	10,560	0
		2080	10,560	84
	Antlers	2009	59,107	0
		2080	59,107	5,738
Eastland	Antlers	2009	44,009	74
		2080	44,009	1,116
Ellis	Woodbine	2009	14,207	0
		2080	14,207	0
	Paluxy	2009	15,173	0
		2080	15,173	0
	Glen Rose	2009	15,209	0
		2080	15,209	0
	Hensell	2009	15,120	0
		2080	15,120	0
	Hosston	2009	15,120	0
		2080	15,120	0
	Twin Mountains	2009	225	0
		2080	225	0
	Travis Peak	2009	45,402	0
		2080	45,402	0

TABLE C1 (CONT). SUMMARY OF DRY MODEL CELLS FOR TRINITY AND WOODBINE AQUIFERS FROM PREDICTIVE SIMULATION.

County	Aquifer	Year	Total Aquifer Cells	Dry Cells
Erath	Paluxy	2009	1,443	0
		2080	1,443	0
	Glen Rose	2009	20,905	0
		2080	20,905	32
	Hensell	2009	21,880	0
		2080	21,880	83
	Hosston	2009	8,464	0
		2080	8,464	372
	Twin Mountains	2009	46,114	20
		2080	46,114	286
	Travis Peak	2009	39,220	0
		2080	39,220	1,006
	Antlers	2009	8,983	0
		2080	8,983	962
Falls	Paluxy	2009	1,439	0
		2080	1,439	0
	Glen Rose	2009	5,840	0
		2080	5,840	0
	Hensell	2009	5,840	0
		2080	5,840	0
	Hosston	2009	5,840	0
		2080	5,840	0
	Travis Peak	2009	17,520	0
		2080	17,520	0
Fannin	Woodbine	2009	15,443	3
		2080	15,443	60
	Paluxy	2009	1,582	0
		2080	1,582	0
	Glen Rose	2009	1,582	0
		2080	1,582	0
	Twin Mountains	2009	1,758	0
		2080	1,758	0
	Travis Peak	2009	2,988	0
		2080	2,988	0
	Antlers	2009	63,730	0
		2080	63,730	0

TABLE C1 (CONT). SUMMARY OF DRY MODEL CELLS FOR TRINITY AND WOODBINE AQUIFERS FROM PREDICTIVE SIMULATION.

County	Aquifer	Year	Total Aquifer Cells	Dry Cells
Grayson	Woodbine	2009	17,911	2
		2080	17,911	58
	Paluxy	2009	77	0
		2080	77	0
	Glen Rose	2009	77	0
		2080	77	0
	Twin Mountains	2009	231	0
		2080	231	0
	Antlers	2009	77,954	0
		2080	77,954	327
Hamilton	Paluxy	2009	1,897	0
		2080	1,897	0
	Glen Rose	2009	36,944	0
		2080	36,944	13
	Hensell	2009	16,890	0
		2080	16,890	0
	Hosston	2009	13,373	0
		2080	13,373	0
	Travis Peak	2009	43,636	0
		2080	43,636	0
Hill	Woodbine	2009	12,602	0
		2080	12,602	0
	Paluxy	2009	15,648	0
		2080	15,648	0
	Glen Rose	2009	15,766	0
		2080	15,766	0
	Hensell	2009	15,766	0
		2080	15,766	0
	Hosston	2009	15,766	0
		2080	15,766	0
	Travis Peak	2009	47,298	0
		2080	47,298	157

TABLE C1 (CONT). SUMMARY OF DRY MODEL CELLS FOR TRINITY AND WOODBINE AQUIFERS FROM PREDICTIVE SIMULATION.

County	Aquifer	Year	Total Aquifer Cells	Dry Cells
Hood	Paluxy	2009	434	0
		2080	434	0
	Glen Rose	2009	14,461	0
		2080	14,461	74
	Hensell	2009	117	0
		2080	117	0
	Hosston	2009	117	0
		2080	117	5
	Twin Mountains	2009	37,444	0
		2080	37,444	1,710
	Travis Peak	2009	351	0
		2080	351	5
Hunt	Woodbine	2009	2,193	0
		2080	2,193	0
	Paluxy	2009	1,362	0
		2080	1,362	0
	Glen Rose	2009	1,362	0
		2080	1,362	0
	Twin Mountains	2009	492	0
		2080	492	0
	Travis Peak	2009	3,594	0
		2080	3,594	0
Johnson	Woodbine	2009	8,407	14
		2080	8,407	68
	Paluxy	2009	11,627	17
		2080	11,627	0
	Glen Rose	2009	12,342	15
		2080	12,342	37
	Hensell	2009	9,462	0
		2080	9,462	0
	Hosston	2009	9,462	0
		2080	9,462	1,278
	Twin Mountains	2009	6,816	0
		2080	6,816	1,836
	Travis Peak	2009	28,386	0
		2080	28,386	1,278

TABLE C1 (CONT). SUMMARY OF DRY MODEL CELLS FOR TRINITY AND WOODBINE AQUIFERS FROM PREDICTIVE SIMULATION.

County	Aquifer	Year	Total Aquifer Cells	Dry Cells
Kaufman	Woodbine	2009	1,616	0
		2080	1,616	0
	Paluxy	2009	1,321	0
		2080	1,321	0
	Glen Rose	2009	1,331	0
		2080	1,331	0
	Hensell	2009	82	0
		2080	82	0
	Hosston	2009	82	0
		2080	82	0
	Twin Mountains	2009	960	0
		2080	960	0
	Travis Peak	2009	3,033	0
		2080	3,033	0
Lamar	Woodbine	2009	9,839	0
		2080	9,839	0
	Paluxy	2009	12,260	0
		2080	12,260	0
	Glen Rose	2009	12,260	0
		2080	12,260	0
	Travis Peak	2009	36,780	0
		2080	36,780	0
	Antlers	2009	7,995	0
		2080	7,995	0
Lampasas	Glen Rose	2009	8,692	0
		2080	8,692	0
	Hensell	2009	25,364	1
		2080	25,364	1
	Hosston	2009	23,100	0
		2080	23,100	0
	Travis Peak	2009	62,529	1
		2080	62,529	1

TABLE C1 (CONT). SUMMARY OF DRY MODEL CELLS FOR TRINITY AND WOODBINE AQUIFERS FROM PREDICTIVE SIMULATION.

County	Aquifer	Year	Total Aquifer Cells	Dry Cells
Limestone	Paluxy	2009	962	0
		2080	962	0
	Glen Rose	2009	1,760	0
		2080	1,760	0
	Hensell	2009	1,760	0
		2080	1,760	0
	Hosston	2009	1,760	0
		2080	1,760	0
	Travis Peak	2009	5,280	0
		2080	5,280	0
McLennan	Woodbine	2009	1,909	0
		2080	1,909	0
	Paluxy	2009	16,952	0
		2080	16,952	0
	Glen Rose	2009	16,991	0
		2080	16,991	0
	Hensell	2009	16,991	0
		2080	16,991	0
	Hosston	2009	16,991	0
		2080	16,991	16
	Travis Peak	2009	50,973	0
		2080	50,973	16
Milam	Glen Rose	2009	2,579	0
		2080	2,579	0
	Hensell	2009	2,579	0
		2080	2,579	0
	Hosston	2009	2,579	0
		2080	2,579	0
	Travis Peak	2009	7,737	0
		2080	7,737	0

TABLE C1 (CONT). SUMMARY OF DRY MODEL CELLS FOR TRINITY AND WOODBINE AQUIFERS FROM PREDICTIVE SIMULATION.

County	Aquifer	Year	Total Aquifer Cells	Dry Cells
Mills	Paluxy	2009	936	0
		2080	936	0
	Glen Rose	2009	10,615	0
		2080	10,615	2
	Hensell	2009	18,539	0
		2080	18,539	0
	Hosston	2009	14,226	0
		2080	14,226	0
	Travis Peak	2009	42,934	0
		2080	42,934	0
Montague	Antlers	2009	52,693	0
		2080	52,693	417
Navarro	Woodbine	2009	1,578	0
		2080	1,578	0
	Paluxy	2009	1,755	0
		2080	1,755	0
	Glen Rose	2009	6,326	0
		2080	6,326	0
	Hensell	2009	6,326	0
		2080	6,326	0
	Hosston	2009	6,326	0
		2080	6,326	0
	Travis Peak	2009	18,978	0
		2080	18,978	0
Parker	Paluxy	2009	5,637	0
		2080	5,637	0
	Glen Rose	2009	11,389	8
		2080	11,389	753
	Twin Mountains	2009	30,326	0
		2080	30,326	223
	Antlers	2009	40,600	0
		2080	40,600	435

TABLE C1 (CONT). SUMMARY OF DRY MODEL CELLS FOR TRINITY AND WOODBINE AQUIFERS FROM PREDICTIVE SIMULATION.

County	Aquifer	Year	Total Aquifer Cells	Dry Cells
Red River	Woodbine	2009	4,222	0
		2080	4,222	0
	Paluxy	2009	8,494	0
		2080	8,494	0
	Glen Rose	2009	8,494	0
		2080	8,494	0
	Travis Peak	2009	25,482	0
		2080	25,482	0
	Antlers	2009	1,065	0
		2080	1,065	0
Rockwall	Woodbine	2009	33	0
		2080	33	0
	Paluxy	2009	711	0
		2080	711	0
	Glen Rose	2009	711	0
		2080	711	0
	Twin Mountains	2009	2,133	0
		2080	2,133	0
Somervell	Paluxy	2009	851	0
		2080	851	0
	Glen Rose	2009	11,274	0
		2080	11,274	0
	Hensell	2009	3,045	0
		2080	3,045	0
	Hosston	2009	2,640	0
		2080	2,640	0
	Twin Mountains	2009	1,660	0
		2080	1,660	0
	Travis Peak	2009	8,325	0
		2080	8,325	0

TABLE C1 (CONT). SUMMARY OF DRY MODEL CELLS FOR TRINITY AND WOODBINE AQUIFERS FROM PREDICTIVE SIMULATION.

County	Aquifer	Year	Total Aquifer Cells	Dry Cells
Tarrant	Woodbine	2009	8,901	2
		2080	8,901	3
	Paluxy	2009	15,389	3
		2080	15,389	1,926
	Glen Rose	2009	13,571	0
		2080	13,571	0
	Twin Mountains	2009	40,713	0
		2080	40,713	6,065
	Antlers	2009	5,009	0
		2080	5,009	1,033
Taylor	Antlers	2009	6,176	0
		2080	6,176	0
Travis	Glen Rose	2009	14,314	25
		2080	14,314	0
	Hensell	2009	11,310	0
		2080	11,310	0
	Hosston	2009	9,400	57
		2080	9,400	123
	Travis Peak	2009	30,124	57
		2080	30,124	124
Williamson	Glen Rose	2009	24,271	0
		2080	24,271	0
	Hensell	2009	17,454	0
		2080	17,454	0
	Hosston	2009	17,454	0
		2080	17,454	0
	Travis Peak	2009	52,362	0
		2080	52,362	0
Wise	Antlers	2009	90,469	0
		2080	90,469	3,563

TABLE C2. SUMMARY OF DRY MODEL CELLS FOR MARBLE FALLS, ELLENBURGER-SAN SABA, AND HICKORY AQUIFERS IN BROWN, BURNET, LAMPASAS, AND MILLS COUNTIES FROM PREDICTIVE SIMULATION.

County	Aquifer	Active Cells	Dry Cells (2009)	Dry Cells (2080)
Brown	Marble Falls	1,635	0	0
	Ellenburger-San Saba	1,635	0	0
	Hickory	1,635	0	0
Burnet	Marble Falls	10,810	2,298	2,450
	Ellenburger-San Saba	13,618	709	851
	Hickory	14,334	111	131
Lampasas	Marble Falls	7,614	611	683
	Ellenburger-San Saba	7,895	0	0
	Hickory	7,895	0	0
Mills	Marble Falls	3,540	0	0
	Ellenburger-San Saba	3,540	0	0
	Hickory	3,540	0	0

Appendix C
State Water Plan 2022

TWDB Estimated Historical Groundwater Use and 2022 State Water Plan Datasets

Saratoga Underground Water Conservation District

Texas Water Development Board
Groundwater Division
Groundwater Technical Assistance Department
stephen.allen@twdb.texas.gov
(512) 463-7317
March 27, 2025

GROUNDWATER MANAGEMENT PLAN DATA

This set of water data tables (part one of a two-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 table addresses a specific numbered requirement in the Texas Water Development Board's groundwater management plan review checklist. The checklist can be found at this web address:

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

The five tables included in part one of this data package are:

TWDB Historical Water Use Survey (WUS)

- Estimated Historical Water Use (checklist item 2)

State Water Plan (SWP)

- Projected Surface Water Supplies (checklist item 6),
- Projected Water Demands (checklist item 7),
- Projected Water Supply Needs (checklist item 8),
- Projected Water Management Strategies (checklist item 9)

Part two of the two-part package is the groundwater availability model (GAM) run report for the district (checklist items 3 through 5). The district should have received, or will receive, this report from the TWDB Groundwater Modeling Department. Questions about the GAM can be directed to GAM@twdb.texas.gov

DISCLAIMER:

Data presented in these tables are the most up to date WUS and SWP data available as of 3/27/2025. Although it does not happen often, these data are subject to change pending the availability of more accurate WUS data or an amendment to the 2022 SWP. District personnel should review the data table values and correct any discrepancies to ensure approval of their groundwater management plan.

The WUS data can be verified at this web address:

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

The 2022 SWP data can be verified by contacting WRPdatarequests@twdb.texas.gov.

The values presented in the data tables are county based. In cases where groundwater conservation districts cover only a portion of one or more counties the data values are modified with an apportioning multiplier to create new values that more accurately represent conditions within district boundaries. The multiplier used in the following formula is a land area ratio: (data value * (land area of district in county / land area of county)). For two of the four SWP tables (Projected Surface Water Supplies and Projected Water Demands) only the county-wide water user group (WUG) data values (county other, manufacturing, steam electric power, irrigation, mining, and livestock) are modified using the multiplier. WUG values for municipalities, water supply corporations, and utility districts are not apportioned; instead, their full values are retained when they are located within the district and eliminated when they are located outside (we offer districts the opportunity to review this determination).

The county values in two of the SWP tables (Projected Water Supply Needs and Projected Water Management Strategies) are not apportioned because district-specific values are not required to be presented in the groundwater management plan. However, a district is required to “consider” the county values in these two tables by drafting a short summary of the needs and strategies values in the groundwater management plan.

In the WUS table every category of water use (including municipal) is apportioned. Staff determined that breaking down the annual municipal values into individual WUGs was too complex.

TWDB recognizes that the apportioning formula used is not ideal but it is the best available process with respect to time and staffing constraints. If a district believes it has data that are more accurate, they can add those data to the plan with an explanation of how the data were derived. Apportioning percentages that the TWDB used are listed above each applicable table.

For additional questions regarding these data, please contact stephen.allen@twdb.texas.gov, 512-463-7317 or GWMPlans@twdb.texas.gov.

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

LAMPASAS COUNTY *100% (multiplier)* All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2021	GW	102	0	0	0	99	194	395
	SW	3,709	160	28	0	414	359	4,670
2020	GW	97	0	0	0	97	197	391
	SW	3,907	165	33	0	457	366	4,928
2019	GW	20	0	0	0	106	197	323
	SW	3,637	180	36	0	438	366	4,657
2018	GW	35	0	0	0	111	197	343
	SW	3,777	163	28	0	623	365	4,956
2017	GW	114	0	0	0	112	192	418
	SW	3,685	172	46	0	83	355	4,341
2016	GW	124	0	0	0	98	170	392
	SW	3,198	163	37	0	562	315	4,275
2015	GW	129	0	0	0	46	165	340
	SW	3,458	149	37	0	338	305	4,287
2014	GW	137	0	0	0	165	161	463
	SW	3,193	155	24	0	345	298	4,015
2013	GW	164	0	0	0	64	158	386
	SW	3,479	198	55	0	625	293	4,650
2012	GW	146	0	0	0	128	173	447
	SW	3,584	181	46	0	280	320	4,411

Projected Surface Water Supplies
TWDB 2022 State Water Plan Data

LAMPASAS COUNTY *100% (multiplier)* All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
G	Copperas Cove	Brazos	Brazos River Authority Little River Lake/Reservoir System	248	295	325	355	263	221
G	Corix Utilities Texas Inc	Brazos	Highland Lakes Lake/Reservoir System	30	29	29	29	29	30
G	Corix Utilities Texas Inc	Colorado	Highland Lakes Lake/Reservoir System	21	21	21	21	21	21
G	County-Other, Lampasas	Brazos	Brazos River Authority Little River Lake/Reservoir System	161	173	185	199	209	221
G	County-Other, Lampasas	Colorado	Brazos River Authority Little River Lake/Reservoir System	34	36	40	41	45	46
G	Irrigation, Lampasas	Brazos	Brazos Run-of-River	3	0	0	0	0	0
G	Irrigation, Lampasas	Colorado	Brazos Run-of-River	100	100	97	94	91	88
G	Kempner WSC	Brazos	Brazos River Authority Little River Lake/Reservoir System	1,361	1,328	1,293	1,263	1,233	1,205
G	Lampasas	Brazos	Brazos River Authority Little River Lake/Reservoir System	1,144	1,130	1,116	1,103	1,086	1,068
G	Livestock, Lampasas	Brazos	Brazos Livestock Local Supply	397	397	397	397	397	397
G	Livestock, Lampasas	Colorado	Brazos Livestock Local Supply	228	228	228	228	228	228
G	Manufacturing, Lampasas	Brazos	Brazos River Authority Little River Lake/Reservoir System	137	151	165	178	195	213
G	Manufacturing, Lampasas	Brazos	Brazos Run-of-River	48	38	29	19	10	0
G	Mining, Lampasas	Brazos	Brazos River Authority Little River Lake/Reservoir System	25	25	25	25	25	25
			Sum of Projected Surface Water Supplies (acre-feet)	**3,937**	**3,951**	**3,950**	**3,952**	**3,832**	**3,763**

Projected Water Demands
TWDB 2022 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.

LAMPASAS COUNTY

100% (multiplier)

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
G	Copperas Cove	Brazos	123	160	195	233	268	300
G	Corix Utilities Texas Inc	Brazos	203	203	212	223	231	240
G	Corix Utilities Texas Inc	Colorado	145	144	150	158	164	171
G	County-Other, Lampasas	Brazos	124	128	112	96	84	73
G	County-Other, Lampasas	Colorado	26	27	24	20	18	15
G	Irrigation, Lampasas	Brazos	140	140	140	140	140	140
G	Irrigation, Lampasas	Colorado	398	398	398	398	398	398
G	Kempner WSC	Brazos	1,669	1,809	1,919	2,040	2,155	2,260
G	Lampasas	Brazos	1,265	1,356	1,424	1,506	1,590	1,668
G	Livestock, Lampasas	Brazos	397	397	397	397	397	397
G	Livestock, Lampasas	Colorado	228	228	228	228	228	228
G	Manufacturing, Lampasas	Brazos	198	216	216	216	216	216
G	Mining, Lampasas	Brazos	148	165	180	195	214	234
G	Mining, Lampasas	Colorado	50	56	61	66	72	79
		Sum of Projected Water Demands (acre-feet)	**5,114**	**5,427**	**5,656**	**5,916**	**6,175**	**6,419**

Projected Water Supply Needs
TWDB 2022 State Water Plan Data

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

LAMPASAS COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
G	Copperas Cove	Brazos	125	135	130	122	-5	-79
G	Corix Utilities Texas Inc	Brazos	-57	-61	-69	-78	-86	-93
G	Corix Utilities Texas Inc	Colorado	-42	-43	-48	-55	-60	-66
G	County-Other, Lampasas	Brazos	47	55	83	113	135	158
G	County-Other, Lampasas	Colorado	9	10	17	22	28	32
G	Irrigation, Lampasas	Brazos	-4	-7	-7	-7	-7	-7
G	Irrigation, Lampasas	Colorado	-223	-223	-226	-229	-232	-235
G	Kempner WSC	Brazos	-308	-481	-626	-777	-922	-1,055
G	Lampasas	Brazos	-121	-226	-308	-403	-504	-600
G	Livestock, Lampasas	Brazos	0	0	0	0	0	0
G	Livestock, Lampasas	Colorado	0	0	0	0	0	0
G	Manufacturing, Lampasas	Brazos	-13	-27	-22	-19	-11	-3
G	Mining, Lampasas	Brazos	-64	-81	-96	-111	-130	-150
G	Mining, Lampasas	Colorado	-30	-36	-41	-46	-52	-59
		Sum of Projected Water Supply Needs (acre-feet)	**-862**	**-1,185**	**-1,443**	**-1,725**	**-2,009**	**-2,347**

Projected Water Management Strategies
TWDB 2022 State Water Plan Data

LAMPASAS COUNTY

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

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
Copperas Cove, Brazos (G)							
Lake Granger Augmentation-Ph 2 (Groundwater)	Carrizo-Wilcox Aquifer [Milam]	0	0	0	0	0	23
Purchase Raw Water from Fort Hood	Brazos Run-of-River [Bell]	0	0	0	0	5	56
		0	**0**	**0**	**0**	**5**	**79**
Corix Utilities Texas Inc, Brazos (G)							
Gulf Coast Aquifer Development	Gulf Coast Aquifer System [Washington]	57	61	69	78	86	93
		57	**61**	**69**	**78**	**86**	**93**
Corix Utilities Texas Inc, Colorado (G)							
Gulf Coast Aquifer Development	Gulf Coast Aquifer System [Washington]	42	43	48	55	60	66
		42	**43**	**48**	**55**	**60**	**66**
Irrigation, Lampasas, Brazos (G)							
Irrigation Water Conservation	DEMAND REDUCTION [Lampasas]	4	7	7	7	7	7
Marble Falls Aquifer Development	Marble Falls Aquifer [Lampasas]	0	0	0	0	0	0
		4	**7**	**7**	**7**	**7**	**7**
Irrigation, Lampasas, Colorado (G)							
Irrigation Water Conservation	DEMAND REDUCTION [Lampasas]	12	20	31	31	31	31
Marble Falls Aquifer Development	Marble Falls Aquifer [Lampasas]	211	203	195	198	201	204
		223	**223**	**226**	**229**	**232**	**235**
Kempner WSC, Brazos (G)							
Kempner WSC WTP Expansion	Brazos River Authority Little River Lake/Reservoir System [Reservoir]	714	708	702	1,255	1,247	1,238
Municipal Water Conservation - Kempner WSC	DEMAND REDUCTION [Lampasas]	0	152	150	147	152	158
		714	**860**	**852**	**1,402**	**1,399**	**1,396**
Lampasas, Brazos (G)							
Lake Granger Augmentation-Ph 2 (Groundwater)	Carrizo-Wilcox Aquifer [Milam]	0	610	629	649	668	687
		0	**610**	**629**	**649**	**668**	**687**
Manufacturing, Lampasas, Brazos (G)							
Industrial Water Conservation	DEMAND REDUCTION [Lampasas]	6	11	15	15	15	15
Purchase Treated Water from City of Lampasas	Brazos River Authority Little River Lake/Reservoir System [Reservoir]	7	16	7	4	0	0

		13	**27**	**22**	**19**	**15**	**15**
Mining, Lampasas, Brazos (G)							
Ellenburger-San Saba Aquifer Development	Ellenburger-San Saba Aquifer [Lampasas]	60	73	83	97	115	133
Industrial Water Conservation	DEMAND REDUCTION [Lampasas]	4	8	13	14	15	17
		64	**81**	**96**	**111**	**130**	**150**
Mining, Lampasas, Colorado (G)							
Ellenburger-San Saba Aquifer Development	Ellenburger-San Saba Aquifer [Lampasas]	28	33	37	42	47	54
Industrial Water Conservation	DEMAND REDUCTION [Lampasas]	2	3	4	4	5	5
		30	**36**	**41**	**46**	**52**	**59**
Sum of Projected Water Management Strategies (acre-feet)		**1,147**	**1,948**	**1,990**	**2,596**	**2,654**	**2,787**

Appendix D: Required Documentation to be Submitted for Texas Water Development Board

Saratoga Underground Water Conservation District

PO Box 168, Lampasas, TX 76550

(512) 734-4073 www.saratogauwcd.org

Email: saratogauwcd@gmail.com

Board of Directors

Precinct 1: Ruben Martinez
Precinct 3: Paul Cline

Precinct 2: Stan Wilson
Precinct 4: Laresa Yick

At Large:

Regular Meeting

Friday, September 5, 2025 at 11:00 AM

Lampasas County Annex Conference room, Lampasas TX 76550

THE BOARD OF DIRECTORS MAY DISCUSS/CONSIDER AND TAKE POSSIBLE ACTION ON THE FOLLOWING AGENDA ITEMS OF BUSINESS:

1. Call to order.
2. Public Comments and Announcements. (Public Participation Form)
3. Review minutes from hearing & regular meeting June 20, 2025
4. Subdivision Review
5. At Large Position Appointment
6. Management Plan Adoption
7. 2025-2026 Budget
8. General Manager's Report
   a. Drought Index
   b. Well Registrations
   c. Financial Report
   d. GMA8 activity
   e. TAGD Activity
   f. Public Outreach & marketing
9. Set next Saratoga UWCD regular meeting date.
10. Adjourn.

The above agenda schedule represents an estimate of the order for the indicated items and is subject to change at any time.

Pursuant to the authority granted under Government Code, Chapter 551, the Board of Directors may convene in closed session to discuss any of the above agenda items. Immediately before any closed session, the specific sections(s) of Government Code, Chapter 551 that provides statutory authority will be announced. I hereby certify that the above notice was posted on the inside bulletin board on the first floor of the Lampasas County Courthouse 72 hours prior to the above listed meeting.

____

Tasha Bates, General Manager

FILED

10 a.m.______ p.m. o'clock

SEP 02 2025

By [signature] Deputy

County Court, Lampasas County, TX

Clerk, Dianne Miller

Saratoga Underground Water Conservation District

PO Box 168, Lampasas, TX 76550 (512) 734-4073

www.saratogauwcd.org Email: saratogauwcd@gmail.com

Board of Directors

Precinct 1: Ruben Martinez | Precinct 2: Stan Wilson

Precinct 3: Paul Cline | At Large: vacant | Precinct 4: Laresa Yick

September 11, 2025
State of Texas, County of Lampasas
The Saratoga Underground Water Conservation District (SUWCD) conducted a regular meeting on Friday, September 5, 2025. Directors Cline, Yick and Wilson were present so a Quorum was declared. Director PR Cline called the meeting to order at 11:02am and presided.

Item 2 was for public comments. There were few citizens in attendance, but no comments were presented.

Item 3 reviewed the June 20, 2025 hearing and meeting minutes. Director Wilson made a motion to approve those minutes. Director Yick made the second, there was no discussion. The motion was unanimously approved.

Item 4 was to discuss or review any new developments in the area, as there was none and no further discussion. The agenda item was tabled.

Item 5 was discussion to appoint someone to the At Large position. The nominating or search committee suggested Mike Watson to fill that vacancy. Director Wilson made the motion, Director Yick made the second and all approved.

Item 6 reviewed the updated management plan as a final draft to be submitted to the Texas Water Development Board. It will be submitted to bordering entities and available on the website for viewing as it is awaiting final approval by the state agencies. Director Wilson made the motion to adopt and approve as submitted, Director Cline seconded. All approved.

Item 7 considered the 2025-2026 budget as submitted by GM Bates. Some discussion went over the balance of expenses in relation to the revenue. Director Wilson made the motion to approve the budget as presented, Director Cline second. All approved.

Item 8 reviewed several comments from the General Manager. The drought index and well registration reports were submitted. A financial statement was reported as of August 31, 2025 at $109,822.01. Along with that the GMA8 invoiced a bill outside the budget for $3,473.07. Director Yick made the motion to pay that bill, Director Wilson second. All approved. The next meeting for GMA8 is September 22, 2025. Still reviewing my notes from the TAGD conference and looking forward to new opportunity. We are transitioning through the fiscal year and getting ready for fall outreach. We are partnering with the Agri-life office to present at a well owner's workshop in November.

Item 9 was discussion to set the next quarterly meeting in early to mid November. GM Bates will advise all directors of a more specified date and time.

Item 10 the meeting was adjourned at 11:35 AM with a motion by Director Cline and second by Director Wilson. All approved.

Tasha Bates, General Manager

Saratoga Underground Water Conservation District
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Email: saratogauwcd@gmail.com

Board of Directors
Precinct 1: Ruben Martinez
Precinct 2: Stan Wilson
Precinct 3: Paul Cline
Precinct 4: Laresa Yick
At Large: Vacant

September 12, 2025

Brazos River Authority
c/o Judi Pierce, Public Information
4600 Cobbs Dr
PO Box 7555
Waco, TX 76714

Dear Ms Pierce:

Enclosed is a copy of the recently adopted Saratoga Underground Water Conservation District (SUWCD) Management Plan as required by Texas Water Code Chapter 36 for your review and approval.

In addition to the adopted management plan, the following supporting documentation is enclosed:
1. Copy of the posted meeting agenda for the September 5, 2025 SUWCD Board of Directors meeting.
3. Copy of the meeting minutes for the September 5, 2025 as the management plan adoption.

You may also find a copy of our management plan here: www.saratogauwcd.org/rules--resources.html

Please do email back or call with any questions or concerns.

Thank you,

Tasha Bates
General Manager

Saratoga Underground Water Conservation District

PO Box 168, Lampasas, TX 76550

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Board of Directors

Precinct 1: Ruben Martinez
Precinct 2: Stan Wilson
Precinct 3: Paul Cline
Precinct 4: Laresa Yick

At Large: Vacant

September 12, 2025

LCRA
c/o John Palacio, Regional Management
3700 Lake Austin Blvd
PO Box 220
Austin, TX 78767

Dear Mr Palacio:

Enclosed is a copy of the recently adopted Saratoga Underground Water Conservation District (SUWCD) Management Plan as required by Texas Water Code Chapter 36 for your review and approval.

In addition to the adopted management plan, the following supporting documentation is enclosed:
1. Copy of the posted meeting agenda for the September 5, 2025 SUWCD Board of Directors meeting.
3. Copy of the meeting minutes for the September 5, 2025 as the management plan adoption.

You may also find a copy of our management plan here: www.saratogauwcd.org/rules--resources.html

Please do email back or call with any questions or concerns.

Thank you,

Tasha Bates
General Manager