



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

June 27, 2025

Rhetta Hector  
General Manager  
Glasscock Groundwater Conservation District  
PO Box 208,  
Garden City, Texas 79739

Dear Ms. Hector:

This letter is to notify you that the Glasscock Groundwater Conservation District's groundwater 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 May 22, 2025, and it was approved on June 27, 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 June 27, 2030.

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](mailto:stephen.allen@twdb.texas.gov)

Sincerely,

A handwritten signature in black ink that reads "Bryan McMath".

Bryan McMath  
Executive Administrator

Enclosure

c w/o enc.: Stephen Allen, P.G., Groundwater  
Robert Bradley, P.G., Groundwater  
Abiy Berehe, P.G., Texas Commission on Environmental Quality  
Peggy Hunka, P.G., Texas Commission on Environmental Quality  
Kory Talcott, 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

# GLASSCOCK GROUNDWATER CONSERVATION DISTRICT

GALEN SCHWARTZ, PRESIDENT  
ALLAN FUCHS, V-PRESIDENT  
LANE HALFMANN, MEMBER  
RUSSELL HALFMANN, MEMBER  
BART BELEW, MEMBER  
RHETTA HECTOR, GENERAL MANAGER  
ROCIO DE LUNA, ADMIN. ASSISTANT

---

P.O. BOX 208 132 N. MAIN GARDEN CITY, TEXAS 79739 PHONE (432) 354-2430 FAX (432) 354-2322  
E-MAIL: glasscockgroundwater@yahoo.com

May 21, 2025

To whom it may concern,

As General Manager of the Glasscock Groundwater Conservation District (Glasscock GCD), I am hereby stating that Glasscock GCD has adopted our 2024-2029 Management Plan at a public hearing that took place on Tuesday May 20, 2025.

The board of directors has adopted the plan and are ready to move forward with the completion processes.

Thank you,



Rhetta Hector  
General Manager

# **GLASSCOCK GROUNDWATER CONSERVATION DISTRICT**



## **GROUNDWATER MANAGEMENT PLAN**

**2024-2029**

Adopted : May 20, 2025

**P.O. Box 208**

**132 N. Main**

**Garden City, Texas 79739**

**Ph: 432-354-2430**

**Fax: 432-354-2322**

**E-mail: [glasscockgroundwater@yahoo.com](mailto:glasscockgroundwater@yahoo.com)**

**Website: [glasscock-groundwater.org](http://glasscock-groundwater.org)**



# Table of Contents

District Mission .....	1
Time Period for this Plan.....	1
Statement of Guiding Principles.....	1
General Description.....	1
Regional Cooperation and Coordination.....	2
Location and Extent.....	3
Topography and Drainage .....	3
Groundwater Resources .....	4
Edwards-Trinity (Plateau) Aquifer.....	4
Ogallala Aquifer .....	5
Dockum Aquifer.....	6
Lipan Aquifer .....	7
Technical District Information Required by Texas Administrative Code .....	7
Modeled Available Groundwater in the District .....	8
Amount of Groundwater Being Used within the District on an Annual Basis .....	8
Annual Volume of Water that Discharges from the Aquifer to Springs and Surface Water Bodies	8
Estimate of the Annual Volume of Flow into the District, out of the District and Between	
Aquifers in the District .....	8
Projected Surface Water Supplies within the District .....	8
Projected Total Demand for Water within the District .....	9
Water Supply Needs .....	9
Water Management Strategies.....	9
Management of Groundwater Supplies, and Actions, Procedures, Performance and Avoidance Necessary to Effectuate the Management Plan.....	9
Goals, Management Objectives, and Performance Standards.....	10
Goal 1.0 – Controlling & Preventing Waste of Groundwater - §36.1071(a)(1) .....	10
Goal 2.0 - Providing the Efficient Use of Groundwater - §36.1071(a)(1) .....	11
Goal 3.0 – Addressing Drought Conditions- §36.1071(a)(6) .....	11
Goal 4.0 – Addressing Conservation, Rainwater Harvesting, and Brush Control where appropriate and cost effective - §36.1071(a)(7) .....	12

Goal 5.0 – Addressing the Desired Future Conditions established under 31.108 - §36.1071(a)(8)	12
Goal 6.0 – Addressing Natural Resources Issues - §36.1071(a)(5)	13
Management Goals Determined Not-Applicable	14
Goal 7.0 – Addressing Precipitation Enhancement - §36.1071(a)(7)	14
Goal 8.0 – Addressing Recharge Enhancement - §36.1071(a)(7)	14
Goal 9.0 – Controlling and Preventing Subsidence - §36.1071(a)(7)	14
Goal 10.0 – Addressing Conjunctive Surface Water Management Issues - §36.1071(a)(4)	14
Appendix A – Administrative Documents; Adoption Meeting Notice, Meeting Agenda and Resolution	15
Appendix B – Estimated Historical Groundwater Use and 2022 State Water Plan Datasets: Glasscock Groundwater Conservation District	16
Appendix C – GAM Run 24-010: Glasscock Groundwater Conservation District Management Plan	17

## **District Mission**

The Glasscock Groundwater Conservation District strives to bring knowledge about conservation, preservation, and the efficient, beneficial, and wise use of water for the benefit of the citizens and economy of the District through monitoring and protecting the quality of the groundwater.

The District seeks to protect the groundwater quality and quantity within the District, pursuant to the powers and duties granted under Chapter 36, Subchapter D of the Texas Water Code. Any action taken by the District shall only be after full consideration and respect has been afforded to the individual property rights of all citizens of the District. The District also seeks to maintain groundwater ownership and rights of the landowners and their lessees as provided in the Texas Water Code §36.002.

## **Time Period For This Plan**

This plan becomes effective upon adoption by the District Board of Directors and approval by the Texas Water Development Board (TWDB) affirming the plan is administratively complete. This plan remains in effect for five years or until amendment or adoption of a new plan.

## **Statement Of Guiding Principles**

The primary concern of the residents of this area of the State regarding groundwater is the potential contamination of the groundwater from the vast amount of oil and gas production and the activities involved in the production of oil and gas. For this reason, the residents asked Representative Tom Craddick to introduce legislation to create this groundwater conservation district. The District recognizes that the groundwater resources of this region are of vital importance to the residents and that this resource must be managed and protected from contamination. The greatest threat to prevent the District from achieving the stated mission is from state mandates and agency bureaucrats who have no understanding of local conditions. A basic understanding of the aquifers and their hydrogeologic properties, as well as a quantification of resources is the foundation from which to build prudent planning measures. This management plan is intended as a tool to focus the thoughts and actions of those given the responsibility for the execution of District activities.

## **General Description**

The Glasscock Groundwater Conservation District (GCD) was created by Acts of the 67th Legislature (1981). In August 1981, the residents confirmed the District and voted to fund the

district operations through local property taxes. It became an active District in August 1981. On April 15, 1986, the District adopted Rules and By-Laws which became effective immediately and on February 21, 1989 the District adopted a management plan. With the adoption of these rules, the District implemented a well permitting and registration program. The District rules were amended on December 20, 2022. The current members of the Board of Directors are: Galen Schwartz; President, Allan Fuchs; Vice President, Bart Belew; Member, Russell Halfmann; Member and Lane Halfmann; Member. The District General Manager is Rhetta Hector and Rocio De Luna is the Administrative Assistant. The Glasscock GCD covers all of Glasscock County and a portion of Northwest Reagan County. The District's economy is based primarily on agriculture, and oil and gas production. The agricultural income is derived primarily from cotton, grain sorghum, wheat, alfalfa, pecans, as well as sheep, goats, and beef cattle production. Recreational hunting leases also contribute to the income of the area.

## **Regional Cooperation & Coordination**

### **West Texas Regional Groundwater Alliance**

Since 1988 the District has been involved in coordination of district activities with other GCD's managing the Edwards-Trinity (Plateau) Aquifer. In 1988, four groundwater conservation districts; Coke County UWCD, Glasscock County UWCD, Irion County WCD, and Sterling 3 County UWCD signed an original Cooperative Agreement. As new districts were created, they too signed the Cooperative Agreement. In the fall of 1996, the original Cooperative Agreement was redrafted, and the West Texas Regional Groundwater Alliance was created. Today, the regional alliance consists of eighteen locally created and locally funded groundwater conservation districts covering all or part of twenty-six counties, that encompass approximately 18.2 million acres or 28,368 square miles of West Central Texas. This West Texas region is as diverse as the State of Texas. Due to the diversity of this region, each member district provides its own unique programs to best serve its constituents. Current member districts are:

Coke Co. UWCD	Crockett Co. GCD	Glasscock GCD
Hickory UWCD # 1	Hill Country UWCD	Irion Co. WCD
Kimble Co. GCD	Lipan-Kickapoo WCD	Lone Wolf GCD
Menard Co. UWD	Middle Pecos GCD	Permian Basin UWCD
Plateau UWC & SD	Reeves Co. GCD	Santa Rita UWCD
Sterling Co. UWCD	Sutton Co. UWCD	Wes-Tex GCD

This regional alliance was created because the local districts have a common objective:

- a) to facilitate the conservation, preservation and protection of groundwater supplies,
- b) protection and enhancement of recharge,
- c) prevention of waste and pollution, and
- d) beneficial use of water and related resources.

Local districts monitor water-related activities which include but are not limited to the State's largest industries of farming, ranching and oil and gas production. The regional alliance provides coordination essential to the activities of these member districts as they monitor these activities in order to accomplish their objectives.

## **Regional Water Planning**

The District has been active in the Region F, Regional Water Planning Group meetings to provide input in developing and adopting the 2001, 2006, 2011, 2016, and 2021 regional plans. As the regional planning group moves toward adopting future Regional Plans the District will continue to participate in the planning process.

### **Groundwater Management Area**

Groundwater Management Area 7 covers all or part of thirty-three counties and includes twenty groundwater conservation districts. These GCD's manage groundwater resources at the local level in all or part of twenty-four counties within GMA 7 and surrounding areas. The District continues to actively participate in meetings and discussions to determine a feasible future desired condition of the aquifers within the management area and district.

### **Location And Extent**

The Glasscock GCD has an aerial extent of approximately 900 square miles or approximately 571,499 acres of land in Glasscock County and 65,350 acres in Northwest Reagan County. The total population of the District is approximately 1,400 people. There are no incorporated cities within the District boundaries. The two communities within the District are Garden City and St. Lawrence. Land use in the District is for agricultural purposes of which 151,000 acres is crop or farmland, 85,009 acres is improved pasture, and the balance of 400,840 acres is rangeland. The majority of the District is over the Edwards-Trinity (Plateau) Aquifer with exception of the northwest part of Glasscock County which is over the Ogallala Aquifer. The cropland is located primarily in the southern and northwest portions of the District, with the balance being in pasture and rangeland. Irrigation covers approximately 36,529 acres of the District's cropland. Of these acres, 26,529 are located in Glasscock County and 10,000 acres are located in Reagan County. Historically, the principal method of irrigation had been furrow irrigation. However, within recent years there has been a gradual trend to change to more highly efficient subsurface drip irrigation and low energy precision application (LEPA) center pivots. There are currently, approximately 28,400 acres of subsurface drip irrigation and 5,129 acres of LEPA center pivots within the District. The remaining 3,000 acres is furrow irrigation. The District is included in the Colorado River Basin, Region F Regional Water Planning Group and Groundwater Management Area 7.

### **Topography And Drainage**

The District is within what is known as the Permian Basin of Texas. Topographically, the area within the District is generally nearly level to undulating plain that slopes upward from the east to the west. The altitude of the land surface ranges from 2,300 feet above sea level in the eastern part of the District to about 2,750 feet above sea level in the western part of the District.

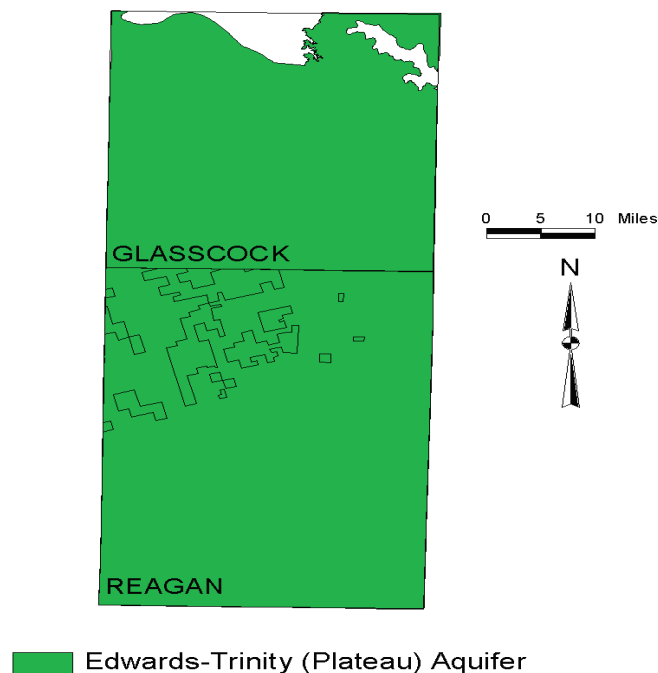
The Glasscock GCD lies within the Colorado River Basin. The North Concho River is a tributary of the Colorado River and is located in the northeast part of the District.

## Groundwater Resources

### Edwards-Trinity (Plateau)

The Edwards-Trinity (Plateau) Aquifer underlies the entire District except in the northwest portion of Glasscock County. Water from this aquifer is principally used for irrigation, rural, domestic, and livestock needs. This aquifer consists of saturated sediments of lower Cretaceous Epoch Trinity Group formations and overlying limestones and dolomite of the Comanche Peak, Edwards, and Georgetown formations. The Glen Rose Limestone is the primary unit of the Trinity Group in the southern part of the plateau and is replaced by the Antlers Sand north of the Glen Rose pinch out. Reported well yields range from 20 gal/min, where saturated thickness is thin, to more than 300 gal/min, within the District. Chemical quality of Edwards-Trinity (Plateau) water ranges from fresh to slightly saline. The water is typically hard and may vary widely in concentrations of dissolved solids made up mostly of calcium and bicarbonate. The salinity of the groundwater tends to increase toward the west. Certain areas have unacceptable levels of fluoride. Water levels have declined as a result of increased pumpage and the increase of harmful vegetation such as mesquite and prickly pear. The average decline has been approximately 20 feet since 1980. (See map below)

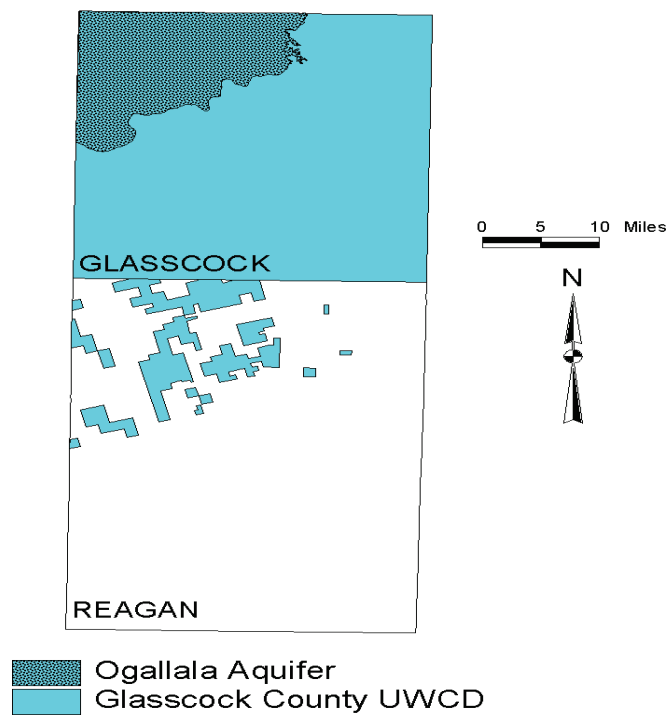
Extent of the Edwards-Trinity (Plateau)  
Aquifer in Glasscock County UWCD



## Ogallala Aquifer

The Ogallala Aquifer is located in northwest Glasscock County. It is composed primarily of sand, gravel, clay and silts deposited during the Tertiary Period. Water from this aquifer is principally used for irrigation, rural domestic, and livestock needs. Water yields from this aquifer are generally greater than 150 gal/min. The chemical quality of the water in the aquifer is generally fresh; however, higher levels of dissolved-solids and chloride concentrations can be found within the District. Water levels have fluctuated in this area due to several acres participating in the USDA Conservation Reserve Program being removed and put back into production. (See map below)

Extent of the Ogallala Aquifer  
in Glasscock County UWCD

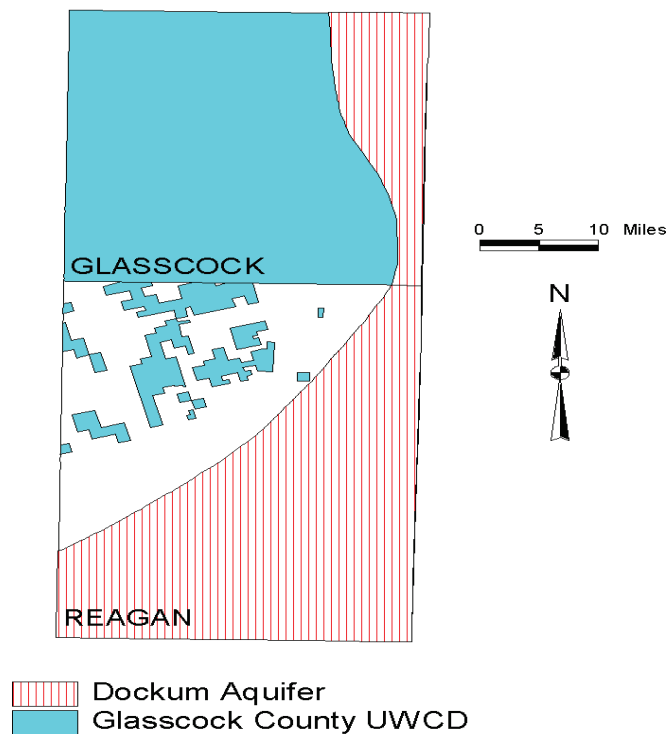


## Dockum Aquifer

The Dockum Aquifer is a minor aquifer found in the northwest part of the state. It includes the Santa Rosa Formation, the Tecovas Formation, the Trujillo Sandstone, and the Cooper Canyon Formation. The water quality in the aquifer is generally poor—with freshwater in outcrop areas in the east and brine in the western subsurface portions of the aquifer—and the water is very hard. Naturally occurring radioactivity from uranium present within the aquifer has resulted in gross alpha radiation in excess of the state's primary drinking water standard. Radium-226 and -228 also occur in amounts above acceptable standards. Groundwater from the aquifer is used for irrigation, municipal water supply, and oil field waterflooding operations.

The Dockum aquifer is located in the extreme eastern portion of the District. This aquifer is used principally for livestock needs. (See map below)

Extent of the Dockum Aquifer  
in Glasscock County UWCD



## **Lipan Aquifer**

The Lipan Aquifer is a minor aquifer found in parts of Coke, Concho, Glasscock, Irion, Runnels, Schleicher, Sterling, and Tom Green counties in west-central Texas. Groundwater in the alluvium ranges from fresh to slightly saline, containing between 350 and 3,000 milligrams per liter of total dissolved solids, and is very hard. The aquifer is primarily used for irrigation but also supports livestock and municipal, domestic, and manufacturing uses. Because of drought and heavy irrigation pumping in the late 1990s, water levels decreased significantly in some areas, and the aquifer could not be pumped through the entire irrigation season. In other areas, however, the aquifer could be pumped, but only at a reduced rate.

The aquifer explanations above were taken from the Texas Water Development Board's Report 380, Aquifers of Texas.

## **Technical District Information Required By Texas Administrative Code**

Texas Water Code § 36.001 defines modeled available groundwater as “the amount of water that the executive administrator determines may be produced on an average annual basis to achieve a desired future condition established under Section 36.108.”

The joint planning process set forth in Texas Water Code § 36.108 must be collectively conducted by all groundwater conservation districts within the same GMA. The District is a member of GMA 7. GMA 7 declared the Dockum and Lipan Aquifers as not relevant for regional planning purposes in the Sterling County Underground Water Conservation District and adopted DFCs for the Edwards/Trinity (Plateau) Aquifer on August 19, 2021. The adopted DFCs were forwarded to the TWDB for development of the MAG calculations. The submittal package for the DFCs can be found here:

[https://www.twdb.texas.gov/groundwater/management\\_areas/gma7.asp](https://www.twdb.texas.gov/groundwater/management_areas/gma7.asp)

A summary of the desired future conditions and the modeled available groundwater are summarized below.

Ogallala Aquifer: An average drawdown of 6 feet for the Ogallala Aquifer based on the GMA 7 Technical Memorandum 18-01.

Edwards/Trinity (Plateau) Aquifer: An average drawdown of 42 feet for the Edwards-Trinity (Plateau) aquifer based on the GMA 7 Technical Memorandum 18-01.

Dockum Aquifer: Not relevant for joint planning purposes within the boundaries of Glasscock Groundwater Conservation District

Lipan Aquifer: Not relevant for joint planning purposes within the boundaries of Glasscock Groundwater Conservation District.

Estimated Modeled Available Groundwater in ac/ft for the Ogallala Aquifer by district from GAM RUN 21-012 MAG.

	Year					
	2020	2030	2040	2050	2060	2070
Glasscock GCD	7,925	7,673	7,372	7,058	6,803	6,570

Estimated Modeled Available Groundwater in ac/ft for the Edwards/Trinity (Plateau) Aquifer by district from GAM RUN 21-012 MAG.

		Year					
		2020	2030	2040	2050	2060	2070
Glasscock GCD	Glasscock County	65,186	65,186	65,186	65,186	65,186	65,186
	Reagan County	40,835	40,835	40,835	40,835	40,835	40,835
	<b>TOTAL</b>	<b>106,021</b>	<b>106,021</b>	<b>106,021</b>	<b>106,021</b>	<b>106,021</b>	<b>106,021</b>

#### **Modeled Available Groundwater in the District**

Please refer to Appendix A

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

Please refer to Appendix B

#### **Annual Amount of Recharge from Precipitation to the Groundwater Resources within the District on an Annual Basis**

Please refer to GAM Run 24-010 in Appendix C

#### **Annual Volume of Water that Discharges from the Aquifer to Springs and Surface Water Bodies**

Please Refer to GAM Run 24-010 in Appendix C

#### **Estimate of the Annual Volume of Flow into the District, out of the District and Between Aquifers in the District**

Please refer to GAM Run 24-010 in Appendix C

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

No surface water management entities exist within the District. There are no surface water impoundments within the District except for livestock consumption. There are no surface water entities located within the District to coordinate the development of this plan.

Please refer to Appendix B.

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

Projected water demands do not exceed projected available groundwater in Glasscock County. Please refer to Appendix B

### **Water Supply Needs**

There are no water supply needs listed in the state water plan section of the TWDB Estimated Historical Water Use/2022 State water plan data report.

The residents of the District understand that groundwater supplies are limited and have modified farming and ranching techniques to match the availability of water. There are currently, approximately 28,400 acres of subsurface drip irrigation and 5,129 acres of LEPA center pivots within the District, with more acres going in every year. Efforts are being made by the residents of the District to use the available groundwater resources with maximum efficiency, while monitoring the quality of the groundwater to protect this resource for the years to come. The District has considered the water supply needs in Glasscock County and given the District's jurisdictional boundaries and the remote location; the District considers this to be not relevant. Please refer to Appendix B

### **Water Management Strategies**

The District continues to encourage conservation and reuse to meet the projected strategies in the 2021 Region F Water Plan. The water management plan strategies for the District include irrigation conservation, municipal conservation, mining conservation, and brush control. Please refer to Appendix B.

### **Management Of Groundwater Supplies, And Actions, Procedures, Performance, And Avoidance Necessary To Effectuate The Management Plan**

Since 1981, the District has and will continue to manage the supply of groundwater within the District, in order to conserve the resource while seeking to maintain the economic viability of all resource user groups, public and private. In consideration of the economic and cultural activities occurring within the District, the District will continue to identify and engage in such activities and practices, that if implemented, would result in preservation and protection of the groundwater. The observation network will continue to be reviewed and maintained in order to monitor changing conditions of groundwater within the District. The District will undertake investigations of the groundwater resources within the District and will make the results of investigations available to the public.

The District has, or will amend as necessary, rules to regulate groundwater withdrawals by means of spacing and/or production limits. The relevant factors to be considered in making the determination to grant a permit or limit groundwater withdrawal will include:

1. The purpose of the District and its rules;

2. The equitable conservation and preservation of the resource; and
3. The economic hardship resulting from granting or denying a permit or the terms prescribed by the rules.

In pursuit of the District's mission of preserving and protecting the resource, the District will enforce the terms and conditions of permits and the rules of the District by enjoining the permit holder in a court of competent jurisdiction, as provided for in TWC Chapter 36.102, if necessary.

The District shall treat all citizens with equality. Citizens may apply to the District for discretion in enforcement of the rules on grounds of adverse economic effect or unique local characteristics. In granting of discretion to any rule, the Board shall consider the potential for adverse effect on adjacent owners and aquifer conditions. The exercise of said discretion by the Board shall not be construed as limiting the power of the Board.

Current District rules are available at <https://www.glasscock-groundwater.org/rules-by-laws>.

### **Methodology for Tracking Progress**

The methodology that the District will use to trace its progress on an annual basis in achieving all of its management goals will be as follows:

- a) The District holds a regular board meeting for the purpose of conducting District business,
- b) Each month the District General Manager will present permit applications/registration forms to the Board for approval,
- c) inform the Board of drought severity within the District and,
- d) wasteful practices observed by District staff or reported to staff,

Additionally, the District General Manager will prepare and present an annual report to the Board of Directors on District performance in regard to achieving management goals and objectives for the preceding fiscal year. The report will include the number of instances each activity was engaged in during the year. The annual report will be maintained on file at the District office.

## **GOALS, MANAGEMENT OBJECTIVES And PERFORMANCE STANDARDS**

### **Goal 1.0 - Controlling and Preventing Waste of Groundwater §36.1071(a)(1)**

The District strives to minimize potential waste and contamination of groundwater by monitoring wasteful practices either observed by District staff or reported to District staff.

#### Management Objective

- 1.1 Each month, the District will investigate all identified wasteful practices within

two (2) working days of identification or complaint received.

Performance Standard

1.1a The District General Manager will report the number of wasteful practices identified and the average number of days District personnel took to respond or investigate after identification or complaint received.

1.1b District staff will provide the Board with findings, reports, and updates at monthly board meetings.

**Goal 2.0 Providing the Most Efficient Use of Groundwater §36.1071(a)(1)**

The District strives to gather groundwater data to improve the understanding of the aquifers and their hydrogeologic properties and to quantify this resource for prudent planning and efficient use.

Management Objective

2.1 Each year, the District will provide laser plane leveling equipment (based upon availability) to producers for better irrigation planning and contour farming free of charge.

Performance Standard

2.1a The District General Manager will present an Annual Report to the Board of Directors the number of times District's leveling equipment was loaned to producers.

**Goal 3.0 Addressing Drought Conditions §36.1071(a)(6)**

The District's lack of surface water supplies and semi-arid climate conditions results in drought monitoring being an important component of informed management. The District strives to remain aware of ever-changing climatic conditions.

Management Objective

3.1 The District will monitor the Palmer Drought Severity Index (PDSI) by Texas Climatic Divisions. <https://www.waterdatafortexas.org/drought>

Performance Standard

3.1a The District staff will report the PDSI findings and actions to the Board of Directors at least quarterly.

Management Objective

3.2 Management Objective The District will maintain a rainfall monitor network.

Performance Standard

3.2a The District staff will report the rainfall monitoring network data to the Board of Directors at least quarterly.

**Goal 4.0 Addressing Conservation, Rainwater Harvesting, and Brush Control where appropriate and cost effective. §36.1071(a)(7)**

The District strives to promote water management strategies recommended in the 2021 Region F Regional Water Plan that have the potential to promote local groundwater supplies and maintain financial responsibility.

Management Objective: Conservation

- 4.1 The District will continue to be a source for informational materials, literature and programs to improve public awareness of efficient use, wasteful practices and conservation measures.

Performance Standard: Conservation

- 4.1a The District staff will provide information to area residents at least once a year.

<http://www.savetexaswater.org>

- 4.1b The District General Manager will present an Annual Report to the Board of Directors the number of times the District provided information to area residents.

Management Objective: Rainwater Harvesting

- 4.3 District staff will provide information to area residents at least once a year.

Performance Standards: Rainwater Harvesting

- 4.3a The District General Manager will present an Annual Report to the Board of Directors the number of times the District provided information to area residents.

Management Objective: Brush Control

- 4.4 Provide and distribute literature on brush control to area residents.

Performance Standards: Brush Control

- 4.4a District staff will provide information to area residents at least once a year.
- 4.4b The District General Manager will present an Annual Report to the Board of Directors the number of times the District provided information to area residents.

**Goal 5.0 Addressing the Desired Future Conditions established under §36.108 §36.1071(a)(8)**

The District strives to gather data to improve the understanding of the aquifers and their hydrogeologic properties and in the establishment and monitoring of achievement of desired future conditions.

Management Objective

5.1 The District has established an Observation Well Program to monitor water levels and evaluate whether the average change in water well levels is in conformance with the Desired Future Conditions adopted by the District. The District will estimate total annual groundwater production for each aquifer based on water use reports, estimated exempt use and other relevant information, and compare these production estimates to the MAGs. Each year, the District will measure, record, and accumulate a historic record of water levels in the Observation Well Program.

The DFCs for GMA 7 can be seen here:

[2021 Joint Groundwater Planning | Texas Water Development Board](#)

#### Performance Standards

5.1a The District will maintain files and records including the number of water levels measured and static level information on the District Observation Well Program.

The District will record the water level data and average annual change in water levels for each aquifer and compare them to the DFCs.

5.1b Record the total estimated annual productions for each aquifer and compare these amounts to the MAG. The District General Manager will present an Annual Report to the Board of Directors with the Observation Well Program measurements.

### **Goal 6.0 Addressing Natural Resource Issues**

**§36.1071(a)(5)**

The District strives recognizes the reliance of other natural resources on groundwater supplies.

#### Management Objective

6.1 District staff will submit all requested water quality samples within 7 business days from receipt.

#### Performance Standards

6.1a The District General Manager will present an Annual Report to the Board of Directors the number of results that were submitted to the laboratory for water quality testing in the District's annual report.

#### Management Objective

6.2 This District will inspect any abandoned wells discovered by District staff or reported to the District and send a letter to the landowner requiring the well be covered or plugged in accordance with state laws.

#### Performance Standards

6.2a The District General Manager will present an Annual Report to the Board of Directors the number of abandoned well enforcement letters mailed out in the District's annual report.

#### Management Objective

6.3 The District will require all wells drilled for oil and gas operations be permitted or

registered, including meeting the spacing standards if applicable.

#### Performance Standards

6.3a The District General Manager will present an Annual Report to the Board of Directors the number wells drilled for this purpose in the District's annual report.

### **MANAGEMENT GOALS DETERMINED NOT APPLICABLE**

#### **Goal 7.0 Addressing Precipitation Enhancement**

**§36.1071(a)(7)**

The Board of Directors has determined precipitation enhancement not to be cost-effective for the District. Therefore, this goal is not applicable to the operations of the District.

#### **Goal 8.0 Addressing Recharge Enhancement**

**§36.1071(a)(7)**

The diverse topography, and limited knowledge of any specific recharge sites makes any type of recharge enhancement project economically unfeasible. According to the TWDB Statewide Survey of ASR and AR Suitability, the Glasscock Groundwater Conservation District has a suitability rating that ranges from *no need identified, less suitable or moderately suitable*( <https://arcg.is/0zPHir0> ). This management goal is not applicable to the operation of the District.

#### **Goal 9.0 Controlling and Preventing Subsidence**

**§36.1071(a)(7)**

The rigid geologic framework of the region precludes significant subsidence from occurring, as identified in the *Identification of the Vulnerability of the Major and Minor Aquifers of Texas to Subsidence with Regard to Groundwater Pumping – TWDB Contract Number 1648302062 report by LRE Water*

(<https://www.twdb.texas.gov/groundwater/models/research/subsidence/subsidence.asp>). In Table 1.4 (page 28 of 434) the Edwards- Trinity aquifer is considered low risk as a whole. Tables 4.7 and 4.18 (page 80 & 81 of 434) identifies the risk for well locations in Glasscock & Reagan Counties to be a low subsidence risk for the aquifer as a whole. As a result, this goal is not applicable to the operations of the District.

#### **Goal 10.0 Addressing Conjunctive Surface Water Management Issues**

**§36.1071(a)(4)**

No surface water management entities exist within the District. There are no surface water impoundments within the District except for livestock consumption. The Glasscock GCD has no jurisdiction over surface water. The groundwater within the district is used primarily for irrigated agriculture, rural domestic, livestock and petroleum drilling and exploration needs. This goal is not applicable to the operations of the District.

## Appendix A

Administrative Documents  
Adoption Meeting Notice  
Meeting Agenda  
Resolution

**NOTICE OF MEETING OF THE GOVERNING BODY FOR THE  
GLASSCOCK GROUNDWATER CONSERVATION DISTRICT**

Notice is hereby given that the Board of Directors for the Glasscock Groundwater Conservation District will meet in a PUBLIC HEARING on **Tuesday, May 20<sup>th</sup>, 2025 at 9:00 a.m.** in the District Office of Glasscock Groundwater Conservation District, located at 132 N. Main in Garden City, Texas. At such time the Board of Directors will discuss and may take action on any items on this agenda it may determine would be appropriate, to-wit:

**PUBLIC HEARING NOTICE**

The Glasscock Groundwater Conservation District will hold a public hearing at 9:00 am on May 20<sup>th</sup>, 2025, in the District office located at 132 N. Main, Garden City, Texas to accept public comment on the proposed 2024-2029 GGCD Management Plan. Copies of the proposed 2024-2029 GGCD Management Plan can be found at the District home page at <https://www.glasscock-groundwater.org> or a by contacting the District office at (432)354-2430 or emailing the District at [glasscockgroundwater@yahoo.com](mailto:glasscockgroundwater@yahoo.com). Written comments will be received through Friday, May 16, 2025 by mail, email ([glasscockgroundwater@yahoo.com](mailto:glasscockgroundwater@yahoo.com)) or hand delivery. The mailing address is: PO Box 208, Garden City, TX 79739. The physical address for hand delivery is: 132 N. Main Street, Garden City, TX. The public may provide oral comments at the May 20, 2025 public hearing.

**PUBLIC HEARING AGENDA**


- 1) Call to Order.
- 2) Present the proposed 2024-2029 GGCD Management Plan.
- 3) Accept comments on 2024-2029 GGCD Management Plan.
- 4) Adjournment.

I, the undersigned authority, do hereby certify that the above NOTICE OF MEETING of the Board of Directors of the Glasscock Groundwater Conservation District is a true and correct copy of said Notice. I have posted a true and correct copy of said Notice on the front entrance of Glasscock Groundwater Conservation District Office, located at 132 N. Main, Garden City, Texas and said Notice posted on the **7<sup>th</sup> day of May 2025**, and remained posted continuously for at least 72 hours immediately preceding the day of said meeting; a true and correct copy of said Notice was furnished to the Glasscock and Reagan County Clerks, in which the above named political subdivision is located.


Dated this the **7<sup>th</sup> day of May 2025**.

Glasscock Groundwater Conservation District

By: \_\_\_\_\_

  
Rhett Hector  
General Manager

FILED

May 7 2025  


County Clerk Glasscock County, Tex.

by: \_\_\_\_\_ Deputy

**NOTICE OF MEETING OF THE GOVERNING BODY FOR THE  
GLASSCOCK GROUNDWATER CONSERVATION DISTRICT**

Notice is hereby given that the Board of Directors for the Glasscock Groundwater Conservation District will meet in a PUBLIC HEARING on *Tuesday, May 20<sup>th</sup>, 2025* at 9:00 a.m. in the District Office of Glasscock Groundwater Conservation District, located at 132 N. Main in Garden City, Texas. At such time the Board of Directors will discuss and may take action on any items on this agenda it may determine would be appropriate, to-wit:

**PUBLIC HEARING NOTICE**

The Glasscock Groundwater Conservation District will hold a public hearing at 9:00 am on May 20<sup>th</sup>, 2025, in the District office located at 132 N. Main, Garden City, Texas to accept public comment on the proposed 2024-2029 GGCD Management Plan. Copies of the proposed 2024-2029 GGCD Management Plan can be found at the District home page at <https://www.glasscock-groundwater.org> or a by contacting the District office at (432)354-2430 or emailing the District at [glasscockgroundwater@yahoo.com](mailto:glasscockgroundwater@yahoo.com). Written comments will be received through Friday, May 16, 2025 by mail, email ([glasscockgroundwater@yahoo.com](mailto:glasscockgroundwater@yahoo.com)) or hand delivery. The mailing address is: PO Box 208, Garden City, TX 79739. The physical address for hand delivery is: 132 N. Main Street, Garden City, TX. The public may provide oral comments at the May 20, 2025 public hearing.

**PUBLIC HEARING AGENDA**

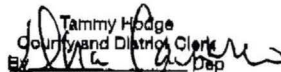
- 1) Call to Order.
- 2) Present the proposed 2024-2029 GGCD Management Plan.
- 3) Accept comments on 2024-2029 GGCD Management Plan.
- 4) Adjournment.

I, the undersigned authority, do hereby certify that the above NOTICE OF MEETING of the Board of Directors of the Glasscock Groundwater Conservation District is a true and correct copy of said Notice. I have posted a true and correct copy of said Notice on the front entrance of Glasscock Groundwater Conservation District Office, located at 132 N. Main, Garden City, Texas and said Notice posted on the 7<sup>th</sup> day of May 2025, and remained posted continuously for at least 72 hours immediately preceding the day of said meeting; a true and correct copy of said Notice was furnished to the Glasscock and Reagan County Clerks, in which the above named political subdivision is located.

Dated this the 7<sup>th</sup> day of May 2025.

FILED at 10:17 AM  
Reagan County

MAY 07 2025

Tammy Hodge  
County and District Clerk  
By 

Glasscock Groundwater Conservation District

By   
Rhett Hector  
General Manager

## GLASSCOCK GROUNDWATER CONSERVATION DISTRICT

Notice is hereby given that the Board of Directors for the Glasscock Groundwater Conservation District will meet in a REGULAR SESSION on **Tuesday May 20<sup>th</sup>, 2025 at 9:00 a.m.** in the District Office of Glasscock Groundwater Conservation District, located at 132 N. Main in Garden City, Texas. At such time the Board of Directors will discuss and may take action on any items on this agenda it may determine would be appropriate, to-wit:

### REGULAR MEETING AGENDA

- 1) Call to Order.
- 2) Public Comment.
- 3) Read and Consider Minutes from the March 18, 2025, April 15, 2025 public hearing, and April 15, 2025 regular meeting.
- 4) Approve March 2025 and April 2025 financial statements.
- 5) Pay May 2025 bills.
- 6) The Board will review & consider approval of water well permits.
- 7) Discussion and possible action to adopt the proposed 2024-2029 Management Plan.
- 8) Review of the Palmer Drought Severity Index for April 2025 and May 2025.
- 9) Review of the District's Rain Gauge Network Data.
- 10) Number of wasteful practices for the month of April 2025 and May 2025.
- 11) Review of General Manager Report.
- 12) Any other items pertinent to District business.
- 13) Adjournment.

In compliance with the Texas Open Meetings Act, Chapter 551, the Glasscock Groundwater Conservation District Board may meet in executive session on any of the above agenda items for consultation concerning: attorney- client matters and consultations (Section 551.071) and personnel matters (Section 551.074). Any subject discussed in executive session may be subject to action during any open meeting.

I, the undersigned authority, do hereby certify that the above NOTICE OF MEETING of the Board of Directors of the Glasscock Groundwater Conservation District is a true and correct copy of said Notice. I have posted a true and correct copy of said Notice on the front entrance of Glasscock Groundwater Conservation District Office, located at 132 N. Main, Garden City, Texas and said Notice posted on the **14<sup>th</sup> day of May 2025**, and remained posted continuously for at least 72 hours immediately preceding the day of said meeting; a true and correct copy of said Notice was furnished to the Glasscock and Reagan County Clerks, in which the above named political subdivision is located.

Dated this the **14<sup>th</sup> day of May 2025**.

Glasscock Groundwater Conservation District

By:   
Rhett Hector  
General Manager

FILED  
REBECCA KATLA  
COUNTY CLERK GLASSCOCK CO. TX

2025 MAY 14 A 9:40

BY DEPUTY 

**GLASSCOCK GROUNDWATER CONSERVATION DISTRICT**

Notice is hereby given that the Board of Directors for the Glasscock Groundwater Conservation District will meet in a **REGULAR SESSION** on **Tuesday May 20<sup>th</sup>, 2025 at 9:00 a.m.** in the District Office of Glasscock Groundwater Conservation District, located at 132 N. Main in Garden City, Texas. At such time the Board of Directors will discuss and may take action on any items on this agenda it may determine would be appropriate, to-wit:

**REGULAR MEETING AGENDA**

- 1) Call to Order.
- 2) Public Comment.
- 3) Read and Consider Minutes from the March 18, 2025, April 15, 2025 public hearing, and April 15, 2025 regular meeting.
- 4) Approve March 2025 and April 2025 financial statements.
- 5) Pay May 2025 bills.
- 6) The Board will review & consider approval of water well permits.
- 7) Discussion and possible action to adopt the proposed 2024-2029 Management Plan.
- 8) Review of the Palmer Drought Severity Index for April 2025 and May 2025.
- 9) Review of the District's Rain Gauge Network Data.
- 10) Number of wasteful practices for the month of April 2025 and May 2025.
- 11) Review of General Manager Report.
- 12) Any other items pertinent to District business.
- 13) Adjournment.

In compliance with the Texas Open Meetings Act, Chapter 551, the Glasscock Groundwater Conservation District Board may meet in executive session on any of the above agenda items for consultation concerning: attorney-client matters and consultations (Section 551.071) and personnel matters (Section 551.074). Any subject discussed in executive session may be subject to action during any open meeting.

I, the undersigned authority, do hereby certify that the above NOTICE OF MEETING of the Board of Directors of the Glasscock Groundwater Conservation District is a true and correct copy of said Notice. I have posted a true and correct copy of said Notice on the front entrance of Glasscock Groundwater Conservation District Office, located at 132 N. Main, Garden City, Texas and said Notice posted on the 14<sup>th</sup> day of May 2025, and remained posted continuously for at least 72 hours immediately preceding the day of said meeting; a true and correct copy of said Notice was furnished to the Glasscock and Reagan County Clerks, in which the above named political subdivision is located.

Dated this the 14<sup>th</sup> day of May 2025.

Glasscock Groundwater Conservation District

By: 

Rhett Hector  
General Manager

FILED at 9:29 A.M.  
Reagan County

MAY 14 2025

By:   
Tammy Hodge  
County and District Clerk

GLASSCOCK GROUNDWATER  
CONSERVATION DISTRICT

May 20, 2025

Board of Directors Public Hearing

9:00 a.m.

AGENDA

- 1) Call to Order.
- 2) Present the 2024-2029 Management Plan.
- 3) Accept comments on the 2024-2029 Management Plan.
- 4) Adjournment.

ORDER OF BUSINESS

Agenda

Public Comments

Adjourn

GLASSCOCK GROUNDWATER  
CONSERVATION DISTRICT  
May 20, 2025  
Board of Directors Regular Meeting  
9:00 a.m.

AGENDA

- 1) Call to Order.
- 2) Public Comment.
- 3) Read and Consider Minutes from the March 18, 2025, April 15, 2025 public hearing, and April 15, 2025 regular meeting.
- 4) Approve March 2025 and April 2025 financial statements.
- 5) Pay May 2025 bills.
- 6) The Board will review & consider approval of water well permits.
- 7) Discussion and possible action to adopt the proposed 2024-2029 Management Plan.
- 8) Review of the Palmer Drought Severity Index for April 2025 and May 2025.
- 9) Review of the District's Rain Gauge Network Data.
- 10) Number of wasteful practices for the month of April 2025 and May 2025.
- 11) Review of General Manager Report.
- 12) Any other items pertinent to District business.
- 13) Adjournment.

ORDER OF BUSINESS

Minutes  
Scheduled Business  
Financial Statement  
Bills  
Other Business

# GLASSCOCK GROUNDWATER CONSERVATION DISTRICT

GALEN SCHWARTZ, PRESIDENT  
ALLAN FUCHS, V-PRESIDENT  
LANE HALFMANN, MEMBER  
RUSSELL HALFMANN, MEMBER  
BART BELEW, MEMBER  
RHETTA HECTOR, GENERAL MANAGER  
ROCIO DE LUNA, ADMIN. ASSISTANT

---

P.O. BOX 208 132 N. MAIN GARDEN CITY, TEXAS 79739 PHONE (432) 354-2430 FAX (432) 354-2322  
E-MAIL: [glasscockgroundwater@yahoo.com](mailto:glasscockgroundwater@yahoo.com)

May 21, 2025

Region F Water Planning Group  
Colorado River Municipal Water District  
400 E. 24<sup>th</sup> Street  
Big Spring, TX 79720

RE: Glasscock Groundwater Conservation District Management Plan; Adopted May 20, 2025

Chapter 36, Texas Water Code, requires groundwater conservation districts to adopt a management plan addressing issues concerning groundwater management in coordination with surface water management entities and regional planning. Therefore, please go to <https://www.glasscock-groundwater.org/> for a copy of the newly adopted Glasscock Groundwater Conservation District 2024-2029 Management Plan for review.

If you have any questions or need further information on this management plan, please contact me at (432) 354-2430 or by email at [glasscockgroundwater@yahoo.com](mailto:glasscockgroundwater@yahoo.com)

Thank you,



Rhetta Hector  
General Manager

## Appendix B

### Estimated Historical Groundwater Use and 2022 State Water Plan Datasets: Glasscock Groundwater Conservation District

# TWDB Estimated Historical Groundwater Use and 2022 State Water Plan Datasets

## Glasscock Groundwater Conservation District

Texas Water Development Board  
Groundwater Division  
Groundwater Technical Assistance Department  
stephen.allen@twdb.texas.gov  
(512) 463-7317  
November 18, 2024

### **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 Grayson Dowlearn, grayson.dowlearn@twdb.texas.gov, (512) 475-1552.

## **DISCLAIMER:**

Data presented in these tables are the most up to date WUS and SWP data available as of 11/18/2024. 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 Sabrina Anderson, (sabrina.anderson@twdb.texas.gov or 512-936-0886).

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

# Estimated Historical Water Use

## TWDB Historical Water Use Survey (WUS) Data

### GLASSCOCK COUNTY

100% (multiplier)

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2021	GW	126	213	1,571	0	36,148	93	38,151
	SW	0	0	0	0	0	23	23
2020	GW	125	21	2,734	0	40,924	96	43,900
	SW	0	0	0	0	0	24	24
2019	GW	128	16	9,316	0	39,239	96	48,795
	SW	0	0	0	0	0	24	24
2018	GW	126	16	8,020	0	36,551	96	44,809
	SW	0	0	0	0	0	24	24
2017	GW	124	25	6,536	0	39,419	93	46,197
	SW	0	0	0	0	0	23	23
2016	GW	122	35	2,619	0	37,376	90	40,242
	SW	0	0	0	0	0	23	23
2015	GW	118	38	3,127	0	25,274	90	28,647
	SW	0	0	0	0	0	22	22
2014	GW	128	25	3,596	0	51,077	88	54,914
	SW	0	0	0	0	0	22	22
2013	GW	143	3	2,485	0	49,582	99	52,312
	SW	0	0	0	0	0	25	25
2012	GW	153	3	1,840	0	45,197	108	47,301
	SW	0	0	0	0	0	27	27

# Projected Surface Water Supplies

## TWDB 2022 State Water Plan Data

### GLASSCOCK COUNTY

100% (multiplier)

All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
F	Livestock, Glasscock	Colorado	Colorado Livestock Local Supply	38	38	38	38	38	38
F	Mining, Glasscock	Colorado	Colorado Other Local Supply	106	106	106	106	106	106
Sum of Projected Surface Water Supplies (acre-feet)				144	144	144	144	144	144

### REAGAN COUNTY

8.22% (multiplier)

All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
F	Livestock, Reagan	Colorado	Colorado Livestock Local Supply	5	5	5	5	5	5
F	Mining, Reagan	Colorado	Colorado Other Local Supply	15	15	15	15	15	15
Sum of Projected Surface Water Supplies (acre-feet)				20	20	20	20	20	20

# 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.

### GLASSCOCK COUNTY

100% (multiplier)

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
F	County-Other, Glasscock	Colorado	161	165	160	160	159	159
F	Irrigation, Glasscock	Colorado	51,254	51,254	51,254	51,254	51,254	51,254
F	Livestock, Glasscock	Colorado	147	147	147	147	147	147
F	Manufacturing, Glasscock	Colorado	25	33	33	33	33	33
F	Mining, Glasscock	Colorado	5,900	5,900	4,500	3,200	2,100	1,500
Sum of Projected Water Demands (acre-feet)			57,487	57,499	56,094	54,794	53,693	53,093

### REAGAN COUNTY

8.22% (multiplier)

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
F	Big Lake	Colorado	730	795	834	877	906	928
F	County-Other, Reagan	Colorado	6	6	6	7	7	7
F	Irrigation, Reagan	Colorado	1,811	1,811	1,811	1,811	1,811	1,811
F	Livestock, Reagan	Colorado	14	14	14	14	14	14
F	Livestock, Reagan	Rio Grande	1	1	1	1	1	1
F	Mining, Reagan	Colorado	810	810	589	336	130	46
F	Mining, Reagan	Rio Grande	61	61	44	25	10	3
Sum of Projected Water Demands (acre-feet)			3,433	3,498	3,299	3,071	2,879	2,810

Estimated Historical Water Use and 2022 State Water Plan Dataset:

Glasscock Groundwater Conservation District

November 18, 2024

Page 5 of 7

# Projected Water Supply Needs

## TWDB 2022 State Water Plan Data

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

### GLASSCOCK COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
F	County-Other, Glasscock	Colorado	0	0	0	0	0	0
F	Irrigation, Glasscock	Colorado	0	0	0	0	0	0
F	Livestock, Glasscock	Colorado	0	0	0	0	0	0
F	Manufacturing, Glasscock	Colorado	0	0	0	0	0	0
F	Mining, Glasscock	Colorado	0	0	0	0	0	0
Sum of Projected Water Supply Needs (acre-feet)			0	0	0	0	0	0

### REAGAN COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
F	Big Lake	Colorado	0	0	0	0	0	0
F	County-Other, Reagan	Colorado	0	0	0	0	0	0
F	Irrigation, Reagan	Colorado	0	0	0	0	0	0
F	Livestock, Reagan	Colorado	0	0	0	0	0	0
F	Livestock, Reagan	Rio Grande	0	0	0	0	0	0
F	Mining, Reagan	Colorado	0	0	0	263	2,963	4,063
F	Mining, Reagan	Rio Grande	0	0	0	0	0	0
Sum of Projected Water Supply Needs (acre-feet)			0	0	0	0	0	0

# Projected Water Management Strategies

## TWDB 2022 State Water Plan Data

### GLASSCOCK COUNTY

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
<b>Irrigation, Glasscock, Colorado (F)</b>							
Irrigation Conservation - Glasscock County	DEMAND REDUCTION [Glasscock]	2,050	2,050	2,050	2,050	2,050	2,050
		<b>2,050</b>	<b>2,050</b>	<b>2,050</b>	<b>2,050</b>	<b>2,050</b>	<b>2,050</b>
<b>Mining, Glasscock, Colorado (F)</b>							
Mining Conservation - Glasscock County	DEMAND REDUCTION [Glasscock]	248	248	189	134	88	63
		<b>248</b>	<b>248</b>	<b>189</b>	<b>134</b>	<b>88</b>	<b>63</b>
<b>Sum of Projected Water Management Strategies (acre-feet)</b>		<b>2,298</b>	<b>2,298</b>	<b>2,239</b>	<b>2,184</b>	<b>2,138</b>	<b>2,113</b>

### REAGAN COUNTY

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
<b>Big Lake, Colorado (F)</b>							
Municipal Conservation - Big Lake	DEMAND REDUCTION [Reagan]	10	12	12	13	13	14
		<b>10</b>	<b>12</b>	<b>12</b>	<b>13</b>	<b>13</b>	<b>14</b>
<b>Irrigation, Reagan, Colorado (F)</b>							
Irrigation Conservation - Reagan County	DEMAND REDUCTION [Reagan]	1,102	2,203	3,305	3,305	3,305	3,305
Weather Modification	Weather Modification [Atmosphere]	1,869	1,869	1,869	1,869	1,869	1,869
		<b>2,971</b>	<b>4,072</b>	<b>5,174</b>	<b>5,174</b>	<b>5,174</b>	<b>5,174</b>
<b>Mining, Reagan, Colorado (F)</b>							
Mining Conservation - Reagan County	DEMAND REDUCTION [Reagan]	414	414	300	58	22	7
		<b>414</b>	<b>414</b>	<b>300</b>	<b>58</b>	<b>22</b>	<b>7</b>
<b>Mining, Reagan, Rio Grande (F)</b>							
Mining Conservation - Reagan County	DEMAND REDUCTION [Reagan]	31	31	23	4	2	1
		<b>31</b>	<b>31</b>	<b>23</b>	<b>4</b>	<b>2</b>	<b>1</b>
<b>Sum of Projected Water Management Strategies (acre-feet)</b>		<b>3,426</b>	<b>4,529</b>	<b>5,509</b>	<b>5,249</b>	<b>5,211</b>	<b>5,196</b>

Estimated Historical Water Use and 2022 State Water Plan Dataset:

Glasscock Groundwater Conservation District

November 18, 2024

Page 7 of 7

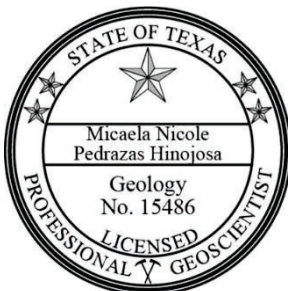
## Appendix C

GAM Run 24-010

Glasscock Groundwater Conservation District  
Management Plan

# Glasscock Groundwater Conservation District

## Part 2 – Data Required for Management Plan GAM Run 24-010



*Micaela*  
10/28/24

Micaela Pedrazas, P.G.  
Texas Water Development Board  
Groundwater Modeling Department  
October 28, 2024

## INTRODUCTION

Texas Water Code § 36.1071(h), 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 Glasscock Groundwater Conservation District in two parts. This report constitutes part 2, the required groundwater availability modeling information, which includes:

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

This report replaces the results of GAM Run 18-022 (Wade, 2018). We used two groundwater availability models for the Glasscock Groundwater Conservation District. Information for the [Dockum and Ogallala aquifers](#) is from is from version 1.01 of the groundwater availability model for High Plains Aquifer System (Deeds and Jigmond, 2015). Information for the [Edwards-Trinity \(Plateau\) Aquifer](#) is from the alternative one-layer groundwater model for the Edwards-Trinity (Plateau) and Pecos Valley aquifers (Hutchison and others, 2011).

The groundwater management plan for the Glasscock Groundwater Conservation District should be adopted by the district on or before December 18, 2024 and submitted to the Executive Administrator of the TWDB on or before January 17, 2025. The current management plan for the Glasscock Groundwater Conservation District expires on March 18, 2025.

## METHODS

In accordance with the provisions of the Texas Water Code § 36.1071 (h), the groundwater availability models mentioned above were used to estimate information for the Glasscock Groundwater Conservation District management plan. The average annual water budget values for recharge, surface-water outflow, inflow to the district, outflow from the district, and the flow between aquifers within the district are summarized in this report.

Values may differ from the previous report as a result of routine updates to the spatial grid file used to define county, groundwater conservation district, and aquifer boundaries, which can impact the calculated water budget values. Additionally, the approach used for analyzing model results is reviewed during each update and may have been refined to better delineate groundwater flows. Finally, results may differ due to the use of more recent models or techniques.

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

If the Glasscock Groundwater Conservation District determines that the district boundaries used in the assessment do not reflect current conditions after reviewing the figures, please notify the TWDB Groundwater Modeling Department at your earliest convenience.

The flow components presented in this report do not represent the full groundwater budget. If additional inflow and outflow information would be helpful for planning purposes, the district may submit a request in writing to the [TWDB Groundwater Modeling Department](#) for the full groundwater budget.

## **Models and Aquifers**

### ***Groundwater availability model for the High Plains Aquifer System***

- Version 1.01 (Deeds and Jigmond, 2015)
- The model was run with MODFLOW-NWT (Niswonger and others, 2011).
- Water budgets were extracted for the historical calibration period (1980 through 2012) using ZONEBUDGET Version 3.01 (Harbaugh, 2009).
- This model was used to analyze the following aquifers:
  - [Dockum Aquifer](#)
  - [Ogallala Aquifer](#)

### ***Alternative one-layer groundwater model for the Edwards-Trinity (Plateau) and Pecos Valley aquifers***

- Version 1.01 (Hutchison and others, 2011)
- The model was run with MODFLOW-2000 (Harbaugh and others, 2000).
- Water budgets were extracted for the historical calibration period (1980 through 2005) using ZONEBUDGET Version 3.01 (Harbaugh, 2009).
- This model was used to analyze the following aquifer:
  - [Edwards-Trinity \(Plateau\) Aquifer](#)

For more information on model parameters, packages used to simulate groundwater flow, other model layers, or model assumptions, please see the associated model reports linked in the References section.

---

## RESULTS

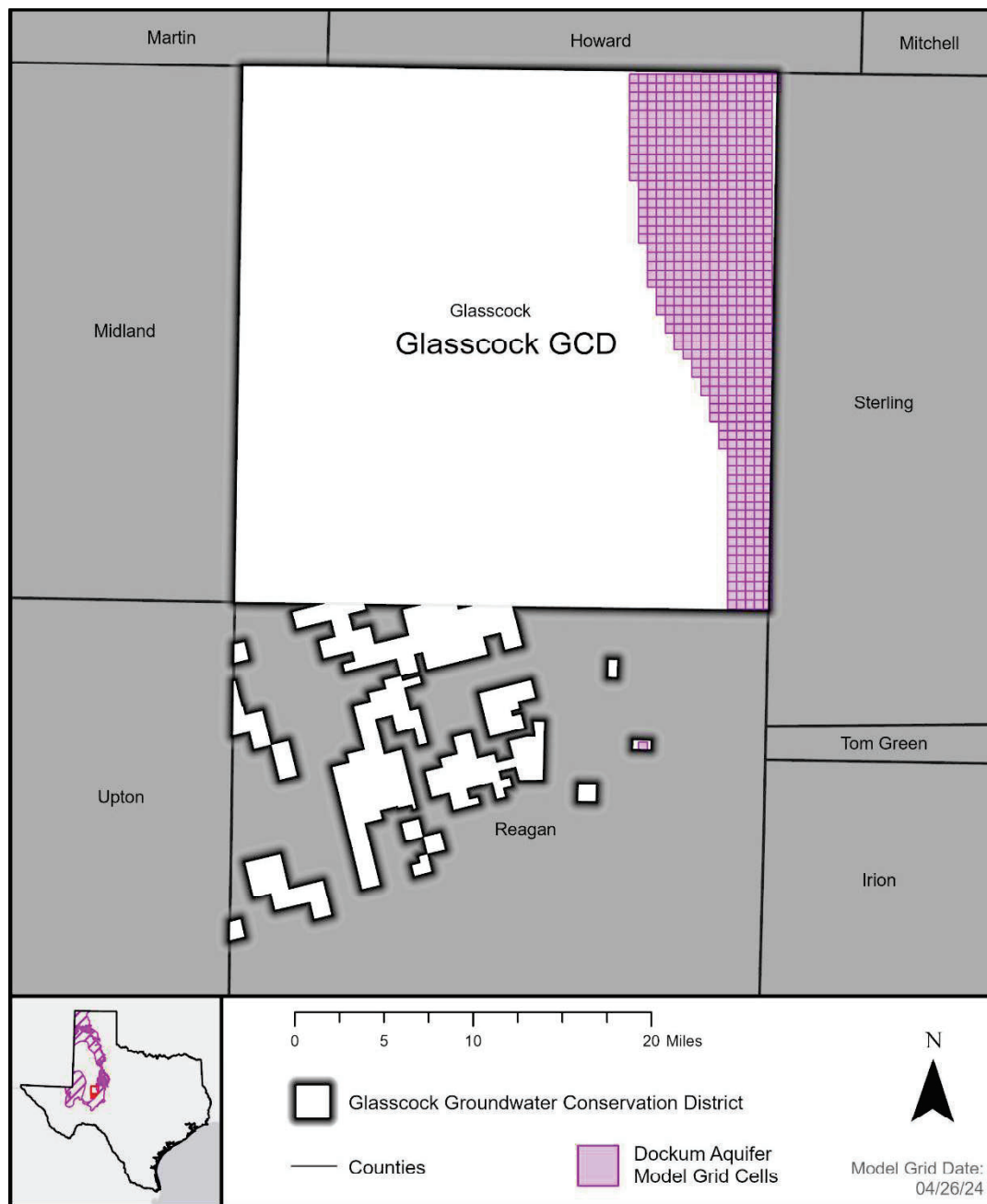
A groundwater budget summarizes the amount of water entering and leaving the aquifer according to the groundwater availability model. Selected groundwater budget components listed below were extracted from the groundwater availability model results for the [Dockum, Edwards-Trinity \(Plateau\) and Ogallala aquifers](#) located within Glasscock Groundwater Conservation District:

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

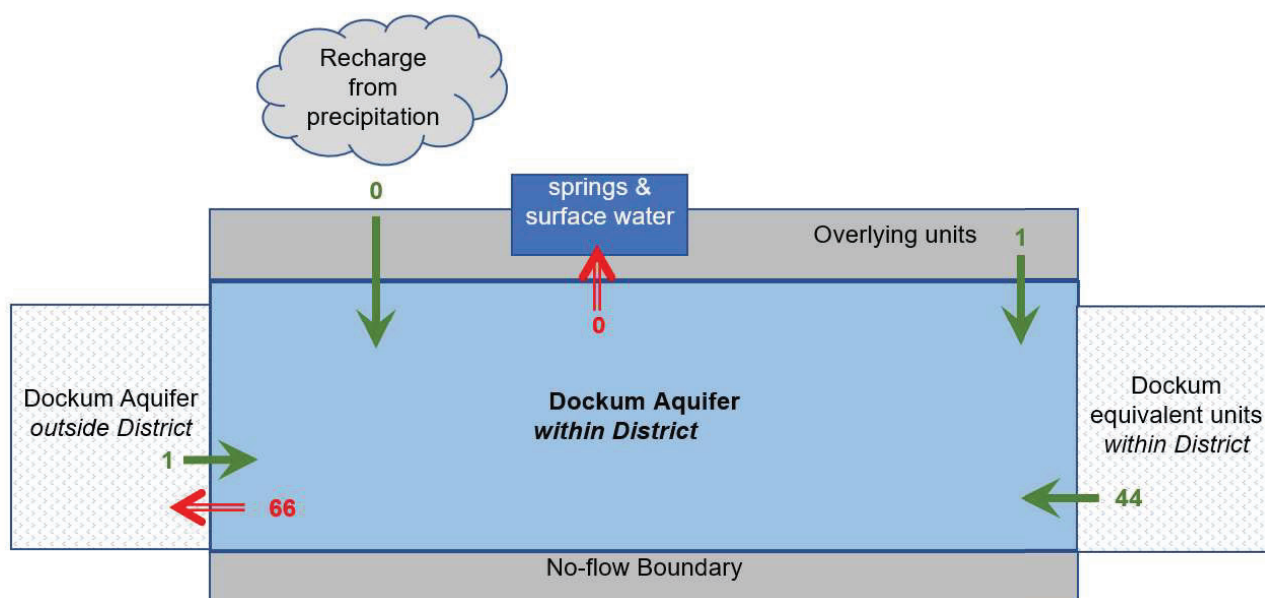
The information needed for the district's management plan is summarized in Tables 1 through 3. Figures 1, 3, and 5 show the area of the model from which the values in Tables 1 through 3 were extracted. Figures 2, 4, and 6 provide a generalized diagram of the groundwater flow components provided in Tables 1 through 3.

**Table 1: Summarized information for the Dockum Aquifer. 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	Dockum Aquifer	0
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	Dockum Aquifer	0
Estimated annual volume of flow into the district within each aquifer in the district	Dockum Aquifer	1
Estimated annual volume of flow out of the district within each aquifer in the district	Dockum Aquifer	66
Estimated net annual volume of flow between each aquifer in the district	To Dockum Aquifer from overlying units	1
	To Dockum Aquifer from Dockum equivalent units	44



**Figure 1: Area of the groundwater availability model for the High Plains Aquifer System from which the information in Table 1 was extracted (the Dockum Aquifer extent within the district boundary).**



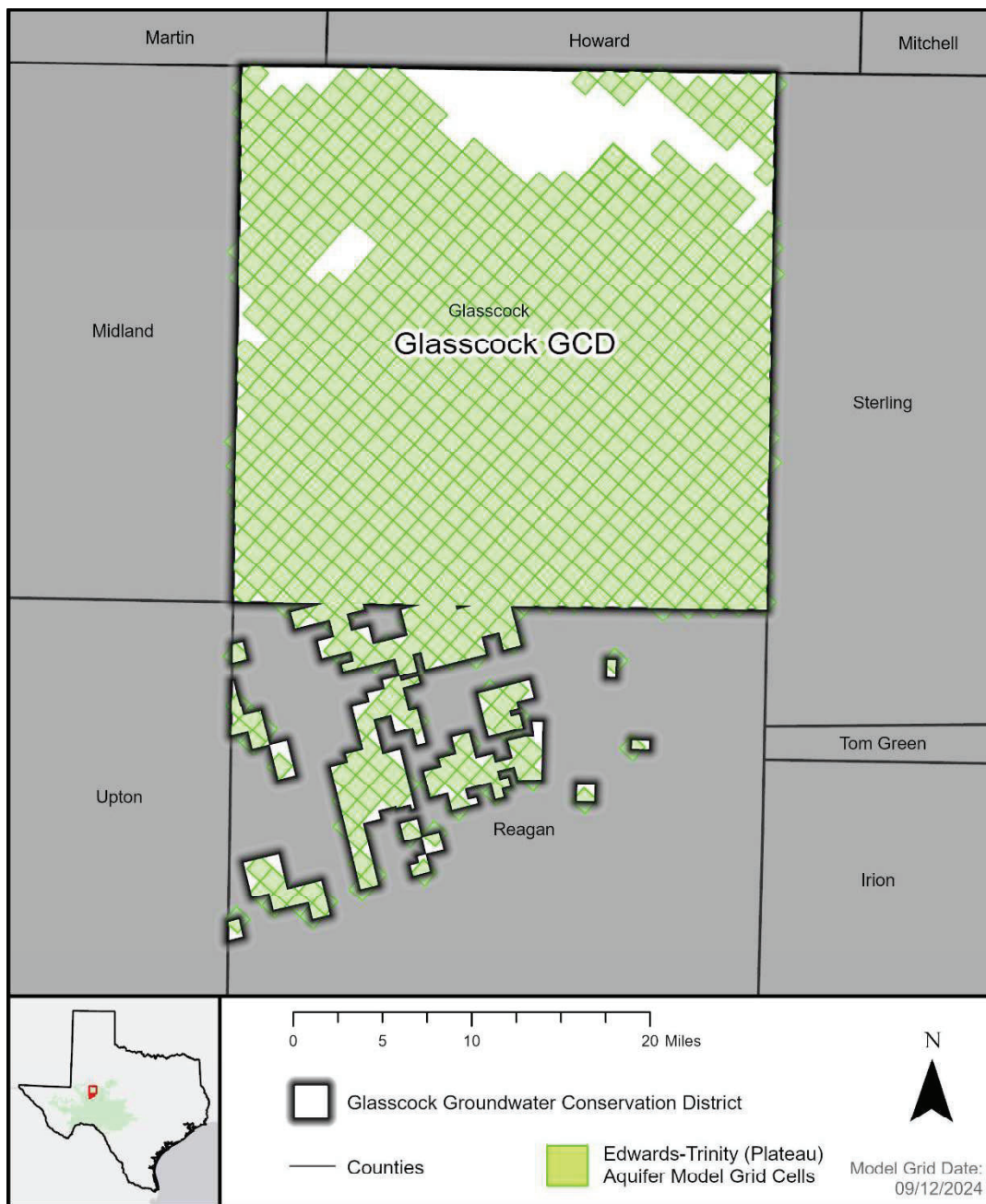
*Caveat: This diagram only includes the water budget items provided in Table 1. A complete water budget would include additional inflows and outflows. For a full groundwater budget, please submit a request in writing to the Groundwater Modeling Department.*

**Figure 2: Generalized diagram of the summarized budget information from Table 1, representing directions of flow for the Dockum Aquifer within the Glasscock Groundwater Conservation District. Flow values are expressed in acre-feet per year.**

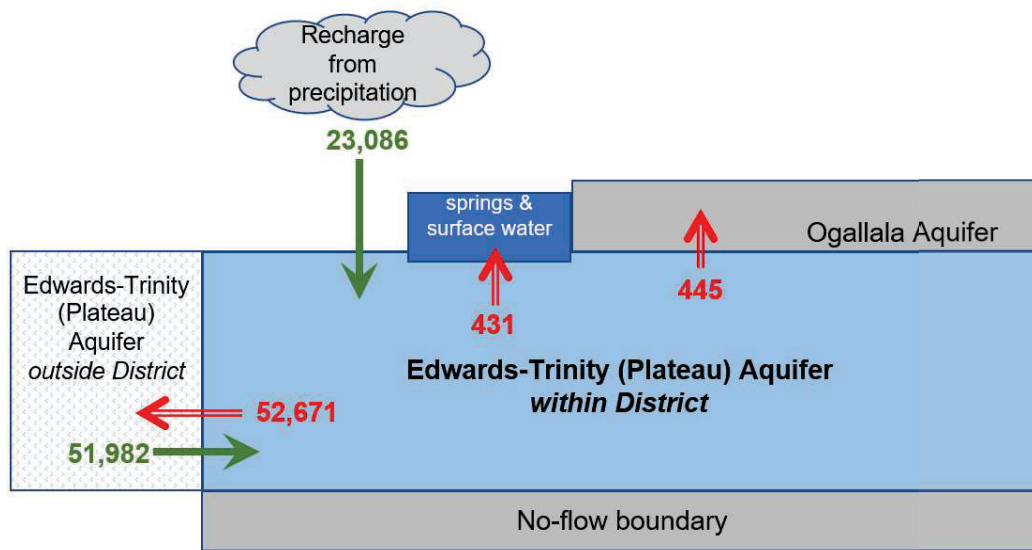
**Table 2: Summarized information for the Edwards-Trinity (Plateau) Aquifer. All values are reported in acre-feet per year and rounded to the nearest 1 acre-foot.**

Management plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Edwards-Trinity (Plateau) Aquifer	23,086
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	Edwards-Trinity (Plateau) Aquifer	431
Estimated annual volume of flow into the district within each aquifer in the district	Edwards-Trinity (Plateau) Aquifer	51,982
Estimated annual volume of flow out of the district within each aquifer in the district	Edwards-Trinity (Plateau) Aquifer	52,671
Estimated net annual volume of flow between each aquifer in the district	From Edwards-Trinity (Plateau) Aquifer to Ogallala Aquifer	445*

\*This value was extracted from the groundwater availability model for the High Plains Aquifer System.



**Figure 3: Area of the alternative one-layer groundwater model for the Edwards-Trinity (Plateau) and Pecos Valley aquifers from which the information in Table 2 was extracted (the Edwards-Trinity [Plateau] Aquifer extent within the district boundary).**

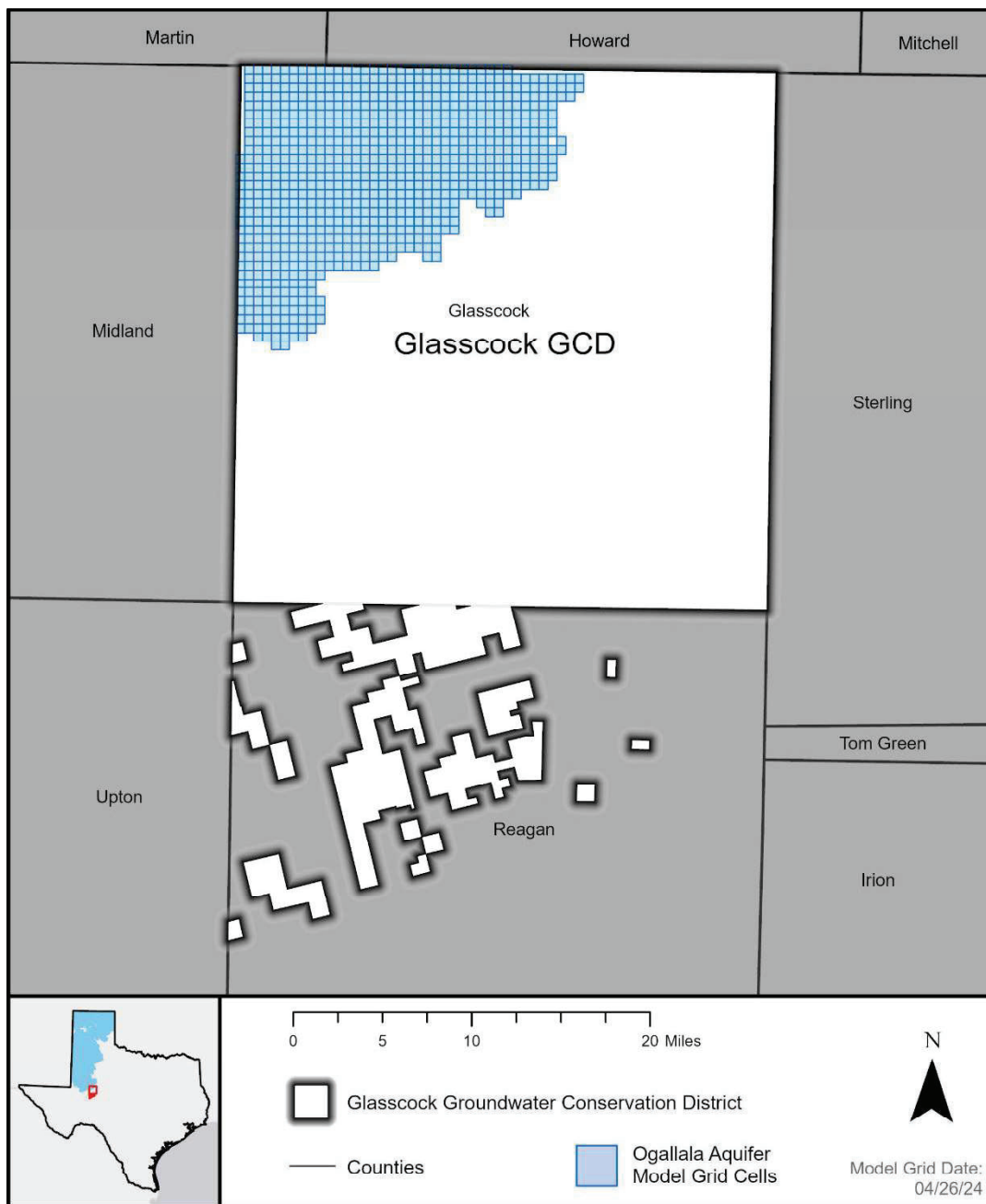


*Caveat: This diagram only includes the water budget items provided in Table 2. A complete water budget would include additional inflows and outflows. If the District requires values for additional water budget items, please contact TWDB.*

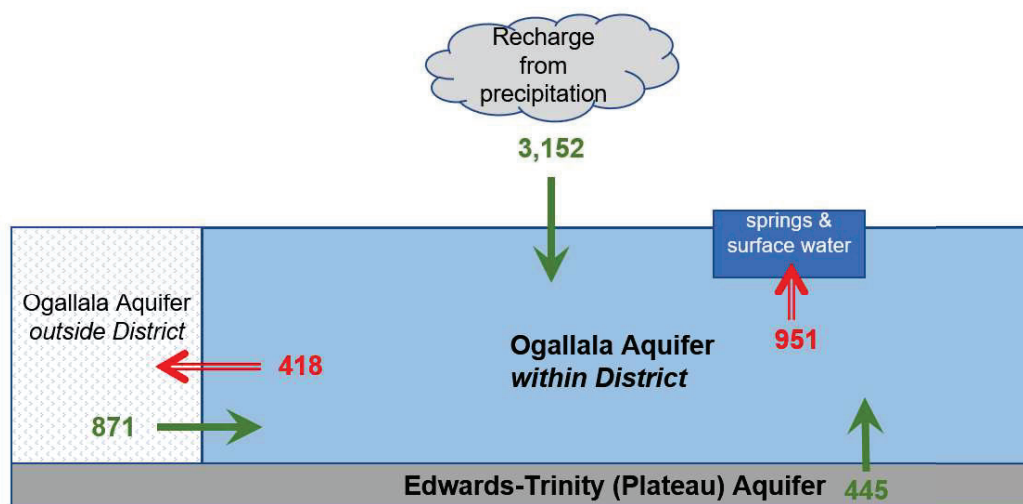
**Figure 4: Generalized diagram of the summarized budget information from Table 2, representing directions of flow for the Edwards-Trinity (Plateau) Aquifer within the Glasscock Groundwater Conservation District Flow values are expressed in acre-feet per year.**

**Table 3: Summarized information for the Ogallala Aquifer. 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	Ogallala Aquifer	3,152
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	Ogallala Aquifer	951
Estimated annual volume of flow into the district within each aquifer in the district	Ogallala Aquifer	871
Estimated annual volume of flow out of the district within each aquifer in the district	Ogallala Aquifer	418
Estimated net annual volume of flow between each aquifer in the district	To Ogallala Aquifer from Edwards-Trinity (Plateau) Aquifer	445



**Figure 5: Area of the groundwater availability model for the High Plains Aquifer System from which the information in Table 3 was extracted (the Ogallala Aquifer extent within the district boundary).**



*Caveat: This diagram only includes the water budget items provided in Table 3. A complete water budget would include additional inflows and outflows. If the District requires values for additional water budget items, please contact TWDB.*

**Figure 6: Generalized diagram of the summarized budget information from Table 3, representing directions of flow for the Ogallala Aquifer within the Glasscock Groundwater Conservation District. Flow values are expressed in acre-feet per year.**

## 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 historical pumping is as important as evaluating the volume of groundwater flow into and out of the district, between aquifers within the district (as applicable), interactions with surface water (as applicable), recharge to the aquifer system (as applicable), and other metrics that describe the impacts of that pumping. In addition, assumptions regarding precipitation, recharge, and interaction with streams are specific to particular 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.

## REFERENCES

- Deeds, N.E., and Jigmond, M., 2015, Numerical model report for the High Plains Aquifer System groundwater availability model, 640 p., [http://www.twdb.texas.gov/groundwater/models/gam/hpas/HPAS\\_GAM\\_Numerical\\_Report.pdf](http://www.twdb.texas.gov/groundwater/models/gam/hpas/HPAS_GAM_Numerical_Report.pdf).
- Harbaugh, A. W., 2009, Zonebudget Version 3.01, A computer program for computing subregional water budgets for MODFLOW ground-water flow models, U.S. Geological Survey Groundwater Software., [water.usgs.gov/nrp/gwsoftware/zonebud3/zonebudget3.html](http://water.usgs.gov/nrp/gwsoftware/zonebud3/zonebudget3.html).
- Harbaugh, A. W., Banta, E. R., Hill, M. C., and McDonald, M. G., 2000, MODFLOW-2000, the U.S. Geological Survey modular ground-water model -- User guide to modularization concepts and the Ground-Water Flow Process: U.S. Geological Survey Open-File Report 00-92, 121 p.
- Hutchison, W., Jones, I. C., and Anaya, R., 2011. Update of the Groundwater Availability Model for the Edwards-Trinity (Plateau) and Pecos Valley Aquifers of Texas. Texas Water Development Board Unpublished Report. [https://www.twdb.texas.gov/groundwater/models/alt/eddt\\_p\\_2011/ETP\\_PV\\_One\\_Layer\\_Model.pdf](https://www.twdb.texas.gov/groundwater/models/alt/eddt_p_2011/ETP_PV_One_Layer_Model.pdf).
- National Research Council, 2007, Models in Environmental Regulatory Decision Making Committee on Models in the Regulatory Decision Process, National Academies Press, Washington D.C., 287 p., [www.nap.edu/catalog/11972/models-in-environmental-regulatory-decision-making](http://www.nap.edu/catalog/11972/models-in-environmental-regulatory-decision-making).
- Niswonger, R.G., Panday, S., and Ibaraki, M., 2011, MODFLOW-NWT, a Newton formulation for MODFLOW-2005: USGS, Techniques and Methods 6-A37, 44 p.
- Texas Water Code § 36.1071
- Wade, S., 2018, GAM Run 18-022: Glasscock Groundwater Conservation, Management Plan 14 p., [www.twdb.texas.gov/groundwater/docs/GAMruns/GR18-022.pdf](http://www.twdb.texas.gov/groundwater/docs/GAMruns/GR18-022.pdf).