2022 Annual Report

2022 Board of Directors

Holly Fults – President

Linda Kaye Rogers – Vice President

John Worrall – Secretary/Treasurer

Doc Jones

Toby Shelton

2022 Staff Members

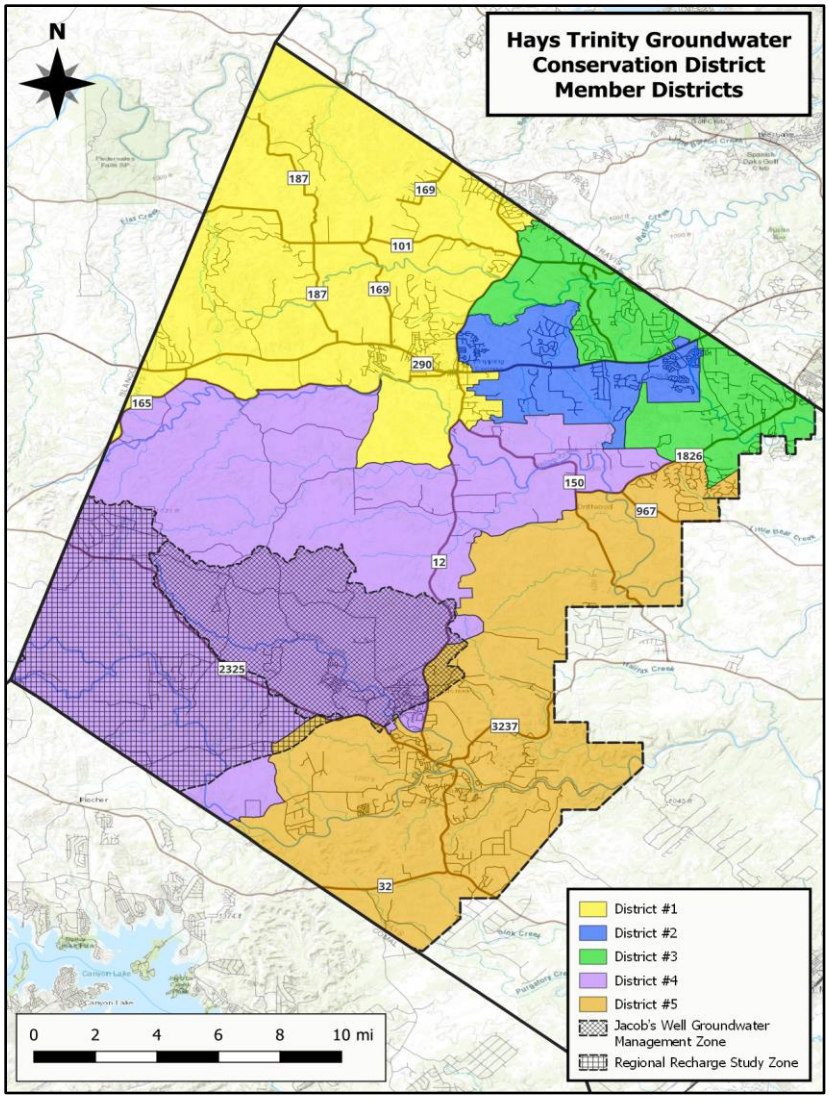
Charlie Flatten – General Manager

Philip Webster – Hydrogeologist

Radu Boghici PG -- Hydrogeologist

Keaton Hoelscher – Geo-Technician

Laura Thomas – Assistant General Manager



Researched and compiled in 2023 by:

Charlie Flatten, General Manager
Laura Thomas, Assistant General Manager
Radu Boghici, P.G., Hydrogeologist
Keaton Hoelscher, Geoscience Technician

2022 Board of Directors (January – November):

Holly Fults, President; Linda Kaye Rogers, Vice President; John Worrall, Secretary/Treasurer; Doc Jones; Toby Shelton.

2022 Board of Directors (December):

Linda Kaye Rogers, President; Bruce Moulton, Vice President; David Smith, Secretary/Treasurer; Doc Jones; Carlos Torres-Verdin.

2022 ANNUAL REPORT

HAYS TRINITY GROUNDWATER CONSERVATION DISTRICT
MANAGEMENT GOALS, OBJECTIVES, & PERFORMANCE STANDARDS

Executive Summary

The 2022 Annual Report is an account of the Hays Trinity Groundwater Conservation District's (District or HTGCD) management and protection of the Trinity Aquifer through the development of science, data gathering, regional groundwater planning, permitting, education, and outreach.

In 2022, the District initiated and participated in numerous activities including the development and refinement of local hydrogeologic science, education & outreach, policy directives, capital projects, and drought management in order to fulfill its objectives.

The financial health of the District in the short term is secure. However, due to revenue structures, a reduction in economic growth would negatively impact the District's revenues and its ability to effectively protect the groundwater resource. A move away from growth-based revenue is recommended. The District passed its mandated annual audit (2021) with a single recommendation. (See Financial Appendix)

A stubborn and severe drought dominated the District's management in 2022. The District declared Alarm Drought Stage in February of 2022. By September conditions had deteriorated such that western Hays County was in the highest stages of drought in the District's history. The Board amended rules 11, 13, and 15 in order to deliver a more rapid response to conservation and management of the aquifer during drought.

The HTGCD Board of Directors held 14 Board meetings and 4 Public Hearings in 2022 (Appendix, Section 1).

2022 Numbers At A Glance:

- 149 new wells in 2022
    - 145 exempt (domestic and agriculture)
    - 4 non-exempt
- 99 total active permits
    - 4 new permits issued
    - 3 permits retired
- 14.29 acre-feet/year increase in permitted volume in 2022
- 3,474 total permitted acre-feet/year
- 396 new public water supply connections

The District registered 149 new wells in 2022; 145 are exempt from regulation and 4 are non-exempt. The District added one observation/monitor wells to its network. The District issued 4 new permits for non-exempt withdrawals and retired 3 permits bringing the total to 99 active permits. The net change in permitted production is 14.29 acre-feet/year for a total of 3,474 acre-feet/year. There were 396 new public water supply connections reported to the District (Appendix, Section 2). Permitted plus estimated Exempt volumes committed totaled ~7,433 acre-feet/year leaving 1,665 acre-feet/year available from the Texas Water Development Board's (TWDB) Modeled Available Groundwater (MAG) allotment[1] of 9,098 acre-feet/year for the District. It should be noted that the 1,665 acre-feet volume remainder must be shared by future exempt (domestic and agriculture[2]) and non-exempt (commercial and other) users.

Decennial redistricting and the November election brought three new Directors to the Board. Linda Kaye Rogers was elected President at the December 2022 meeting.

Rules, Bylaws, Enabling Legislation, and other regulatory structures of the District can be found on the District website's Regulatory page.

In addition to the following prescribed Objectives and Performance Standards, the District maintains a robust Education and Outreach Program. 2022 highlights include the continuation of the Water Wise Speaker Series, creation of a new website, a Drought Town Hall Meeting, two stakeholder meetings to inform the Board of public input on potential drought rules changes, and various public facing education and outreach opportunities. See Appendix Section 5 for details.

Introduction

The Hays Trinity Groundwater Conservation District was created by the 77th Texas State Legislature (S.B. 2, 2001) in order to compile and develop sound hydrologic data and to manage and protect the aquifers that supply safe water in western Hays County as illustrated by the Map on page 2. The District is governed by a locally elected Board of Directors and s managed by District Staff as listed on the title page.

As required by District Bylaws (4.2, a) an annual report shall be prepared for and provided to the Board of Directors by District Staff on the status of the District and its programs. The *2021 Groundwater Management Plan* serves as a guide for the District's annual reports. The *2022 Annual Report* describes a methodology for tracking progress in achieving management goals. The headings in the report are prescribed by the Texas Water Development Board TWDB: TAC 356.52 (a)(2), (a)(3), TAC 356.52(a)(1), and in TWC 36.071. The District shall use this Report to document other business, such as Financial Reports.

[1] TWDB MAG model run GR21-014 stipulates a decreasing MAG over time.
[2] By Enabling Legislation design (and unlike most GCDs in the State), Agriculture is exempt from permitting in the HTGCD.

Management Objectives and Performance Standards

1. Goal: Providing the Most Efficient Use of Groundwater

1.1. *Management Objectives*

Each year, the District will hold at least one educational event.

Performance Standard

Each year, a summary of the District educational events schedule will be included in the Annual Report

HTGCD attended, participated, hosted, or presented in the following educational, outreach, and planning events:

January 2022

- Hosted: Meet w/Shield Ranch @ wells
- Hosted: HTGCD Board Meeting
- Participated: Romano Ranch site inspection re. Aqua spill
- Hosted: Fee committee mtg
- Attended: Southwest Travis County GCD Board Mtg.
- Hosted: Rep. Zwiener @ DS TLAP
- Participated: Region K
- Hosted: Interview new hydrogeologist
- Participated: THCCN Water Team
- Participated: RWQPP

February 2022

- Hosted: Lloyd-Gosslink Attys at Law
- Hosted: Radu B. Interview
- Participated: THCCN
- Hosted: HTGCD Board Meeting
- Participated: TAG-D Bootcamp
- Participated: TAG-D Business Mtg.
- Participated: DSUC
- Attended: DS Appeals Court argument
- Hosted: Allison Bass & Magee
- Attended: CTWC
- Hosted: Marcos Pacheco Hays County Development Services
- Participated: Fitzhugh Creek spill site visit
- Hosted: Philip Exit Interview
- Participated: Region L
- Hosted: Redistricting Committee
- Attended: Joe Day RIP
- Hosted: HTGCD/BSEACD Mgrs. Mtg.

- Hosted: Marcos Pacheco / Holly Fults

March 2022

- Participated: HCMN Hydro-Geo 101 Lecture/Presentation
- Hosted: HTGCD Board Meeting
- Participated: Coleman Canyon well visit
- Hosted: Hill Country GCD GM Mtg.
- Participated: RWQPP
- Participated: HCA – GMA/DFC Planning
- Hosted: Wierman
- Hosted: Aqua Texas
- Participated: Radiance well site visit
- Hosted: Bass Allison Magee Redistricting Committee mtg.
- Participated: Commissioners meeting
- Hosted: DS Mayor mtg. w/JW
- Participated: TCEQ/DS-TLAP Public Meeting.
- Hosted: Mirasol Mtg. w/Tarver/McCarthy/Truitt/etc.

April 2022

- Hosted: Permitting Workshop
- Hosted: William Little III – DS
- Participated: GMA/DFC Panel Huddle
- Hosted: HTGCD Board Meeting – Wimberley
- Hosted: GMA/DFC Workshop – Wimberley
- Hosted: JWGMZ monitor well coring Site Visit
- Participated: DSUC meeting -- DS
- Participated: Roy Creek well visit
- Hosted: Joel Pigg – Texas A&M Agrilife
- Participated: DS Founders Fest
- Participated: DS Founders Fest
- Participated: GCD Bootcamp (Laura)
- Participated: Little Blanco Well Measurement – Meadows
- Participated: Region K
- Hosted: JWGMZ Video Shoot for E&O purposes

May 2022

- Attended: DSWSC Future Water Workshop
- Hosted: HTGCD Board Meeting – DS
- Participated: GMA-9 – Boerne
- Attended: SwTCGCD Board Meeting
- Hosted: Aaron Reed
- Participated: DS Utility Commission
- Hosted: GCD Mgr's meeting
- Participated: Barnabas Connection Well Site Visit
- Hosted: CTGCD Board Member meeting (Modeling)

- Attended: RWQPP
- Participated: Region K Demand Projection Committee mtg.
- Participated: GMA-10 San Antonio
- Participated: UT Geoscience Field Methods Talk

June 2022

- Participated: UT Geoscience Field Methods Camp
- Hosted: HTGCD Board Meeting – DS
- Hosted: Aqua Sewage Spill mtg w/Mayor Rasco
- Participated: TAGD Legislative Committee meeting
- Participated: DS Utility Commission
- Attended: Region 10 RFPG
- Attended: BSEACD Bd Meeting
- Attended: SWTCPUA
- Participated: GMA-9 – Boerne
- Hosted: Tri-County GM Meeting
- Participated: La Ventana HOA Presentation
- Participated: RWQPP
- Participated: TAGD Legislative Committee meeting
- Participated: Little Blanco Measurement

July 2022

- Hosted: HTGCD Board Meeting – DS
- Hosted: Horseshoe Ridge RV
- Hosted: DSWSC Committee Meeting w/Ellis
- Hosted: Rusty Tarver/ H&H
- Hosted: Henry Brooks Ranch
- ~~DSUC~~ cancelled
- ~~DSWSC / GCD NOAV mtg~~. postponed -- again
- Participated: Buttercup Ranch
- Hosted: Vista Brewing outreach
- Participated: THCCN

August 2022

- Participated: Region L RWPG
- Hosted: HTGCD Board Meeting – Wimberley
- Participated: THCCN
- Hosted: DSWSC NOAV mtg.
- Hosted: Silver Creek Presentation
- Participated: DSUC
- Participated: TAGD Lege Committee
- Hosted: Budget
- Hosted: GMA-9 Committee
- Participated: GMA-9
- Hosted: GMA Workgroup

- Hosted: Wimberley Hill RV
- Hosted: Hays Co Environmental Office
- Participated: BRAAT
- Participated: Robert Adam site visit
- Attended: House Natural Resource Committee
- Hosted: Silver Creek meeting
- Hosted: Wet Rock/Aqua meeting
- Hosted: Drought Stakeholder (South)
- Attended: TAGD Summit

September 2022

- Attended: TAGD Summit
- Hosted: HTGCD Board Meeting – DSWSC
- Hosted: TWDB News Video
- Attended: TCEQ HQ for DSWSC TLAP
- Hosted: Town Hall
- Participated: Ceran Jaquiot
- Attended: Andy Weinberg TWDB Monitor Well services
- Attended: Billy Rhyne MT Monitor well
- Attended: DSUC
- Hosted: Mirasol
- Hosted: Onera
- Attended: HCNIPA Team
- Participated: Westcave Roundtable
- Participated: RWQPP
- Hosted: Northern Stakeholder meeting for proposed Trigger/Indices
- Attended: HCA Leadership Summit

October 2022

- Hosted: Prospective Acct. Interview
- Hosted: Onera Workshop
- Participated: Woodcreek Water Days
- Hosted: Trinity Aquifer Model
- Hosted: Intera/Mirasol
- Hosted: HTGCD Board Meeting
- Participated: Shield Ranch tour for proposed amphitheater
- Participated: Jacobs Well Gauge operations
- DSUC – Postponed
- Participated: GMA-9
- Hosted: Stonehouse Inn Meeting
- Hosted: Brian Zavala: website
- Participated: THCCN water
- Attended: Texas Invertebrate Forum
- Participated: Site visits

- Participated: GCD GM Meeting
- Hosted: New Board Orientation
- Participated: THCCN Natural Infrastructure Plan
- Participated: Region K
- Participated: DFC EDF/etc
- Participated: RWQPP

November 2022

- Participated: Region L
- Hosted: HTGCD Board Meeting
- Hosted: Don Rauschuber/Larry Hutts – Silver Creek
- Hosted: Don Rauschuber -- Driftwood Recovery
- Participated: DSUC
- Attended: BSEACD Board Meeting
- Hosted: Intera/Mirasol
- Participated: Intera/SWTCGCD
- Hosted: GE/WSP
- Participated: SWARA (Laura)
- Participated: GMA-9 DFC Working group
- Participated: Aqua/WVWA
- Participated: BRAAT
- Participated: Shield Ranch/Beerburg speaking event
- Hosted: Summer Moon Architects
- Participated: RWQPP

December 2022

- Hosted: HTGCD Board Meeting
- Participated: GMA-9
- Participated: Cypress Creek WPP
- Participated: Aqua/WVWA

2. Goal: Controlling and Preventing Waste of Groundwater

2.1. *Management Objectives*

Each year, the District will take complaints from any concerned citizen or entity in the District on cases of waste or possible waste.

Performance Standard

In each Annual Report, the District will include a discussion of the recent issues with waste and recommend any amendments to the rules to prevent the waste of groundwater.

District Staff reports to the Board of Directors during public meetings on the topic of waste. No official public complaints were submitted to the District office concerning waste or possible waste during 2022. However, the District offices did field complaints about excessive irrigation and vanity ponds.

The District relies on the online Quarterly Reporting process that allows all District operating permit holders instant access to enter and review their own production, sales, connections, and percent losses. Communication concerning loss is tied directly to each quarterly report. This gives the permit holder and the District an electronic record of reasons for loss including circumstances such as line-breaks, meter replacement, fires, or flushing. It also gives an indication of historic line loss and information on permittees who have habitually high line loss due to inadequate maintenance[3]. An example of a Quarterly Report can be found in **Figure 1,** below.

Quarterly Pumpage Report

Forms | My Profile | Log off

Non-Exempt Well - Quarterly Reporting - FORM #: 2009-1A

Permit Holder [redacted] Year 2019 Quarter [redacted] Go

Water Level Information	April		May		June	
Well Id / Name	Water Level	Water Level Date	Water Level	Water Level Date	Water Level	Water Level Date
1050111	0.0		0.0		0.0	

Add Another Well | Remove Well

	YTD Totals	Qtr Totals	April	May	June
Groundwater Pumped Total	3,741,800	1,992,000	567,800	680,900	743,300
Other Water Sources	0	0	0	0	0
Sold / Used	3,435,900	1,854,200	530,300	638,800	685,100
Total # Service Connections			102	102	102
New Service Connections			0	0	0
Notes / Comments, New Connection Addresses			Leaks, broken lines.	Leaks, broken lines.	Leaks, broken lines.
Loss	305,900	137,800	37,500	42,100	58,200
Loss Percent	8.18 %	6.92 %	6.6 %	6.18 %	7.83 %

SAMPLE

Figure 1: Quarterly Report showing an example of how line loss is calculated.

[3] Rule 2.1 Waste B, E.

3. Goal: Controlling and Preventing Subsidence

The rigid geologic framework of the region precludes significant subsidence from occurring. Therefore, this goal is not applicable to the operations of Hays Trinity Groundwater Conservation District.

4. Goal: Addressing Conjunctive Surface Water Management Issues

4.1. *Management Objective*

Each year, the District will promote the use of surface water or other alternatives to groundwater in growing areas where groundwater demand is projected to lower the water tables and to reduce stream and spring flow to unacceptable levels.

Performance Standard

The District will strive to meet with the planning departments of major surface water providers within the District at least once per year. The District will summarize these meetings and their outcomes in the Annual Report.

Dripping Springs Water Supply Corporation (DSWSC) and the West Travis County Public Utility Authority (WTCPUA) are the two major surface water providers in the northern portion of the District. They supply wholesale and retail water sourced from the Lower Colorado River Authority (LCRA) Highland Lakes resource. Below is a list of meetings held with DSWSC or WTCPUA.

Meetings*:*

- Charlie Flatten and select Board members communicated or met on a more than monthly basis with DSWSC Staff and select Board members on conservation, legislation, permitting, and fee definitions.
- Charlie Flatten and WTCPUA Director met to discuss the PUA's potential expansion of services and/or expansion of supplies to the DSWSC.
- Charlie Flatten serves on both of the District's Regional Water Planning Groups (Blanco/Guadalupe and Colorado River basins) where he monitors future plans to move surface water up into the HTGCD.
- District Staff promotes the use of rainwater at every available interaction with the public in order to reduce the use of groundwater.

5. Goal: Addressing Natural Resource Issues Which Impact the Use and Availability of Groundwater and Which are Impacted by the Use of Groundwater

5.1. *Management Objective*

Each year, the District will make at least one endorsement or contribution to ongoing studies of geologic, environmental, or hydrogeologic studies being performed in the district area.

Performance Standard

Each year, a summary of the District's contributions or endorsements of ongoing studies will be included in the Annual Report.

COMPLETED STUDIES

Science Reports

- *Evaluating Compliance With the Desired Future Conditions Within Hays Trinity Groundwater Conservation District* (Boghici)
- *Strontium in Groundwater Within Hays Trinity GCD Report and Map* (Boghici)
- *Evaluating Aquifer Saturated Thickness as a Replacement for the Percentile Water Level Map* (Boghici)
- *Potential MAG/DFC Achievement Projection Through Various Population & Policy Scenarios* (Webster, Boghici)
- *HTGCD Drought Trigger Methodology* (Boghici)
- *Barton & Fitzhugh Creek Blue Dye Spill Report* (Boghici, Flatten)
- *Aqua Texas Sewage Spill onto the Romano Property* (Flatten, Webster)
- *Special Study Zone (Rule 16): Aquifer Level Analysis* – ongoing (Webster, Boghici, Flatten)
- *Mirasol Water Availability Study* -- ongoing (Webster, Boghici, Flatten)
- *Mirasol Water Availability Study* -- ongoing (Oliver, et. al.)
- *Surface Water/Groundwater Interactions Along Barton Creek* – ongoing (Webster, Boghici, Flatten)
- *Little Blanco River Gain-Loss Study* -- ongoing (Wierman, Walker, Webster, Boghici)
- *Potentiometric Surfaces of the Lower and Middle Trinity Aquifer in Southwestern Hays County, Texas* (Webster, Boghici)
- *District Drought Trigger Methodology: Technical Evaluation; Plus 4-5 PowerPoint DTM Presentations For Stakeholders And Board* (Boghici)
- *Identifying The Source Of Young Groundwater Fraction In Lower Trinity Samples* (Boghici)

Science Reports by others using HTGCD data and resources

- *Preliminary Report on the Installation of Two Multilevel Monitor Wells Near Jacob's Well:* BSEA/CD (Smith, Watson, Camp)
- *Hydrogeologic Investigations of the Trinity Aquifers in Western Travis County along a Portion of Lake Travis and a Transect from Northern Hays County to Bell County, Central Texas:* BEG (Hunt, Cockrell, Smith)

Policy Reports

- *Desired Future Condition (DFC) Computation Methodologies Utilized by Texas Hill Country Groundwater Conservation Districts* (Flatten)
- *Hill Country GCD Survey on Well Spacing Rules* (Flatten, Boghici)
- *Water Quality Protection: Groundwater Conservation District Responsibilities and Obligations in Texas* (Fults)
- *HTGCD Drought Management Policy Review* (Flatten)
- *HTGCD Drought History Report* (Flatten)
- *HTGCD Fee & Penalty Audit* (Flatten)
- *HTGCD Statement of Purpose* (Flatten)
- *JWGMZ Development Guide* (Flatten)
- *HTGCD Fee & Penalty Schedule: 2022 Audit* (Flatten)
- *Hill Country GCD Fee & Penalty Report* (Flatten)
- *2022 Well Registration and New Permit Pilot Program* (Flatten)
- *2021 Annual Report*
- *TWDB Management Plan*

ONGOING STUDIES

Dedicated Monitor Well Project: The HTGCD Dedicated Monitor Well Project continued in 2022. The Dedicated Monitor Well Project is designed to provide long-term water-level monitoring and ongoing groundwater quality data from carefully selected well sites in western Hays County. A complete aquifer formation evaluation program was carried out at each borehole, including core and cutting samples analyses, geophysical logging, down-hole video, aquifer testing, and water sample recovery. An extensive technical report was completed for each location and posted to the District website. Funding for the project came from HTGCD, Hays County, Dripping Springs Water Supply Corporation, and Barton Springs Edwards Aquifer Conservation District (BSEACD). Technical support and assistance were provided by District Staff, the Blanco Pedernales Groundwater Conservation District, BSEACD, Edwards Aquifer Authority, Texas Water Development Board, the University of Texas Bureau of Economic Geology, and the Texas State University Meadows Center for Water & the Environment. There is also outstanding cooperation and assistance from local landowners who allow District access to their properties.

As a result, continuous water level data and periodic water quality samples are collected from the dedicated monitor wells and made available to the public. Through ongoing monitoring of the dedicated wells, the District continues to expand the reliable long-term record of water levels and groundwater quality, a critical dataset for informing groundwater management decisions.

Blanco River Aquifer Tool for Water and Understanding Resiliency and Sustainability Trends (BRAAT): HTGCD technical staff worked with a group of geoscientists led by the Meadows Center to develop the second phase of this surface-groundwater interaction-based model. Phase 2 will include the development of a numerical model from the conceptual model, which will have the capabilities to simulate groundwater recharge, spring discharge, flow in the Trinity Aquifer, and surface water-groundwater interactions. The groundwater flow model will provide HTGCD, BSEACD, and Hays County with a valuable tool for evaluating groundwater availability in Hays County and pumping impacts to the Trinity Aquifer, springs, and surface water. See *Blanco River Aquifer Assessment Tool A Tool to Assess How the Blanco River interacts With Its Aquifers: Creating the Conceptual Model* (Martin et al., 2019).

District Hydrogeological Analyses of the Trinity Aquifer System: Hydrogeologic data from the Trinity Aquifer was collected and analyzed during 2022. This is an ongoing project designed to acquire and interpret pertinent technical data and to apply this information to District operational management. Data includes geophysical well logs, cuttings samples, groundwater levels, groundwater samples & chemical analyses, pumping test reports, surface geology, and groundwater use (pumpage). This information is maintained in the District's growing database and is used in conjunction with the TWDB groundwater database. Local and regional modeling projects such as the TWDB Conceptual Model of the Hill County Trinity Aquifer and more local modeling will incorporate this data into their analyses.

Jacob's Well Groundwater Management Zone: In March 2020, HTGCD Board of Directors approved the creation of the Jacobs Well Groundwater Management Zone (JWGMZ) via Rule 15. This project was the culmination of technical staff, an interagency group of groundwater scientists, and stakeholder collaboration. Staff began an implementation process to guide permittees in the regulatory process. The Board also began JWGMZ specific Drought Stage declarations based on triggers set by rule. Rule 15 expressly specifies that the Board will take no enforcement action until March 2021. Note: An April 2021 Public Hearing and Board action delayed enforcement until March 2022 due to Covid concerns. 2021 Board action made several changes to Rule 15's drought management and curtailment provisions to create a more predictable assessment of annual production during drought. Board action also recognized previous conservation achievements by permittees through the grant of conservation credits that are applied to curtailment baselines.

March of 2022 saw final implementation and full permitting of all non-exempt groundwater users in the Zone. All rules will be applied to permittees. The first round of overproduction NOAVs will be applied to qualified permittees in early 2023.

HTGCD Surface Water Monitoring Project: Groundwater-surface water interactions are a critical component of the story of recharge and discharge within the Trinity Aquifer in western Hays County. By periodically measuring surface water flows, hydrogeologists develop a greater understanding of how these interactions impact the aquifer and change over time. This ongoing project will rely on continued data gathering. Technical staff will continue to collect surface water flow data in the Blanco, Onion Creek, and Barton Creek basins to develop a greater understanding of groundwater-surface water interactions in the District.

Technical Staff will also continue to collaborate with Meadows Center for Water and the Environment scientists in the ongoing *Little Blanco Occurrence of Flowing Water* surface water – groundwater interaction study.

Lower Trinity Project: The Project was initiated in 2012 to evaluate the potential for an alternative groundwater source for western Hays County. Previous Lower Trinity studies have consisted of aquifer testing to define aquifer parameters and overall groundwater availability and adding Lower Trinity wells to the District's Monitoring network. The hydrogeological evaluation of the Lower Trinity Aquifer was given a higher priority in 2022 by new staff hydrogeologist Radu Boghici PG -- with the addition and analyses of geophysical logs and water samples. The northeastern part of the District is an area of ongoing study due to rapid development where the Middle Trinity Aquifer appears to be dewatered, and new wells are finding minimal production from the Lower Trinity Aquifer.

6. Goal: Addressing Drought Conditions

The continued health and potential sustainability of the Trinity Aquifer is the primary informer of the (**Figures 6, and 7)**. District's outlook and actions. Drought is the most difficult variable in the hydrologic equation to manage. In order to protect drinking water wells and thus property values, the District employs a variety of drought management tools ranging from education to prescribed curtailment.

The District declared drought in response to triggers defined in its Drought Management Plan. 2022 saw the District (minus the JWGMZ) in 0% Drought Stage from January through April, 20% Alarm Stage from May and June, 30% Critical Stage in July, and 40% Emergency Stage from August through the year's end. The Jacobs Well GMZ was in 0% Drought in January, 20% from February and March, and 30% Drought from April to year's end. It is important to note that 2022 saw the first District-Wide 40% Emergency Stage in the

history of the District. **Figure 2** shows how drought impacted Texas in 2022 (Source: U.S. Drought Monitor).

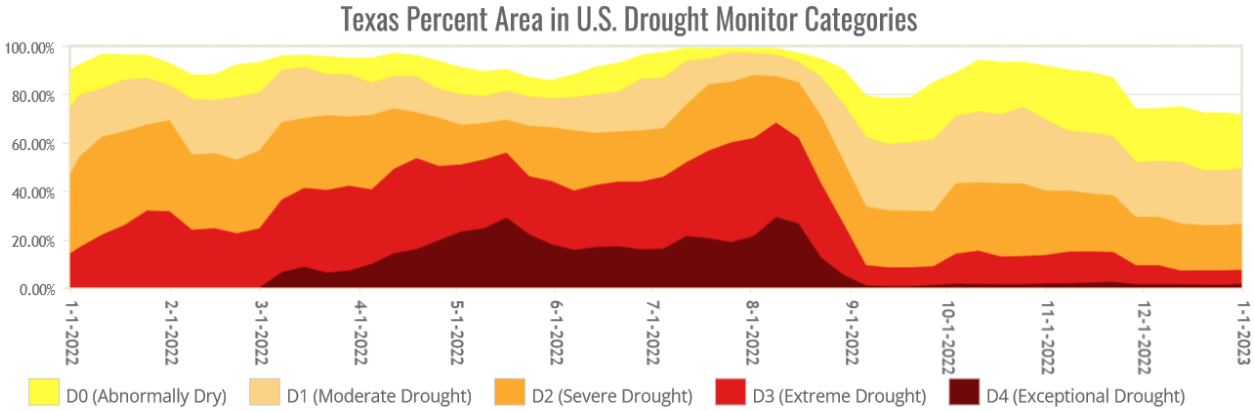


Figure 2: Percent of Texas in Drought Throughout 2022. D0 = No Drought, D4 = Max Drought

The District fulfilled its Annual Requirements described below and began enforcing the Rules associated with the Jacob's Well Groundwater Management Zone, which was created to protect Trinity Aquifer resources in the Jacob's Well Springshed. Those Rules provide for stronger drought restrictions in the Management Zone.

Additionally, the District conducted multiple scientific and policy reviews (See Section XX) in coordination with a stakeholder outreach process in order to enact several new drought rules (Chapters 11, 13, and 15) that created restrictions on new well construction notices and new permits or permit amendments during Critical or Emergency Drought Stages.

- Rule 11.1.4(B): Suggests all pump and aquifer test discharge have a beneficial use
- Rule 13.3.2: Defines Drought Stage names and curtailment rates
- Rule 13.3.3(A-C): Strengthens restrictions on pond-filling during drought, prohibits new permit applications & permit amendments for additional production, and prohibits new non-exempt well construction during the top 2 drought stages
- Rule 15.2.4 (B): Prohibits pond-filling from non-exempt wells during drought in the JWGMZ

The District is fulfilling its Rule 16 requirement to gather scientific data on the 56-square mile Regional Recharge Study Zone. See Appendix, Section 3:

7

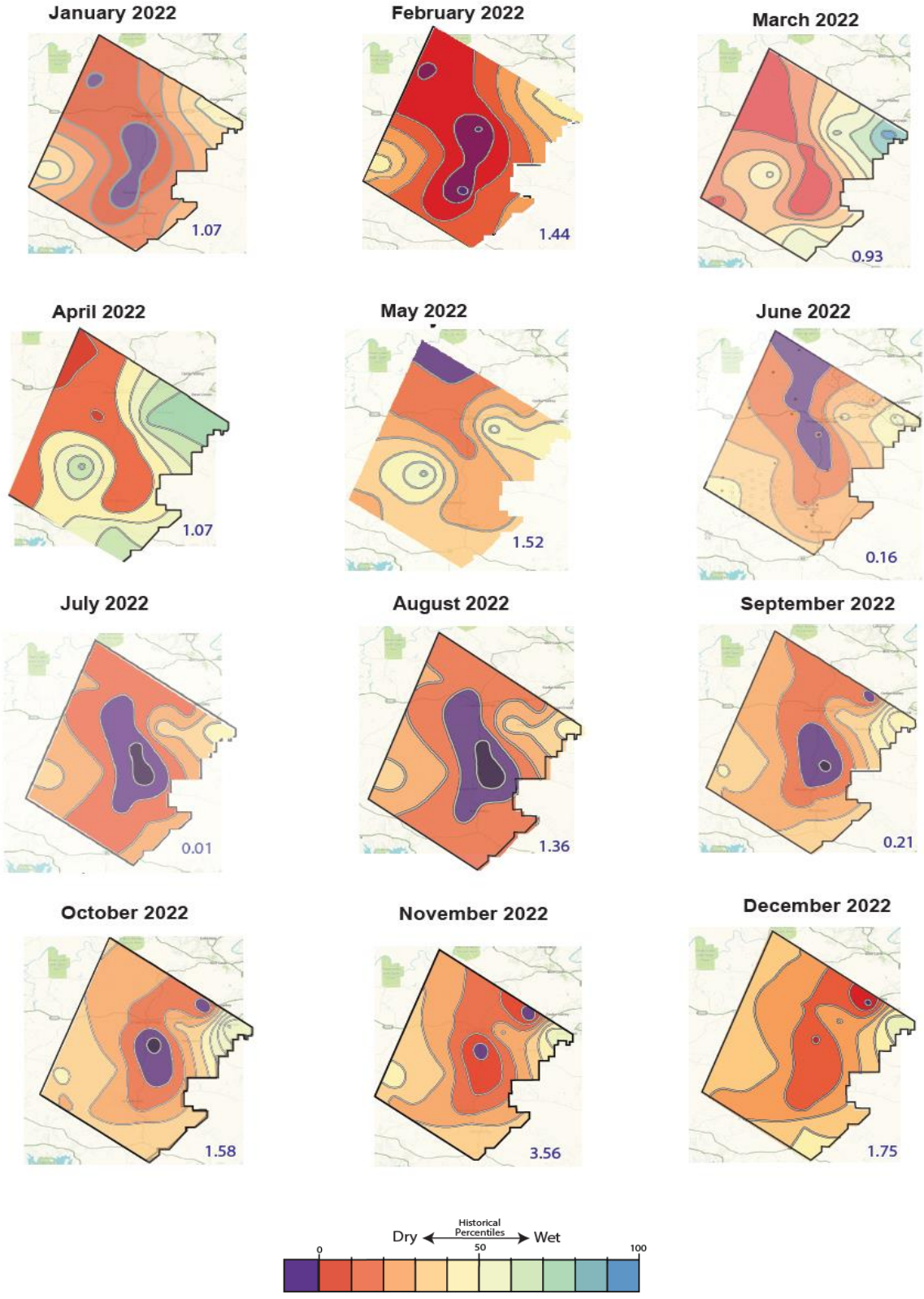


Figure 3: Timestep Water Level Percentiles for the Middle Trinity Aquifer

Water level percentiles in **Figure 3** represent the water level elevations in wells as a percentage relative to the maximum historical water levels. Historical values are from 2008 to 2019. A percent of zero would represent the lowest historical water level, while 100 percent represents the highest historical water level. Shades of purple represent negative values, signifying water levels below the 2008-2019 minimum.

6.1. *Management Objective*

The District has developed individual permit specific User Drought Contingency Plans to protect and conserve groundwater during critical drought conditions. The plan will be updated as additional data becomes available.

Performance Standard

The District will post a copy of the plan on the HTGCD website and will include an updated Drought Contingency Plan, available to end-users, in the Annual Report.

The District updated its Drought Contingency Plan in 2022 to reflect new drought requirements for the JWGMZ (see Appendix, Section 3). The District updated its User Drought Contingency Plan (UDCP) for all non-exempt operating permit holders (see Appendix, Section 3). The UDCP is available for review on the District's website under Forms. The District updated its Water Conservation Plan (see Appendix, Section 3) which is also part of the paperwork required by the District for all new and amendment operating permit applications to be administratively complete.

A Drought Production Cutback Chart is included with each new permit, amended permit, and permit renewal. An example of a Drought Production Cutback Chart can be seen in **Figure 4**, below. The cutback chart divides the permitted amount of each permit to show an exact monthly production, in gallons, for every possible drought stage so permit holders can prepare for Board-declared drought conditions.

6.2. *Management Objective*

Each quarter, the District will check the National Weather Service – Climate Prediction Center website (https://www.ncdc.noaa.gov/temp-and-precip/drought/weekly-palmers/) for updates of the Palmer Drought Index. The District will download the updated Palmer Drought Severity Index (PDSI) map and check for periodic updates on www.waterdatafortexas.org/drought.

Performance Standard

Quarterly, the District will assess the status of drought in the District and prepare a quarterly briefing to the Board of Directors. The downloaded PDSI maps will be included with copies of the quarterly briefing in the District Annual Report to the Board of Directors.

The General Manager's Monthly Report includes a briefing on the status of drought within the District and is given to the Board of Directors during Board Meetings. The briefing includes maps from the US Drought Monitor and the Palmer Drought Severity Index, monitor well level averages, and HTGCD drought trigger updates (see Appendix, Section 3). HTGCD Staff records and addresses all filed complaints of waste or possible waste during the drought briefing. HTGCD Staff provides a monthly review of the current drought status to the Board of Directors at regular open meetings.

6.3. *Management Objective*

Each year, the District will collect monthly water level data from a network of monitoring wells.

Performance Standard

Each year, a report of the District water level collection activities, including a table of the water levels measured in District monitoring wells, will be included in the annual report.

Monthly, District Staff collects water levels from dedicated District monitor wells (**Figure 5,** page 22). The information collected is entered into and displayed on the District's website as hydrographs transposed with rainfall data collected from NOAA The public can access the District's website for more specific data by scrolling over the hydrographs to see elevation above mean sea level and surface to top of water level measurements. Hydrographs for Mount Baldy and Henly Church wells (**Figures 6** and **7**, page 23), and the flow rates from the Blanco and Pedernales Rivers are used to measure the current health of the aquifer. One can find current flow rates of the Blanco and Pedernales Rivers on the District Drought Management webpage.

In addition, District staff downloads quarterly data from 18 transducer wells within western Hays County. This information is located on the District's website for public use.

See Appendix, Section 3 for the 2022 Monitor Well Levels chart describing monthly water level measurements.

Drought Production Cutback Chart

[Permittee]			5.12 Acre-ft.				Tier:	2
2021			1,668,357 Gallons					
Month	Gallons Produced	Monthly % of Annual Permit	Drought Stage	Suggested Allotment	Drought Stage 1 Voluntary 10%	Drought Stage 2 20%	Drought Stage 3 30%	Drought Stage 4 40%
January		6%		100,101	90,091	80,081	70,071	60,061
February		7%		116,785	105,106	93,428	81,749	70,071
March		7%		116,785	105,106	93,428	81,749	70,071
1st Quarter		*20%*						
April		7%		116,785	105,106	93,428	81,749	70,071
May		8%		133,469	120,122	106,775	93,428	80,081
June		10%		166,836	150,152	133,469	116,785	100,101
2nd Quarter		*25%*						
YTD		*45%*						
July		12%		200,203	180,183	160,162	140,142	120,122
August		12%		200,203	180,183	160,162	140,142	120,122
September		10%		166,836	150,152	133,469	116,785	100,101
3rd Quarter		*34%*						
YTD		*79%*						
October		8%		133,469	120,122	106,775	93,428	80,081
November		7%		116,785	105,106	93,428	81,749	70,071
December		6%		100,101	90,091	80,081	70,071	60,061
4th Quarter		*21%*						
TOTALS		*100%*						

SAMPLE

Figure 4: Example of a Drought Production Cutback Chart

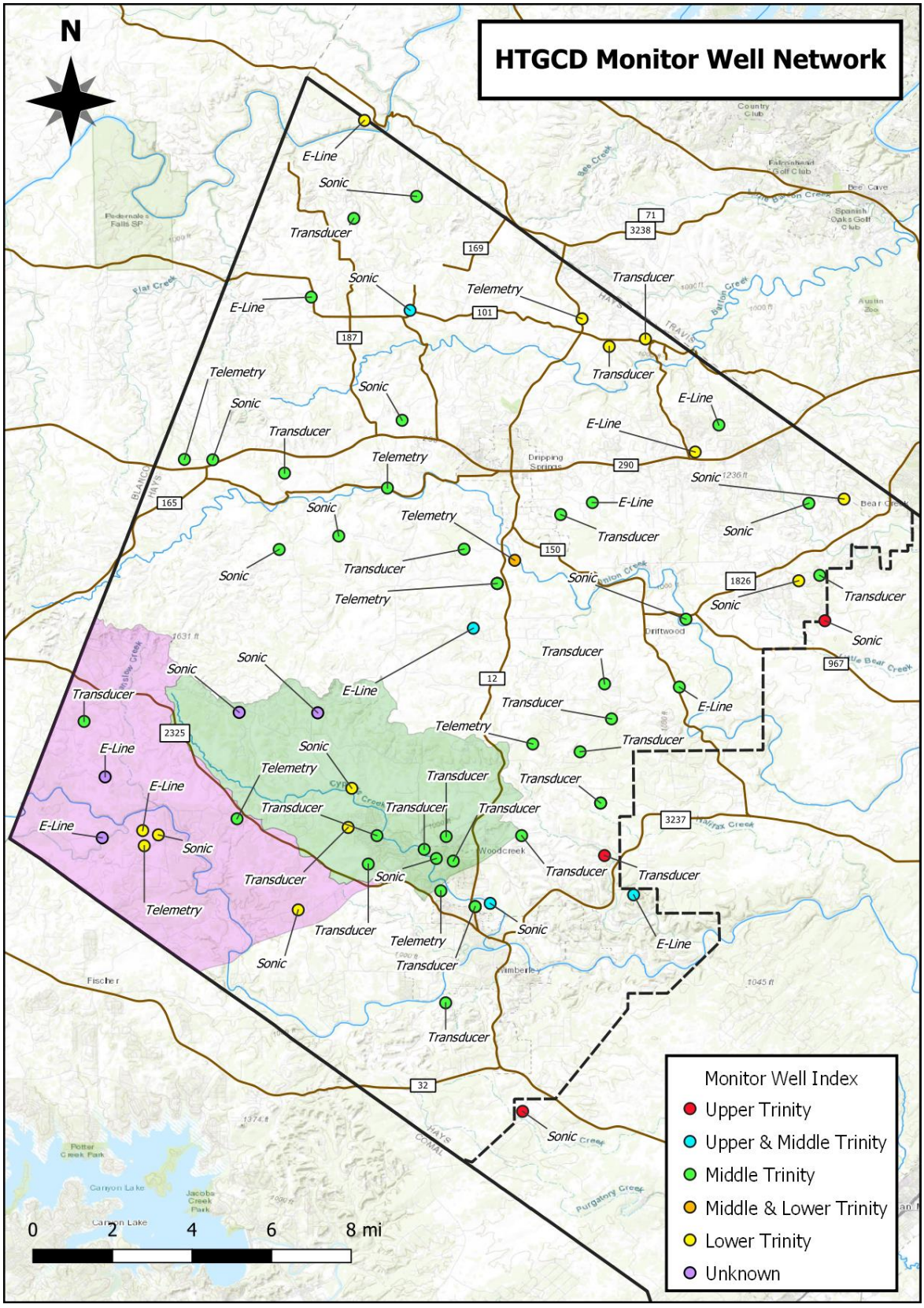


Figure 5: District Well Water Level Monitoring Network

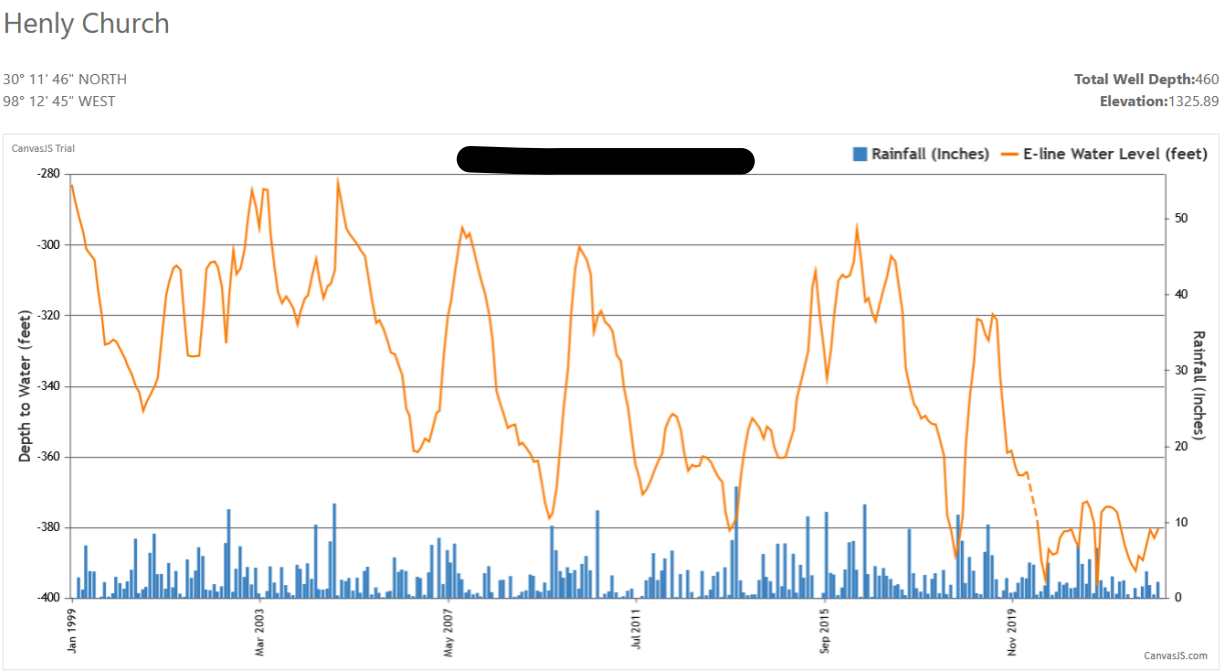


Figure 6: Henly Church Well Hydrograph Showing Water Level Elevation (ft. above sea level) and Monthly Rainfall (inches).

Mt. Baldy

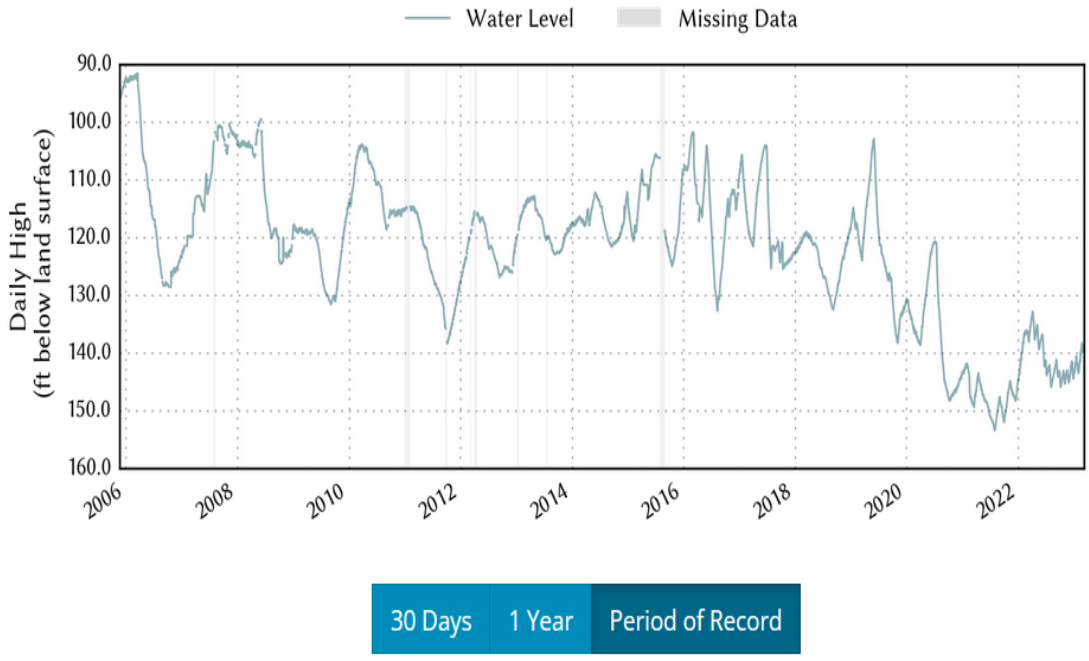


Figure 7: Mount Baldy Well Hydrograph Showing Water Level Depth (ft. below land surface).

6.4. *Management Objective*

Each year, the District will monitor data collected from the U.S. Geological Survey (USGS) water-flow monitoring stations on the Blanco River, Pedernales River, Onion Creek, and at Jacob's Well Spring.

Performance Standard

Each year, the District will review the prior year's monitoring data with local, state, or federal organizations and prepare a summary to be included in the Annual Report.

The Pedernales and Blanco River flow are HTGCD's Drought Indicators. Current conditions of the Drought Indicators are hosted on the Drought Management page of the District website.

Jacobs Well Spring flow is measured monthly for current conditions as a marker for drought curtailment in the JWGMZ.

7. Goal: Addressing Conservation

7.1. *Management Objective*

Each year, the District will submit one article for publication regarding water conservation to at least one newspaper of general circulation in Hays County.

Performance Standard

Each year, a copy of the article submitted for publication will be included in the Annual Report.

The District submitted, appeared in, or provided information in the following articles for publication in the press;

- March 8 -- *Jacobs Well Groundwater Management Zone Moves Into 20% Drought* (Wimberley View)
- April 4 -- *30% Drought Stage in Jacobs Well Groundwater Management Zone* (Wimberley View)
- April 4 -- *Where Does Our Water Come From?* (HCMN Newsletter)
- April 12 – *Groundwater: Planning for the Future* (HCA Newsletter
- May 1 -- *Hays Trinity Groundwater Conservation District Declares Drought* (Wimberley View, Dripping Springs Century News)
- June 16 -- *Removing The Mystery Of Groundwater* (Wimberley View, Dripping Springs Century News)
- July 13 – *High Temperatures Hit The Hill Country* (Dripping Springs Century News)

- July 23 – *Jacob's Well Groundwater Management Zone* (Texas State University/Meadows Center for Water and the Environment)
- July 27 – *RV Resort Receives Water Permit For 200-Plus Sites* (Dripping Springs Century News)
- July 27 -- *Drought Stage Nearing 'Emergency' Without Rain* (Wimberley View)
- July 28 -- *Jacob's Well Has Stopped Flowing Again. That's A Problem For Western Hays County* (KUT News)
- July 31 – *Jacob's Well Stops Flowing Amid Drought* (San Marcos Daily Record)
- August 1 -- *The Hills Have Allies* (Texas Observer)
- August 8 -- *A Message on the Drought from HTGCD General Manager* (WVWA Newsletter)
- August 18 -- *Texas Hill Country Water Crisis May Be Approaching 'Tipping Point,' Experts Warn* (KXAN News)
- September 14 -- *Groundwater Sampling Helps Better Understand Edwards-Trinity Aquifers* (Texas Water Development Board News Film Documentary)
- September 15 – *September Is Done And Another Month Of Insufficient Rain. October Started With The Same Song* (Skyline Ranch Estates WSC Newsletter)
- September 26 -- *Drought Impact At Jacob's Well Tracked By Monitoring Wells* (Fox 7 News)
- October 28 – *The Healing Powers Of Jacob's Well* (Groundwatergovernance Newsletter)
- November 7 -- *Far South Mining LLC v TESPA* (TESPA Newsletter)
- December 29 -- *Critical Drought Conditions Hit The Hill Country* (#1 News Story of the year in the Wimberley View and #2 in the Dripping Springs Century News for 2022)

In addition to press releases, the District maintains a robust Education and Outreach program and serves as a liaison between the Board of Directors, the public, the press, private entities, Universities, and other GCDs or agencies.

- District sponsored Town Hall/Community Workshops
  - Drought Rules Recommendations Workshops (two)
  - Drought Town Hall (Vista Brewing)

- Presentations/Panel Appearances
  - Cypress Creek WPP Speakers series on *The Economics and Future of our Local Groundwater District*
  - Hill Country Master Naturalists class of 2022 on *Hill Country Hydro-Geology 101*
  - Texas State University Dept of Geography Awards Ceremony: *Careers Panel with Dr. Robert Mace and Dr. Andrew Sansom*

- Westcave Roundtable Social: *The Trinity Aquifer:* with Brian Hunt PG (BEG) and Robin Gary (WVWA)
- *Stop the Fitzhugh Concert Venue*: with Commissioner Walt Smith

- Community Engagement
  - Woodcreek Arbor Day (tableing)
  - Dripping Springs Founders Day (tableing)

- ***Water Wise Speaker Series*** with live presentations from
  - *Habitat Enhancing Land Management*: Christine Middleton: Hays County Master Naturalists February 3
  - *Pocket Prairies*: Michelle Bertelsen: Ladybird Johnson Wildflower Center May 3
  - *Neighborhood Scale Rainwater Harvesting*: James Grizzard: Harvest Rain Aug. 4
  - *Winterize Your Well And Rainwater Systems*: James Grizzard: Harvest Rain November 2

- **District Forms** update program

- **Website** completed December 2022

- Maintenance of **2022 Elections Webpage**

- 24 **Social Media** posts

- Act as Liaison for the **Dripping Springs WSC NOAV Settlement Agreement**

- Active communication and collaboration with the **Meadows Center for Water & Environment**

- Active communication and collaboration with various **University of Texas** Schools, and **Texas State University** Departments of Geography and Biology

- Active collaboration with the **Hill Country** Conservation Network and created input for the **Hill Country Natural Infrastructure Plan**

- Active collaboration with the Barton Springs (Travis/Hays Co) **Regional Water Quality Protection Plan** working group (Austin Water, Austin Watershed Protection, SOS, Save Barton Creek Alliance, WVWA, Hays County, Travis County LCRA, BSEACD, SwTCGCD, City of Buda, &tc)

- Active collaboration with the **Hill Country "*One Water*" Delegation** (NBU, SAWS, GBRA, Austin Watershed Protection, Mitchell Foundation, Meadows Center for Water & Environment, City of Buda, Hill Country Alliance, Texas Water Alliance, Texas Water Market Makers)

- Active communication and collaboration with **local/regional water agencies**:
  - Aqua Texas
  - Barton Springs/Edwards Aquifer Conservation District
  - Edwards Aquifer Authority
  - Blanco Pedernales GCD
  - Southwest Travis County GCD
  - Comal County GCD
  - Cow Creek GCD
  - Burnet County GCD
  - Hill Country Underground Water District (Gillespie County)
  - Guadalupe Blanco River Authority
  - Lower Colorado River Authority
  - Wimberley WSC
  - Dripping Springs WSC
  - West Travis Co Public Utility Authority

- Active communication and collaboration with **local/regional conservation non-profits**:
  - Cypress Creek Watershed Protection Program
  - Wimberley Valley Watershed Association
  - Friends of Blue Hole
  - Hill Country Alliance
  - The Nature Conservancy
  - Hill Country Conservancy
  - Hill Country Conservation Network
  - Environmental Defense Fund
  - National Wildlife Federation

8. Goal: Addressing Recharge Enhancement

Due to the geologic and hydro-stratigraphic structure of the Trinity sub-aquifers, the implementation of significantly effective recharge enhancement to the primary source aquifer may not be practical. Current interpretation of geologic data suggests that downward leakage within the Trinity Group is limited to specific stream segments. Recharge takes place within the geographic confines AND west of the District near the sedimentary wedge-edge of the water bearing rock units through diffuse infiltration. Given the location of suspected recharge and its nature, neither general land management nor focused enhancement practices may be feasible. Therefore, until additional Hydrogeologic data is available, this goal is not applicable to the operations of this District.

9. Goal: Addressing Rainwater Harvesting

9.1. *Management Objective*

Each year, the District will make at least one endorsement or contribution to programs that encourage, install, educate, or assist individuals in the implementation of rainwater harvesting systems in the District area.

Performance Standard

Each year, the District will provide records of contributions or promotions of rainwater harvesting events or companies in its Annual Report.

The HTGCD's Water Wise Speakers Series featured the following presentation on rainwater harvesting.

- Neighborhood Scale Rainwater Harvesting: James Grizzard: Harvest Rain Aug. 4

All Water Wise Presentations live on the Districts You-Tube Channel.

The District encourages the use of rainwater collection systems on all new homes, businesses, and existing buildings during every monthly Board Meeting as part of the General Manager's Report.

Additionally, District staff receive TCEQ mailings concerning new business development within the District's boundary. A review of the packets includes direct communication, not only with TCEQ about the project, but also with the developer and their engineer. This includes inquiry about the installation of rainwater harvesting on common buildings or the ability of residents to install rainwater harvesting equipment.

10. Goal: Addressing Precipitation Enhancement

This goal is not applicable to the operations of this District.

11. Goal: Addressing Brush Control

11.1. *Management Objective*

The District will attend or contribute to at least one event each year that promotes and educates the public on proper land management practices.

Performance Standard

Each year, the District will provide records of contributions or promotions of land management events or companies in its Annual Report.

District Staff participated in the Texas Hill Country Conservation Network's *Hill Country Natural Infrastructure Plan*. This project is focused on determining conservation metrics in the Hill Country and advancing conservation measures moving forward.

District staff attend and participate in the monthly Regional Water Quality Protection Program which focuses local agency and NGO capacity on a variety of land management best practices including brush control in the Edwards Aquifer Contributing and Recharge Zone.

District staff promotes recharge of the aquifer through such means as proper brush management and reestablishment of deep-rooted native grasses to promote infiltration into the aquifer during monthly Board Meetings in the General Manager's Report.

The District also provides educational materials for the public to take home on the subject of native plants, rainwater harvesting, aquifer storage and recovery, and other educational topics.

12. Goal: Addressing Desired Future Conditions (DFCs)

12.1. *Management Objective*

The District is working within the framework of Groundwater Management Area- 9 (GMA-9) to upgrade and maintain a well database map and files that will identify all District monitoring wells in the management area. The District will work with GMA-9 and their consultants on an acceptable method to analyze and report drawdown levels relative to the DFC. Deliverables may include potentiometric surface maps of the Middle and Lower Trinity Aquifers and selected hydrographs plus other documents generated by the consultants.

Performance Standard

Each year, the District will review the average drawdown of at least two Trinity Aquifer monitor wells, one in each Planning Region, against the DFC projected average regional drawdown for western Hays County. The District shall provide a summary in its Annual Report.

Texas Regional Water Planning requires that all Districts across the Hill Country Trinity Aquifer work together as a Groundwater Management Area (see **Figure 8**, page 28) to develop and monitor a 50-year aquifer level management goal. This planning goal is known as a Desired Future Condition (DFC). The DFC for the Trinity aquifer-wide is 30-feet of average drawdown over 50-years. The TWDB has scientifically quantified that average drawdown as a volume—and allotted the District 9,098 acre-feet/year of Modeled Available Groundwater (MAG).

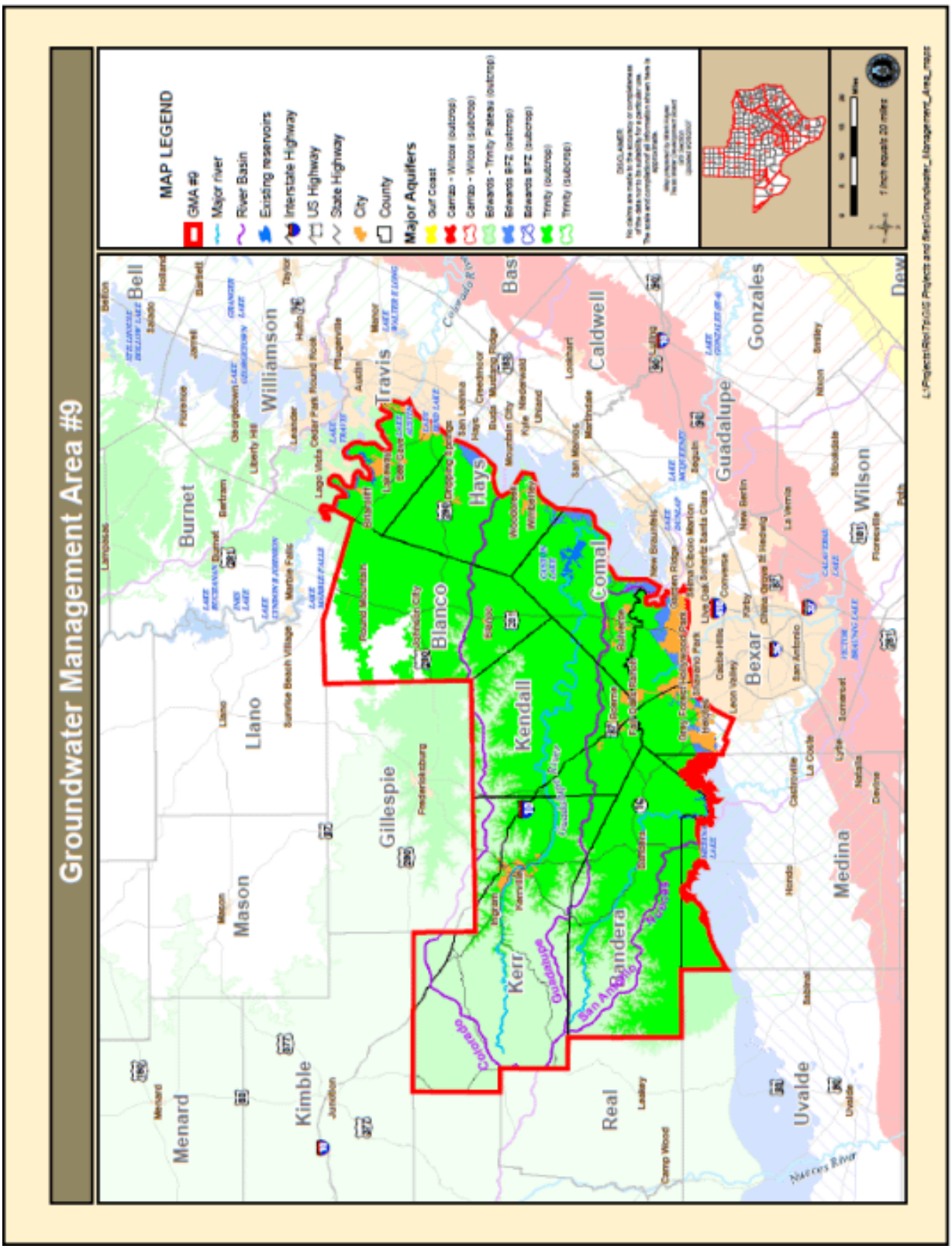


Figure 8: Map of Groundwater Management Area 9

Water Planning Region K: Henly Church Hydrograph

Applying a trendline to the Henly Church Well hydrograph from 2008 – 2022 (the period of interest for DFC analysis) displays slightly decreasing water levels for that period (-2.22 ft./yr.) (**Figure 9**). This would indicate a water level decrease of 31.08 ft. from 2008 – 2022. Evaluating the water level trendline for the entire period of record for this well (1999 – 2022) shows a historical trend that is still negative but has a *larger decrease* of -2.58 ft./yr., resulting in a 59.34 ft. drop in water level over that time period. **Figure 9** demonstrates the difficulties of applying a trend line to a small sample size.

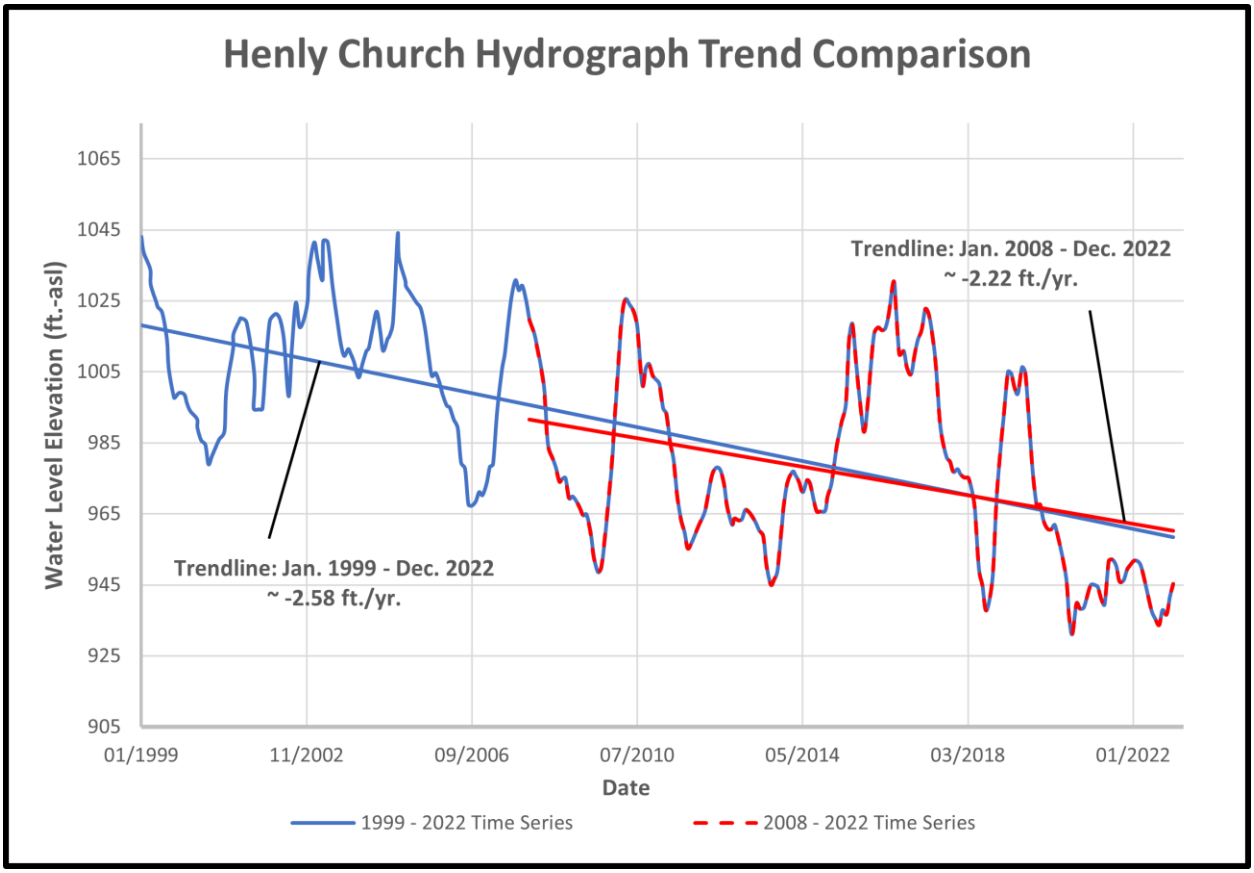


Figure 9: Henly Church well water level trendline comparison showing data from January 1999 to December 2022. The graph shows two trendlines, the blue starting in January 1999, the red starting in January 2008.

Water Planning Region L: Glenn Hydrograph

The Glenn Well hydrograph trendline is negative (decrease in water level over time) at a rate of --0.60 ft./yr. This would indicate a decrease of -8.40 ft. during the 2008 – 2022 time period (**Figure 10**). Like the Henly Church well, the Glenn well experiences large seasonal fluctuations in water level that make accurate assessment of water level trends difficult to conduct. As such, caution should be exercised when using trendlines to evaluate long-term karst aquifer trends.

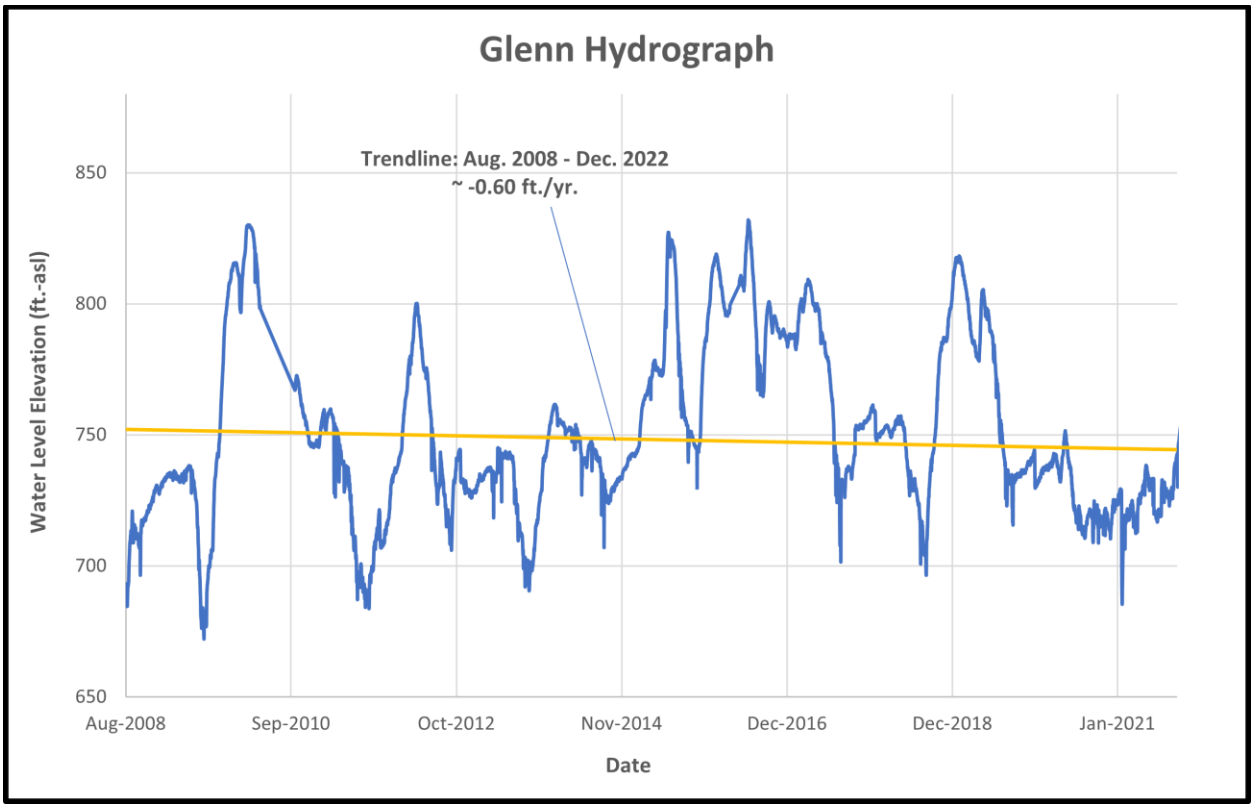


Figure 10: Glenn Well Hydrograph showing the trendline from August 2008 to December 2022.

12.2. *Management Objective*

The Modeled Available Groundwater (MAG) for the Trinity Aquifer in the District is derived from the DFC and requires frequent review against estimated pumpage.

Performance Standard

The District shall prepare an Annual Report of MAG estimated pumpage to monitor District compliance. A summary shall be presented to the District Board and made available to the public and included in the Annual Report.

The Available Groundwater HTGCD Trinity Aquifer System chart (**Table 1**, page 32) has been updated for 2022 and includes estimated exempt use production numbers and actual production reported from non-exempt permit holders from 2009 through 2022. A summary (**Figures 12** and **13**, pages 34-35) was provided to the District's Board of Directors during the annual report presentation. Special attention should be given to the following data:

During 2022, 149 new wells were registered within the District boundary. 145 of them are exempt wells. Using 330 gallons per day, calculations show that 51 acre-ft/year will be produced on average from the newly added 145 exempt wells. The total exempt use for domestic and agriculture use during 2022 was estimated to be 3,859 acre-ft.

The total permitted "non-exempt use" during 2022 is 3,574[4] acre-feet, which includes an estimated 100 acre-feet of non-permitted non-exempt use. The sum of "non-exempt use" (3,574 acre-feet) and "exempt use" (3,859 acre-feet) allocated as of end of 2022 is 7,433 acre-feet. Actual 2022 non-exempt production reported to the District totaled 2,523 acre-feet.

Extrapolating a linear trend based on the previous 5-years of data, permitted plus exempt use will exceed the MAG (9,098 acre-feet per year) in 2032 (**Figure 11**).

The Texas Water Development Board set the Hays Trinity Groundwater Conservation District's total MAG (Modeled Available Groundwater) at 9,098 acre-feet. As of 2022, the District has committed 7,443 acre-feet. The remaining 1,665 acre-feet must be distributed between future new exempt and non-exempt commitments.

[4] Careful scrutiny of Table 1 will reveal a net 463 a-f decrease in non-exempt water allocation between 2021 and 2022. This net decrease includes the addition of new permits in 2022 and the scrubbing of a defunct 500 a-f permit.

Available Groundwater HTGCD-Trinity Aquifer System as of December 31, 2022 (Acre-Feet/Year, AFY)

	Year-End 2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Modeled Available Groundwater[1]		**9,109**	**9,109**	**9,109**	**9,109**	**9,109**	**9,109**	**9,109**	**9,109**	**9,109**	**9,109**	**9,098**	**9,098**	**9,098**
Exempt Use: Domestic/Agricultural	[2]3,300	3,322	3,358	3,398	3,448	3,495	3,542	3,577	3,616	3,663	3,716	3,758	3,809	3,859
Non-Exempt Use: Permitted[3]	1,860	1,877	2,442	2,451	2,854	2,989	3,310	3326	3,545	3,741	3,903	3,924	3,931	3,474
Non-Exempt Use: No Permit -Estimated[4]	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Non-Exempt Use: Reporting - No Permit[5]	482	364	306	235	19	2	3	4	0	0	0	0	0	0
Sub-Total Committed	5,742	5,663	6,206	6,184	6,421	6,586	6,955	7,007	7,261	7,504	7,719	7,782	7,840	7,433
Net Available Groundwater (MAG-Sub-Total)		3,446	2,903	2,926	2,688	2,523	2,154	2,102	1,848	1,605	1,390	1,316	1,258	1,665
Non-Exempt Actual Production	1,987	1,796	2,004	1,691	1,599	1,532	1,537	1,586	1,815	1,904	1,940	2,231	2,049	2,523

2009 : 99 new Well Construction Notifications or 37AFY
2010 : 59 new Well Construction Notifications or 22 AFY
2011 : 96 new Well Construction Notifications or 36 AFY
2012 : 107 new Well Construction Notifications or 40 AFY
2013 : 135 new Well Construction Notifications or 50 AFY
2014 : 126 new Well Construction Notifications or 47 AFY
2015 : 127 new Well Construction Notifications or 47 AFY
2016 : 95 new Well Construction Notifications or 35 AFY
2017 : 105 new Well Construction Notifications or 39 AFY
2018 : 126 new Well Construction Notifications or 47 AFY
2019 : 144 new Well Construction Notifications or 53 AFY
2020 : 115 new Well Construction Notifications or 42 AFY
2021 : 137 new Well Construction Notifications or 51 AFY
2022 : 127 new Well Construction Notifications or 47 AFY

[1] TWDB-calculated MAG pumping decreases over time, and incorporates assumptions on future use
[2] Approved by the HTGCD Board April 25, 2011 based on the HDR NA Case 5,784 (Water-Wastewater Plan for Hays Co., 2011)
[3] Total AFY permitted for pumping in existing operational permits
[4] Non-Exempt Use: not permitted and not reporting; Goal: permit users and move 100 AFY towards 0 AFY*)
*)10 AFY calculated: Identified & Under Investigation = 50 cases @ 2 AFY each = 100 AFY
[5] Non-Exempt Use: reporting but not permitted; Goal: permit users and move 4 AFY towards 0 AFY

Numbers at a Glance

Total Registered non-exempt wells:	112
Total Registered exempt wells (estimated):	2,167
Total monitor wells:	60
Total registered producing wells:	**2,279**
Utility Connections:	9,382
Total Volume **permitted** (estimated):	3,574
Total non-exempt produced, AFY:	2,523
Total exempt use (estimated, AFY):	3,859
Total **produced** (estimated, AFY):	6,382
Total Modeled Available Groundwater, AFY:	**9,098**

Table 1: Modeled Available Groundwater in the Trinity Aquifer System within the Hays Trinity GCD Jurisdiction.

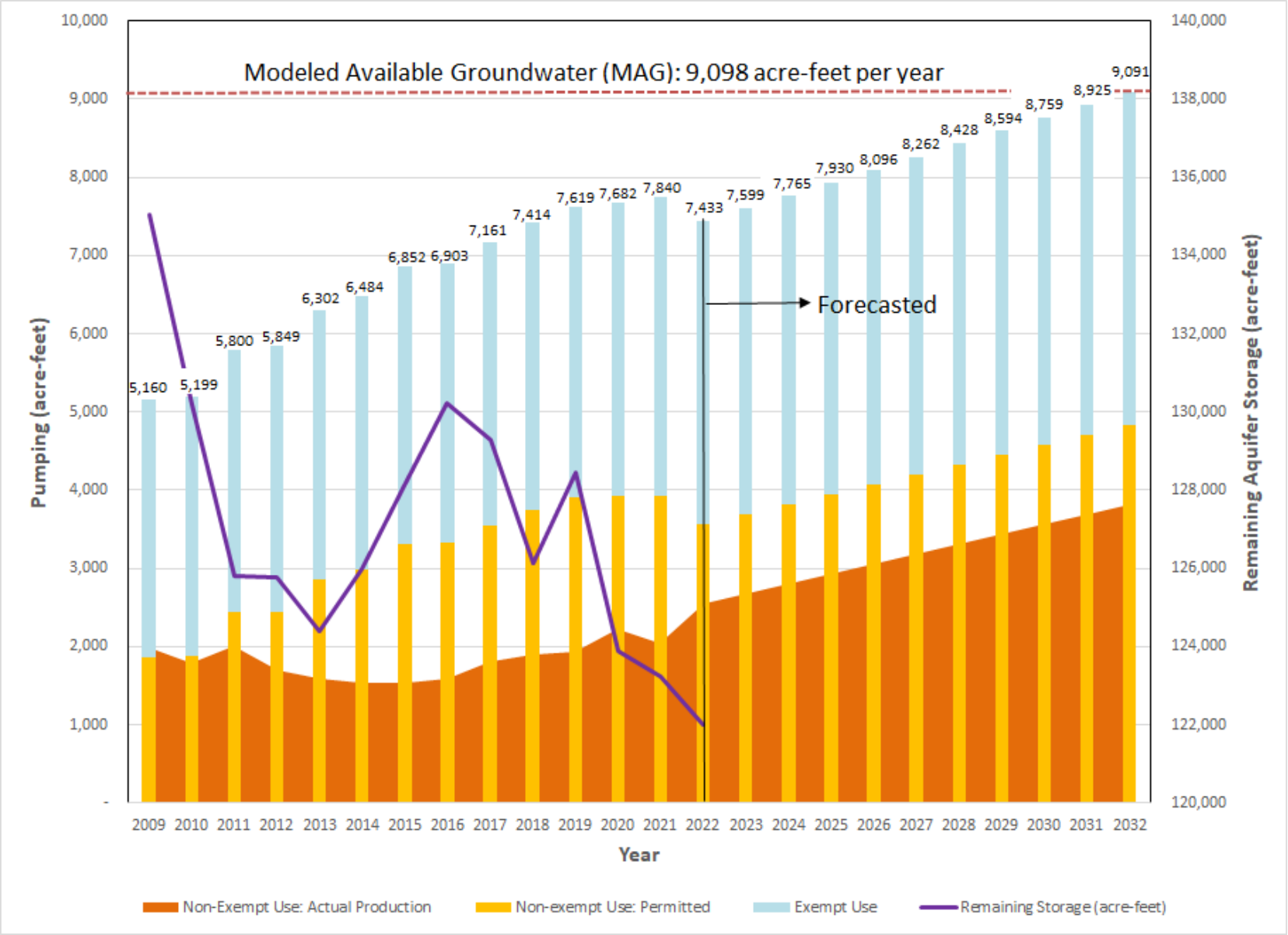


Figure 11: Estimated Exempt and Non-exempt Historical Groundwater Use. The Forecast is a Linear Extrapolation of the 2017-2021 Data in **Table 1**.

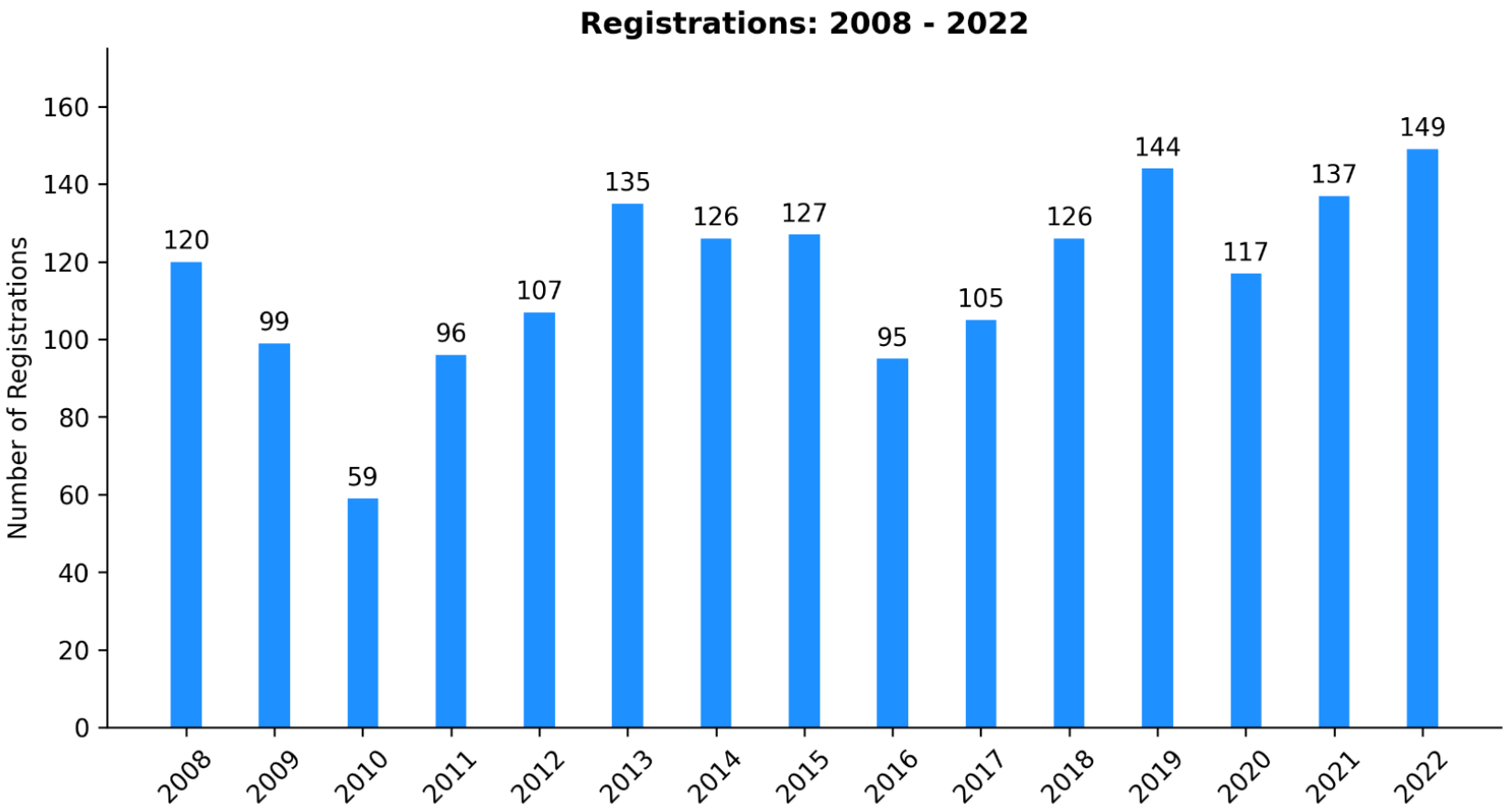


Figure 12: Wells Drilled by Year, Including Geothermal and Non-producing Monitoring Wells

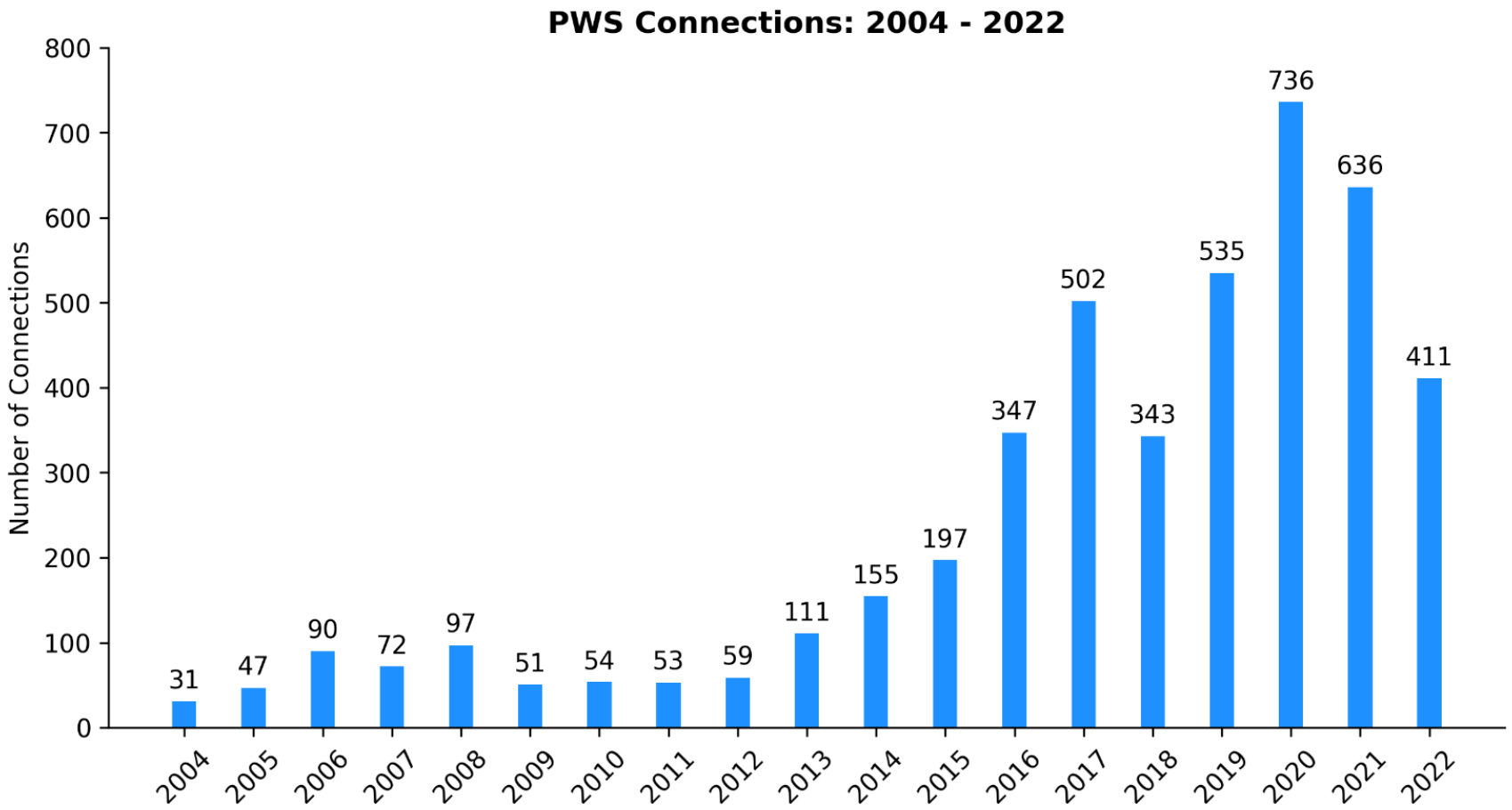


Figure 13. Public Water Supply Connections by Year.

Appendix:

Section 1.	Board Meeting and Public Hearing Agendas √
Section 2.	Manager, Science, New Wells & Connections Reports √
Section 3.	Drought Support Documents, Orders, Resolutions √
Section 4.	Financial Statement, Mitigation Fund, 2021 Audit Summary √
Section 5.	Project Reports √
Section 6.	Rainwater Harvesting Support Documents √
Section 7.	Newspaper Articles and Press Releases √
Section 8.	Review of Professional Services √

References:

Martin, N.M., Green, R.T., Nicholaides, K.D., Fratesi, S.B., Nunu, R.R., and Flores, M.E, 2019, Blanco River Aquifer Assessment Tool: A Tool to Assess How the Blanco River Interacts with Its Aquifer: Creating the Conceptual Model. Technical Report prepared for the Meadows Center for Water and the Environment. Texas State University at San Marcos, Texas. 136 p. + attachments.

Dowlearn, G., 2022, GAM Run 21-014 MAG: Modeled Available Groundwater for the Aquifers in Groundwater Management Area 9, Texas Water Development Board, 26 p.

HDR Engineering Inc., 2011, Water And Wastewater Facilities Plan For The Portion Of Hays County West Of The IH-35 Corridor

SECTION 1: (See Agendas/Minutes Appendix in Z/Docs/AnnualReports/2022/)

SECTION 2: (see Monthly Science Reports Appendix folder)

Ten Largest Permits						
Permittee	Permitted (gal)	Permitted (Drought Adjusted) (gal)	Pumped (gal)	Annual Overage	Avg. Monthly Overage (JWGMZ)	Avg. Loss
Dripping Springs WSC	366,582,375	277,136,276	274,418,000	0.00%	N/A	9.88%
Wimberley WSC	140,115,930	105,927,643	170,063,000	60.55%	N/A	17.48%
- WWSC Well #6 (JWGMZ)	70,057,965	43,283,328	36,103,173	N/A	1.95%	Unknown
Woodcreek Phase II - Aqua Texas	110,463,489	64,812,288	121,988,800	N/A	**93.94%**	**30.69%**
Woodcreek Phase I - Aqua Texas	52,299,086	39,538,109	77,176,600	**95.20%**	N/A	23.35%
- WCI Well #11 (JWGMZ)	52,299,086	27,593,520	19,984,000	N/A	14.98%	Unknown
Wimberley Springs Partners Ltd.	81,462,750	14,157,372	9,422,200	N/A	7.85%	0.00%
La Ventana Subdivision	39,753,822	30,053,889	31,583,560	5.09%	N/A	7.28%
Goldenwood West WSC	19,551,060	14,780,601	12,595,000	0.00%	N/A	10.24%
Mountain Crest / Aqua Texas	17,595,954	7,731,449	12,173,000	N/A	59.35%	11.08%
River Oaks Ranch- Monarch Utilities	16,292,550	12,317,168	9,154,000	0.00%	N/A	6.99%
Cedar Oak Mesa WSC	11,730,636	8,868,361	8,993,000	1.41%	N/A	12.92%
Sum of JWGMZ monthly curtailments. Overages NOT assessed based on this number						
Red numbers are overages						
Bold numbers are extreems						

SECTION 3 (see Orders/Resolutions Appendix folder)

SECTION 4 (see Financial Appendix folder)
2022 Budget
2022 Financial Report
2022 Detailed Profit-Loss Statement
2022 Investment Reports
2021 Audit

SECTION 5

Reports

- Monthly Reports
  - *Status of Drought Report*
  - *Well Level Report*
  - *Temperature/Rainfall Forecast*
  - *Public Water Supply Connection Report*
  - *Well Construction Notification Report*
  - *Science Report*
  - *Manager's Report*
  - *Quarterly Investments Report*
  - *Annual Report*
  - *TWDB Management Plan*

- Science Reports

- *Evaluating Compliance With the Desired Future Conditions Within Hays Trinity Groundwater Conservation District* (Boghici)
- *Strontium in Groundwater Within Hays Trinity GCD Report and Map* (Boghici)
- *Evaluating Aquifer Saturated Thickness as a Replacement for the Percentile Water Level Map* (Boghici)
- *Potential MAG/DFC Achievement Projection Through Various Population & Policy Scenarios* (Webster, Boghici)
- *HTGCD Drought Trigger Methodology* (Boghici)
- *Barton & Fitzhugh Creek Blue Dye Spill Report* (Boghici, Flatten)
- *Aqua Texas Sewage Spill onto the Romano Property* (Flatten, Webster)
- *Special Study Zone (Rule 16): Aquifer Level Analysis* – ongoing (Webster, Boghici, Flatten)
- *Mirasol Water Availability Study* -- ongoing (Webster, Boghici, Flatten)
- *Mirasol Water Availability Study* -- ongoing (Oliver, et. al.)
- *Surface Water/Groundwater Interactions Along Barton Creek* – ongoing (Webster, Boghici, Flatten)
- ~~*Little Blanco River Gain-Loss Study* -- ongoing (Wierman, Walker, Webster, Boghici) →~~moved under 'science reports by others' below
- *Potentiometric Surfaces of the Lower and Middle Trinity Aquifer in Southwestern Hays County, Texas* (Webster, Boghici)
- *District Drought Trigger Methodology: Technical Evaluation; Plus 4-5 PowerPoint DTM Presentations For Stakeholders And Board* (Boghici)
- *Identifying The Source Of Young Groundwater Fraction In Lower Trinity Samples* (Boghici)

o *Science Reports by others using HTGCD data and resources*
- *Preliminary Report on the Installation of Two Multilevel Monitor Wells Near Jacob's Well:* BSEA/CD (Smith, Watson, Camp)
- *Hydrogeologic Investigations of the Trinity Aquifers in Western Travis County along a Portion of Lake Travis and a Transect from Northern Hays County to Bell County, Central Texas:* BEG (Hunt, Cockrell, Smith)
- *Little Blanco River Gain-Loss Study* -- ongoing (Wierman, Walker)

o Policy Reports
- *Desired Future Condition (DFC) Computation Methodologies Utilized by Texas Hill Country Groundwater Conservation Districts* (Flatten)
- *Hill Country GCD Survey on Well Spacing Rules* (Flatten, Boghici)
- *Water Quality Protection: Groundwater Conservation District Responsibilities and Obligations in Texas* (Fults)
- *HTGCD Drought Management Policy Review* (Flatten)
- *HTGCD Drought History Report* (Flatten)
- *HTGCD Fee & Penalty Audit* (Flatten)
- *HTGCD Statement of Purpose* (Flatten)
- *JWGMZ Development Guide* (Flatten)
- *HTGCD Fee & Penalty Schedule: 2022 Audit* (Flatten)

- *Hill Country GCD Fee & Penalty Report* (Flatten)
- *2022 Well Registration and New Permit Pilot Program* (Flatten)

Guidance, Planning, and Stakeholder Group Membership

- Aqua/JWGMZ Production Redistribution Planning Group (Via WVWA)
- Hill Country Trinity Aquifer Groundwater Management Area-9 (TWDB GMA-9)
    - GMA-9 2026 Joint Regional Planning: Technical Committee
    - GMA-9 2026 Joint Regional Planning: Public Outreach Committee
- South Central Texas Regional Water Planning Group (TWDB Region L)
- Lower Colorado Regional Water Planning Group (TWDB Region K) (Alternate voting member)
- Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas and San Antonio Bays -- Stakeholder Committee (TCEQ BBASC)
- Environmental Defense Fund: GMA-9 / 2026 DFC Working Group (technical advisor)
- Texas Hill Country Conservation Network -- Hill Country Natural Infrastructure Plan Advisory Team
- Barton Springs/Edwards Aquifer Regional Water Quality Protection Plan -- Working Group
- Cypress Creek Watershed Protection Program -- Executive Committee
- Texas Association of Groundwater Districts -- Legislative Committee
- Regional Planning (GMA)/ DFC Subcommittee
- Texas Hill Country Conservation Network -- Water Team (Founding Lead 2018-2019)
- Hays County Groundwater Modeling Taskforce BRAAT Initiative
- Texas Water Research Network – (UT Austin: Environmental Science Institute)
- Austin Community College - Environmental Science & Tech Advisory Committee

SECTION 6

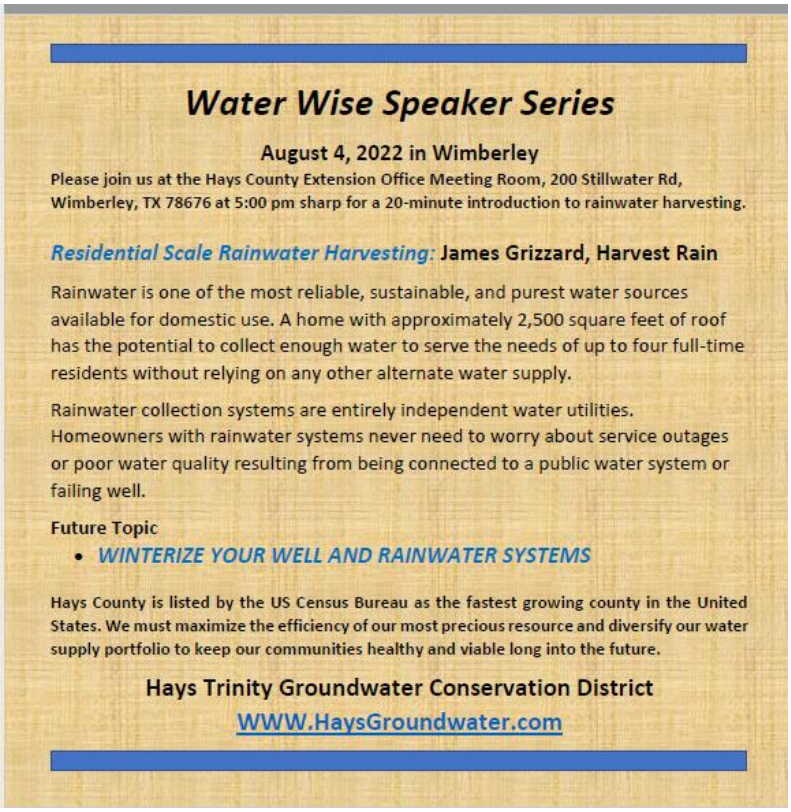
The District's preferred sustainable water supply solution for Western Hays County and the Hill Country is Rainwater Harvesting (RWH). While it recognizes that RWH is not a solution for everyone, most homes and businesses can supplement or even rely on RWH for 100% of their demands.

As such, the Hays Trinity Groundwater Conservation District supports RWH educational events and advises utilization of that strategy at every available opportunity.

Below is a list of events attended or hosted by the District:

2022 Dripping Springs Founders Day Festival

2022 Water Wise Speaker Series



Water Wise Speaker Series

August 4, 2022 in Wimberley

Please join us at the Hays County Extension Office Meeting Room, 200 Stillwater Rd, Wimberley, TX 78676 at 5:00 pm sharp for a 20-minute introduction to rainwater harvesting.

Residential Scale Rainwater Harvesting: **James Grizzard, Harvest Rain**

Rainwater is one of the most reliable, sustainable, and purest water sources available for domestic use. A home with approximately 2,500 square feet of roof has the potential to collect enough water to serve the needs of up to four full-time residents without relying on any other alternate water supply.

Rainwater collection systems are entirely independent water utilities. Homeowners with rainwater systems never need to worry about service outages or poor water quality resulting from being connected to a public water system or failing well.

Future Topic

- ***WINTERIZE YOUR WELL AND RAINWATER SYSTEMS***

Hays County is listed by the US Census Bureau as the fastest growing county in the United States. We must maximize the efficiency of our most precious resource and diversify our water supply portfolio to keep our communities healthy and viable long into the future.

Hays Trinity Groundwater Conservation District

WWW.HaysGroundwater.com

2022 Drought Town Hall Meeting

SECTION 7 (see Press release Appendix folder)

SECTION 8:

2022 Assessment of Professional Services

In order to maintain professional standards while remaining within personnel budgetary limitations, the Hays Trinity Groundwater Conservation District (District) contracts with professional service providers for a variety of tasks.

Section 4.2 (A) 3 of the District's Bylaws require an assessment of those services.

Accounting
The District's Bookkeeping services are provided by Sheila Holt and staff. Ms. Holt provides bookkeeping services including monthly and annual financial statements, quarterly and annual tax filings, and payroll at an hourly rate. Staff executes all banking,

check writing, and accounts payable & receivable duties. The Board Treasurer oversees all financial documents, annual budget generation, and acts as a reasonable and required supervisor of accounts.

Audit
Neffendorf & Blocker, PC provides the District's annual auditing services. They are historically punctual and thorough. The 2021 Audit is complete and without issue.

Hydrogeologic
The District acknowledges the critical and excellent geologic service provided by staff. The District relies on its in-house professional geoscientists to perform a variety of scientific data gathering and assessments. The District lost its PGIT to consultancy in early 2022 and replaced him with a seasoned Geoscientist Radu Boghici. Mr. Boghici came to us on retirement from TWDB's Groundwater Availability Modeling shop with a MS in geosciences from UT and years of experience in the field and in the lab. The District continues to benefit from the exemplary and pro-bono work done by Al Broun PG prior to 2020.
The District partnered with the Southwestern Travis County GCD in hiring INTERA Geosciences to render static model runs to support permitting decisions on the Mirasol Springs (Clancy Holdings) permit applications.

Legal
Greg Ellis of Ellis Law is the District's long-time Legal consultant. Mr. Ellis provides technical legal counsel on the District's legal questions and is paid on an hourly basis. Mr. Ellis provides contract intergovernmental-relations services at the State Legislature.
Lloyd Gosselink Rochelle & Townsend, P.C., and Deborah Trejo of Kemp Smith Law provide legal counsel on an as needed basis as well.
Allison, Bass, and Magee LLP provided legal assistance to the District's decennial redistricting requirements in 2022.