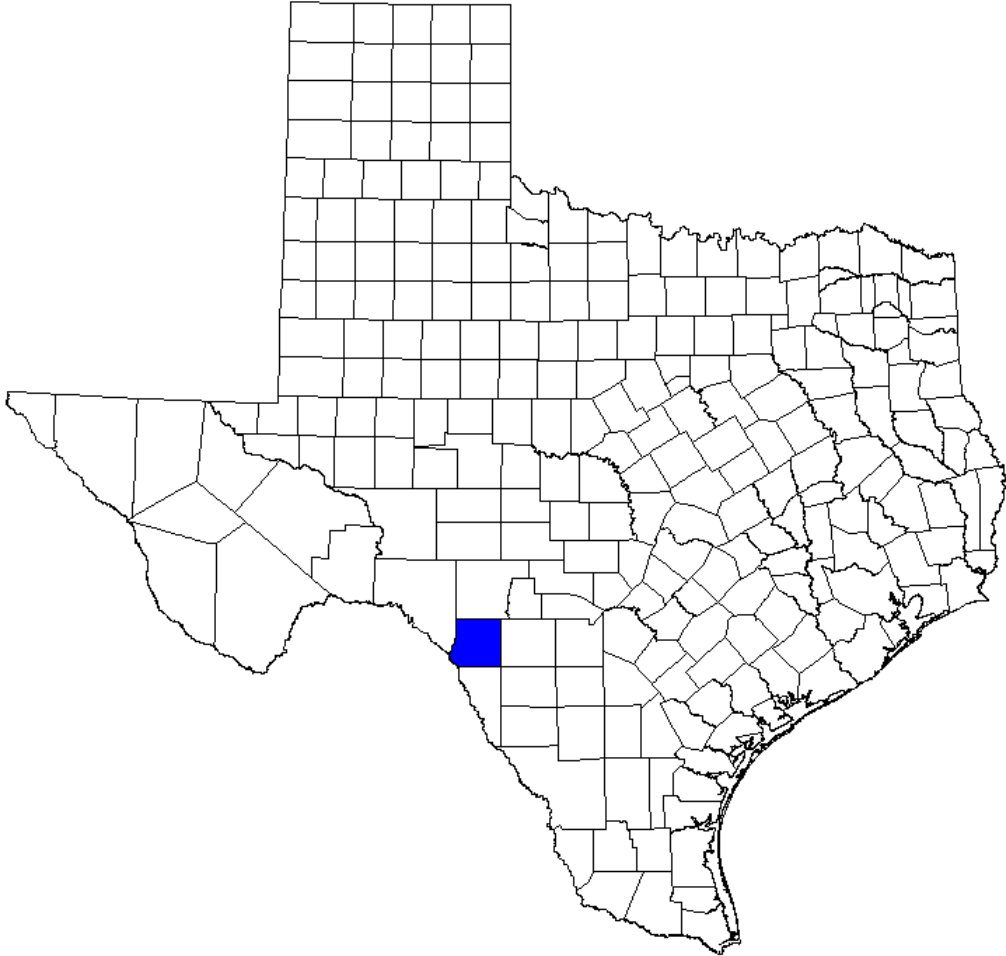


**Kinney County Groundwater Conservation District  
Groundwater Management Plan - 2023**



*Final Approved Plan*

**January 18, 2023**

# Kinney County Groundwater Conservation District Groundwater Management Plan - 2023

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## **1.0 District Mission**

The mission of the Kinney County Groundwater Conservation District is to develop, promote and implement water conservation and management strategies to conserve, preserve, and protect the groundwater supplies of the District, to protect and enhance recharge, prevent waste and pollution, and to promote efficient and beneficial use of groundwater within the District.

The District strives to strike a balance between conservation, preservation, efficient and beneficial use of groundwater, along with protection private property rights of landowners...all for the benefit of citizens/landowners of Kinney County...not only now, but for future generations.

## **2.0 Purpose of Management Plan**

The Plan is developed to provide general guidelines for the development of the District rules and implementation of policies to support the District's mission. The purpose of this Management Plan is to provide guidance to the District for:

### **A. Managing the Production of Groundwater in the District**

1. on a sustainable basis;
2. for beneficial use;
3. that allows the capture of water flowing through the county;
4. without jeopardizing the availability of water to the county during extended periods of low rainfall; and
5. without unduly increasing the frequency of the natural cycles of springs and intermittent streams going dry.

### **B. Resolving Conflicts of Groundwater Use Between the Various Interests Seeking to Put This Essential Natural and Renewable Resource To Beneficial Use**

### **3.0 District Information**

#### **3.1 District Creation**

In 2001, the Texas Legislature authorized the creation of the District during the 77<sup>th</sup> Regular Session through House Bill 3243 (Act of May 25, 2001, 77th Leg., R.S. ch. 1344, 2001 Tex. Gen. Laws 3329). The voters of Kinney County confirmed the creation of the District on January 12, 2002 with 87 percent of the voters casting favorable ballots.

#### **3.2 Location and Geographical Information**

The District is located in Kinney County, Texas. The boundaries of the District are the same boundaries that are used by Kinney County. Kinney County is in southwestern Texas and is bounded on the north by Edwards County, on the east by Uvalde County, on the south by Maverick County, and on the west by Val Verde County and Mexico. Kinney County has an area of 891,240 acres (1,391 square miles). Brackettville is the county seat and the largest town in the county.

#### **3.3 Authority / Regulatory Framework**

In the preparation of this Management Plan, the District has followed all procedures and satisfied all requirements mandated by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's (TWDB) rules contained in Title 31 of the Texas Administrative Code. The District exercises the powers that it was granted and authorized to use by and through the special and general laws that govern it, including Chapter 36, as amended, Texas Water Code. The District will collaborate with surrounding counties, Mexico and other groundwater conservation districts, groundwater management areas, and regional planning areas.

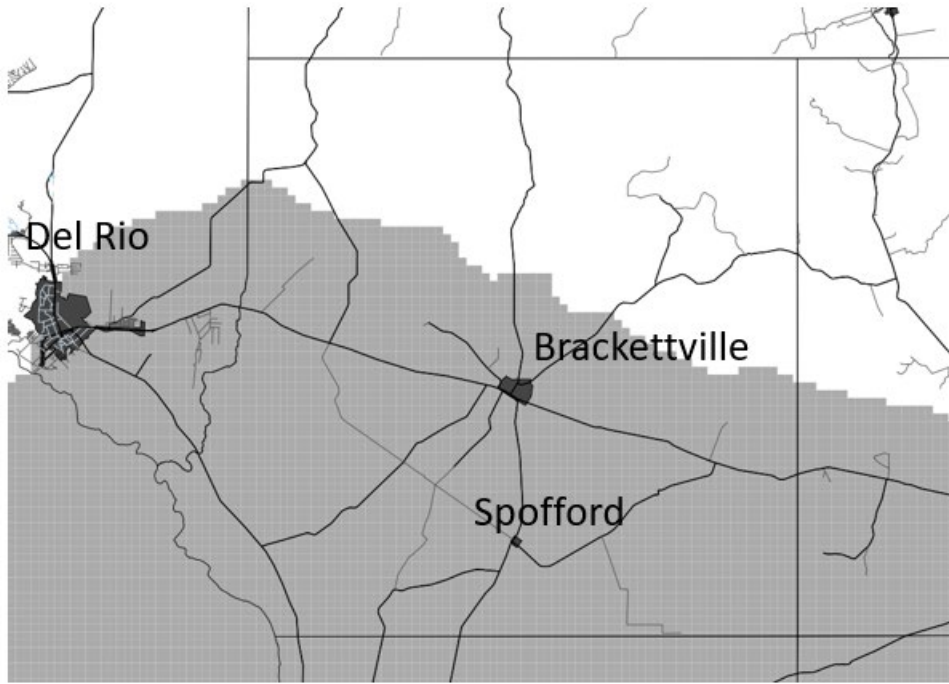
The 75<sup>th</sup> Texas Legislature in 1997 enacted Senate Bill 1 (SB 1, Act of June 2, 1997, 75th Leg. R.S., ch. 1010, 1997 Tex. Gen. Laws 3610). SB 1 established a comprehensive statewide water planning process and contained provisions which required groundwater conservation districts to formulate management plans to identify the water supply resources and water demands that will shape the decisions of each district. The management plans for the groundwater conservation districts also include the management goals that each district would establish to manage and conserve the groundwater resources within their boundaries.

#### **3.4 Groundwater Resources of Kinney County**

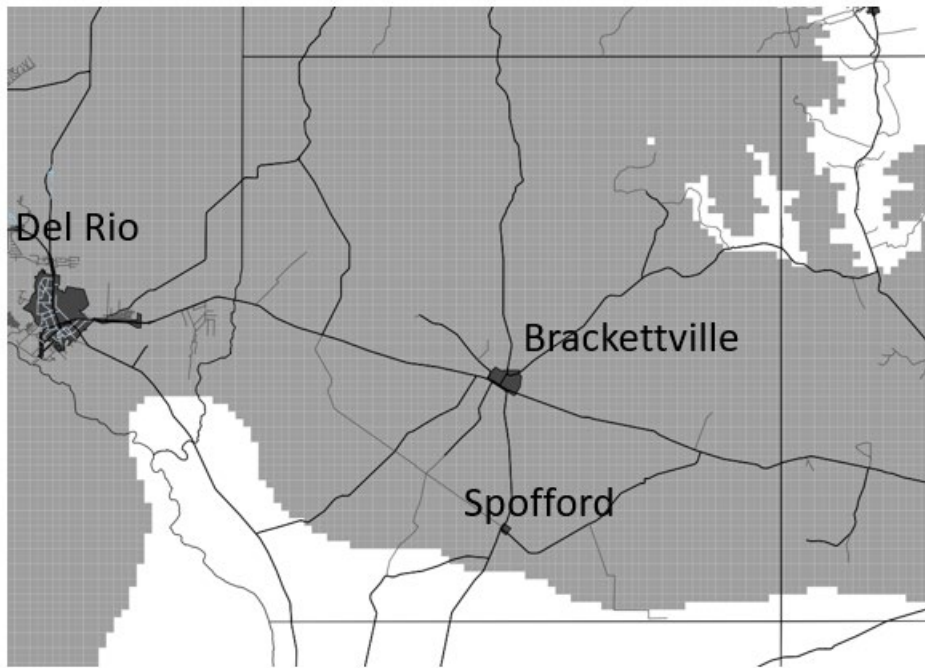
Groundwater in Kinney County generally occurs in three groups of Cretaceous rocks (youngest formations to oldest formations):

- Upper Cretaceous rocks (Austin Chalk and Buda Limestone)
- Edwards Limestone
- Trinity rocks (Glen Rose limestone)

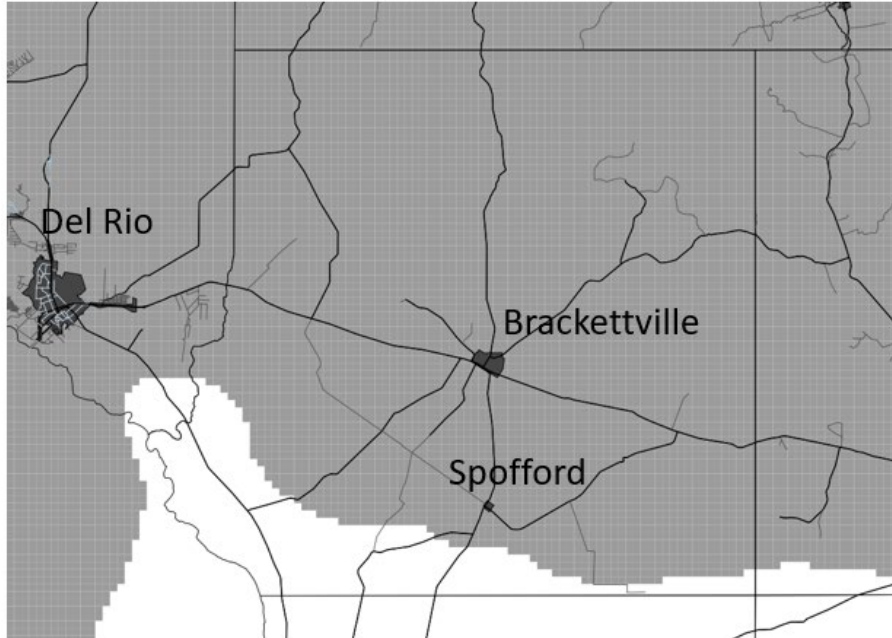
The geographic extent of each of these groups in Kinney County is presented in Figures 1, 2, and 3.



**Figure 1. Upper Cretaceous Rocks**



**Figure 2. Edwards Limestone**

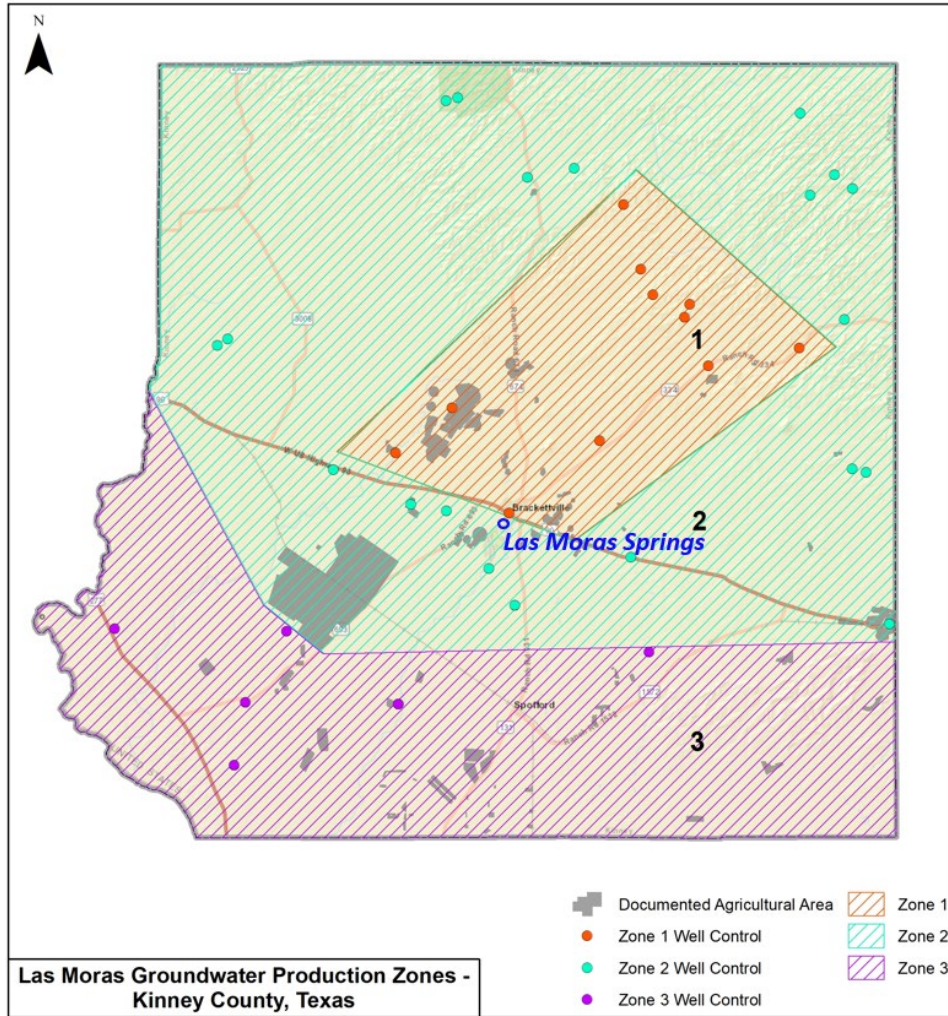


**Figure 3. Trinity Rocks**

Groundwater in Kinney County is recharged from rainfall. The groundwater monitoring program that the Kinney County Groundwater Conservation District initiated in 2013 demonstrates that precipitation events and increasing groundwater levels are correlated. Generally, groundwater levels rise after precipitation events. The monitoring data also generally show that groundwater levels decline during periods with no precipitation. This filling and draining of the aquifers in Kinney County also correlates with increasing and decreasing flow at Las Moras Springs. Based on an analysis of spring flow and groundwater levels from the monitoring network, three zones have been identified:

- Zone 1: Strong correlation between spring flow and groundwater levels
- Zone 2: Moderate correlation between spring flow and groundwater levels
- Zone 3: Weak or no correlation between spring flow and groundwater levels

Figure 4 shows the location of the monitoring points and Las Moras Springs. Please note that the well locations are color coded to the designated zone. Details of the analysis associated with zone definition are presented in Appendices A-1, A-2, and A-3.



**Figure 4. Zones of Correlation between Las Moras Springs Flow and Groundwater Levels**



## **4.0 Technical Information Required by Texas Administrative Code**

The information in this section is provided pursuant to statutes and rules as summarized in the TWDB Groundwater Conservation District Management Plan Checklist (dated December 6, 2012). The information is organized according to the order in the checklist.

### **4.1 Estimate of the Modeled Available Groundwater**

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”.

Kinney County Groundwater Conservation District is within the boundaries of two Groundwater Management Areas: GMA 7 and GMA 10. The presentation and discussion of the modeled available groundwater for Kinney County for the GMA 7 portion of Kinney County and the GMA 10 portion of Kinney County are presented separately below.

#### **4.1.2 GMA 7 Portion of Kinney County**

GMA 7 adopted a desired future condition for Kinney County on August 19, 2021:

*In Kinney County, that drawdown which is consistent with maintaining, at Las Moras Springs, an annual average flow of 23.9 [cubic feet per second] and a median flow of 24.4 [cubic feet per second] based on Scenario 3 of the Texas Water Development Board’s flow model presented on July 27, 2010.*

The desired future condition was adopted after considering a set of alternative model simulations. Scenario 3 of that set of simulations was the basis of the adopted desired future conditions, as referenced in the resolution of GMA 7. Scenario 3 (and other alternative runs) is documented in TWDB Draft GAM Task 10-027 (Revised), dated February 9, 2011, which is attached as Appendix B to this plan.

The modeled available groundwater was calculated by the Texas Water Development Board and was provided in GAM Run 21-012 MAG, dated August 11, 2022, which is attached as Appendix C to this plan. The modeled available groundwater for the Edwards-Trinity (Plateau) Aquifer for the GMA 7 portion of Kinney County is 70,341 acre-feet per year.

#### **4.1.3 GMA 10 Portion of Kinney County**

GMA 10 adopted DFCs on October 26, 2021. However, to date, TWDB has sent a letter finding the submittal package administratively complete but has not issued an updated MAG report. The following represent the second-round DFCs and MAGs. The DFC adopted on October 26, 2021 is the same as the second round DFC, and the MAG is not expected to change.

GMA 10 adopted a desired future condition for Kinney County on October 26, 2021:

*The water level in well number 70-38-902 shall not fall below 1184 feet mean sea level*

The modeled available groundwater was calculated by the Texas Water Development Board and was provided in GAM Run 16-033 MAG, dated July 20, 2018, which is attached as Appendix D to this plan. The modeled available groundwater for the Edwards-Trinity (Plateau) Aquifer for the GMA 10 portion of Kinney County is 6,321 acre-feet per year for decades 2010 through 2060.

#### **4.2 Estimate of the Amount of Groundwater Being Used Within District on an Annual Basis**

Please refer to Appendix E: Estimated Historical Use and 2022 State Water Plan Datasets, Kinney County Groundwater Conservation District.

#### **4.3 Estimate of the Annual Amount of Recharge from Precipitation**

Please refer to Appendix F: GAM Run 22-011, Kinney County Groundwater Conservation District Management Plan.

#### **4.4 Estimate of the Annual Volume of Water That Discharges to Springs and Surface Water Bodies**

Please refer to Appendix F: GAM Run 22-011, Kinney County Groundwater Conservation District Management Plan.

#### **4.5 Estimate of the Annual Volume of Flow into the District, out of the District, and between Aquifers**

Please refer to Appendix F: GAM Run 22-011, Kinney County Groundwater Conservation District Management Plan.

#### **4.6 Estimate of the Projected Surface Water Supply within the District**

Please refer to Appendix E: Estimated Historical Use and 2022 State Water Plan Datasets, Kinney County Groundwater Conservation District. These estimates show the only surface water supplies are run-of-the-river from the Rio Grande for irrigation (3,616 AF/yr).

#### **4.7 Estimate of the Projected Total Demand for Water within District**

Please refer to Appendix E: Estimated Historical Use and 2022 State Water Plan Datasets, Kinney County Groundwater Conservation District. These estimates were updated to reflect plumbing code savings found in Regional and State Water Plans. The sum of total demands are relatively constant (5,227 AF/yr in 2020 to 5,199 AF/yr in 2070).

#### **4.8 Water Supply Needs**

Please refer to Appendix E: Estimated Historical Use and 2022 State Water Plan Datasets, Kinney County Groundwater Conservation District. These estimates show that for seven of the eight categories listed, there is a projected surplus. The only listed need (deficit) is for livestock supply in the Nueces River Basin portion of Kinney County, and the listed need is small (27 AF/yr).

#### **4.9 Water Management Strategies**

Please refer to Appendix E: Estimated Historical Use and 2022 State Water Plan Datasets, Kinney County Groundwater Conservation District.

Page 7 of the Appendix E includes two specific groundwater-related water management strategies for Kinney County:

- An increase in the supply to Spofford (from City of Brackettville) with a new water line and storage of 6 AF/yr starting in 2030.
- An increase in storage facilities for Fort Clark Springs MUD of 620 AF/yr starting in 2030.

The third water management strategy is an anticipated demand reduction of 79 AF/yr resulting from a water loss audit and min-line repairs for Fort Clark Springs MUD.

These specific water management strategies were considered and included in the overall preparation of this management plan.

#### **4.10 How the District Will Manage Groundwater Supplies**

Kinney County Groundwater Conservation District will manage the production of groundwater in Kinney County in a sustainable manner. The adopted desired future conditions for both Groundwater Management Area 7 and Groundwater Management Area 10 represent long-term planning goals for the district.

The desired future conditions are linked to sustainable management via maintaining spring flow at historic amounts (GMA 7) and avoiding a specific threshold groundwater elevation (GMA 10). The threshold well used for the desired future condition in GMA 10 exhibits strong correlation with spring flow on an annual basis.

As developed in this management plan in Section 5.8, Las Moras Springs flow will be higher than the long-term average during wet periods and will be lower than the long-term average during dry periods. The review of spring flow and precipitation is completed annually. If the spring flow is outside the bounds of expected spring flow given the annual precipitation in the previous year, the District will consider a range of management options.

- Analyze the inconsistency with updated data and information from ongoing hydrogeologic studies to determine if the inconsistency is significant.
- Update the management goal with updated data and information that were not available at the time of the development of this management plan.
- Based on updated data and information from ongoing hydrogeologic studies, evaluate the need for pumping reductions, as appropriate, from a technical perspective and from a legal/property rights perspective.

In general, the District may develop and implement groundwater well spacing and production regulations that are specific to water availability, the geographic area and site specific to the well and the wells' behavior in the groundwater environment. Where appropriate and necessary to minimize interference, the District shall cause production monitor wells to be installed along the perimeter of a permittee's property and adjacent to a well field to monitor and regulate the cone of influence within the boundaries of a production unit.

Among the regulatory tools granted to districts, the Legislature empowered districts to protect current users of groundwater, which are those individuals or entities currently invested in or using groundwater resources within the District for a beneficial purpose. The District is also empowered to protect Historic and Existing permit users, which are those individuals or entities that used groundwater beneficially in the past. Most of the groundwater used in Kinney County has been applied to agricultural irrigation, domestic and livestock purposes. The District strives to protect such purposes to the extent practicable under the goals and objectives of this Management Plan. This shall be done without discriminating against any other lawful and beneficial purpose.

Cooperative agreements may be developed and executed between governmental entities pursuant to Texas Governmental Code to accomplish mutual objectives or may be between the District and any well owner to provide a vehicle for gathering site-specific information on well water levels and rainfall histories. These cooperative agreements should facilitate the District providing technical support on the status of the groundwater availability for each well.

The District, through this Management Plan and its rules, will attempt to manage groundwater withdrawals in the District at a level that will not cause depletion of these groundwater management zones in the future. The District should allow as much groundwater to be produced as possible for beneficial purposes while preventing the overproduction and mining of the groundwater resources of Kinney County.

In an effort to protect the springs, intermittent streams and long-term productivity of these groundwater resources, the District shall engage in scientific research and data collection in order to establish the amount of groundwater that can be produced from within the District. Current amounts used are based on TWDB and Region J data. The District's greatest challenge is

determining, through scientific study, the actual groundwater resources of Kinney County. Proper science requires a diligent effort by the District and other interested parties to gather appropriate information and apply that information responsibly. As data becomes available, this Plan and its associated rules should be updated to reflect this additional information. Care should be exercised not to overestimate or underestimate the amount of groundwater available on incomplete, poorly applied science or speculative data.

The District has created a tiered process that categorizes groundwater use and allocates available groundwater in accordance with District rules. The tiered process prioritizes groundwater use for the protection of urban populations within the District, exempt well owners, existing permit users and historic permit users, as the District allocates the remaining available groundwater through the concept of “proportionate reduction” and “zone management processes” as defined in the District’s rules.

The District will protect all permit users by establishing rules for permitting wells, transfer of water permits from one entity or individual to another, and the scientific data requirements for new or increased use. In conversion of permits for export the amount permitted shall not exceed the Maximum Historic Use as demonstrated by the applicant or suggested by agreements with other existing permittees.

As detailed in Section 5.0 of this plan, the General Manager of the District will prepare and submit an annual report ("Annual Report") to the Board of the District. The Annual Report will include an update on the District's performance in regard to achieving management goals and objectives. The General Manager of the District will present the Annual Report within ninety (90) days following the completion of the District's fiscal year audit, beginning with the fiscal year that starts October 1. Upon adoption, the Board will maintain a copy of the Annual Report on file, for public inspection, at the District's offices.

#### **4.11 Actions, Procedures, Performance, and Avoidance**

The District will implement the goals and provisions of this Management Plan and will utilize the objectives of this Management Plan as a guideline in its decision-making to be consistent with the provisions of this plan.

The District has adopted rules, in accordance with Chapter 36 of the Texas Water Code, that implement the Management Plan. The current version of the rules is dated October 13, 2022, and is attached as Appendix G. The rules can be downloaded from the Kinney County Groundwater Conservation District website:

<https://www.kinneycountygcd.org/documents-and-forms.html>

All rules will be followed and enforced. The District will amend the District rules as necessary to comply with changes to Chapter 36 of the Texas Water Code and to ensure the best management of the groundwater within the District. The development and enforcement of the rules of the District will be based on the best scientific and technical evidence available to the District. If, at any point, it appears the District will not be able to achieve the adopted Desired Future Conditions

the Board of Directors will amend the rules as necessary to ensure the Desired Future Conditions will be achieved.

The District will encourage cooperation and coordination in the implementation of this plan. All operations and activities of the District will be performed in a manner that best encourages cooperation with the appropriate state, regional or local water entity. The Board meetings of the District will be noticed and conducted in accordance with the Texas Open Meetings Law. Official documents, reports, records and minutes of the District will be available for public inspection and copying in accordance with the Texas Public Information Act.

Annually, the District will appoint a Groundwater Management Plan Committee, chaired by a Board Director, to conduct a review of (a) science and knowledge of the water resources available for the District's regulation, permitting and conservation and (b) make recommendations for improved management of the resources over which the District has jurisdiction. The Committee's appointment, report and action by the Board in response to such recommendations shall each be noticed in a local publication distributed within Kinney County.

#### **4.12 Evidence that the Plan was Adopted after Notice and Hearing**

The notice for the public hearing was published in the Kinney County Post on December 29, 2022. The public hearing was held at the Kinney County Groundwater Conservation District during the regular Board meeting on January 12, 2023. There were no comments during the public hearing. The Board approved the plan on January 12, 2023 after the close of the public hearing.

Please refer to Appendix H for copies of the notice and agenda for the public hearing.

#### **4.13 Evidence that District Coordinated with Regional Surface Water Management Entities Following Notice and Hearing**

Please refer to Appendix I.

#### **4.14 Site-Specific Information**

Not Applicable

## 5.0 Management Goals

The General Manager of the District will prepare and submit an annual report ("Annual Report") to the Board of the District. The Annual Report will include an update on the District's performance in regard to achieving management goals and objectives. The General Manager of the District will present the Annual Report within ninety (90) days following the completion of the District's fiscal year audit, beginning with the fiscal year that starts October 1. Upon adoption, the Board will maintain a copy of the Annual Report on file, for public inspection, at the District's offices.

### 5.1 Providing the most efficient use of groundwater

#### 5.1.1 Groundwater and Stream Flow Monitoring

**Objective:** Establish a monitoring network to measure groundwater quantity in a minimum of one (1) well per year in the major aquifers of the District and stream flow volume in Las Moras Creek and Pinto Creek.

**Performance Standard:** The District will monitor the water level in at least one well per year in the major aquifers of the District and stream flow volume in Las Moras Creek and Pinto Creek. A report on the data collected through this monitoring network will be included in the Annual Report.

### 5.2 Controlling and preventing waste of groundwater

#### 5.2.1 Elimination of Wasteful Practices Using Groundwater

**Objective:** Increase public awareness within the District regarding the need for water conservation and encourage the elimination of wasteful practices regarding groundwater within the boundaries of the District.

**Performance Standard** – Submit an article annually regarding the elimination of wasteful practices and/or conservation of groundwater to a local publication for distribution in Kinney County and keep a copy in the District office for a period of three (3) years.

### 5.3 Controlling and preventing subsidence

The subsidence tool developed by the Texas Water Development Board was used to assess the potential for subsidence in the two aquifers in the District using the default values provided. The tool can be accessed at:

<http://www.twdb.texas.gov/groundwater/models/research/subsidence/subsidence.asp>

The tool provides a numeric total weighted risk factor that ranges from 0 (low risk) to 10 (high risk). The results of applying the default values from the tool yield the following scores:

- Edwards (BFZ) Aquifer = 2.03
- Edwards-Trinity (Plateau) = 2.97

Based on applying the tool and the geologic setting, this management goal is not applicable to the District due to the low risk of subsidence in Kinney County.

## **5.4 Addressing conjunctive surface water management issues**

### **5.4.1 Regional Planning**

**Objective:** By attending Region J meetings, there is the opportunity to participate in the discussions, planning and education concerning the interrelationship of the groundwater and surface water interface. The Board President or his/her appointed representative will attend 75% of Region J meetings annually.

**Performance Standard:** The minutes for all attended meetings of Region J will be maintained in the District for a period of three (3) years from their accepted date. A report of all attended meetings will be given to the Board at the regular meeting.

## **5.5 Addressing natural resource issues that impact the use and availability of groundwater and which are impacted by the use of groundwater**

### **5.5.1 Joint Planning in GMA 7 and GMA 10**

**Objective:** By attending GMA 7 and GMA 10 meetings, there is the opportunity to participate in discussions, planning and education concerning the interrelationship of groundwater with other natural resource issues. The Board President or his/her appointed representative will attend 75% of the GMA 7 and GMA 10 meetings annually.

**Performance Standard:** The minutes for all attended meetings of GMA 7 and GMA 10 will be maintained in the District for a period of three (3) years from their accepted date. A report of all attended meetings will be given to the Board at the regular meeting.

### **5.5.2 Communication with Governmental Agencies (Edwards Aquifer Authority)**

**Objective:** The District will continue to seek opportunities to work in cooperation with the Edwards Aquifer Authority (EAA) in conducting groundwater studies, including model updates and dye trace studies.

**Performance Standard:** The District will annually maintain a file on the progress or results of the EAA research and any communications received from the EAA about the studies. This documentation will be maintained in the District office. A report on the progress or results of the any studies will be included in the Annual Report and/or provided to the District Board annually.



## **5.6 Addressing drought conditions**

### **5.6.1 Drought Report**

**Objective:** Each month, the District will download available drought information, for the District, from available websites on the internet such as (last accessed on October 6, 2022):

<https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?TX>

**Performance Standard:** The District will assess the status of drought in the District and prepare a briefing for the Board of Directors. The downloaded maps, reports, and information will be included on the regular monthly meeting agenda and retained in the meeting minutes kept at the District office.

## **5.7 Addressing conservation, recharge enhancement, rainwater harvesting, precipitation enhancement, and brush control where appropriate and cost effective**

### **5.7.1 Addressing Conservation**

**Objective** - Increase public awareness within the District regarding the need for water conservation.

**Performance Standard** - Submit an article annually regarding the elimination of wasteful practices and/or conservation of groundwater to a local publication for distribution in Kinney County and a copy kept in the District office for a period of three (3) years.

### **5.7.2 Addressing Recharge Enhancement**

This management goal is not applicable to the District due to lack of available surface water of acceptable quality and cost effectiveness.

### **5.7.3 Addressing Rainwater Harvesting**

**Objective** – The District will post an article or a link to an article annually, regarding rainwater harvesting on the District website.

**Performance Standard** – A copy of the article posted on the District website regarding rainwater harvesting will be included in the Annual Report to the Board of Directors.

### **5.7.4 Addressing Precipitation Enhancement**

This management goal is not applicable to the District because of the generally low annual precipitation, and is considered not cost effective at this time.

### **5.7.5 Addressing Brush Control**

This service is provided by NRCS in Kinney County as a function of the Federal Government. This management goal is not applicable to the District because the objective is not cost effective due to the sparse nature of the vegetation in the District and the fact that much of the recharge to the District's aquifers are outside the boundaries of the District.

## **5.8 Addressing the desired future conditions**

### **5.8.1 GMA 7 – Las Moras Spring**

The desired future condition for Kinney County in GMA 7 is expressed as an average spring flow and a median spring flow for Las Moras Spring based on Scenario 3 of TWDB Draft GAM Task 10-027 (Revised), dated February 9, 2011, which is attached as Appendix A to this plan. Please note that the average flow (23.9 cubic feet per second) and the median flow (24.4 cubic feet per second) were calculated based on a 56-year simulation under a constant pumping assumption. Also, it should be noted that the spring flow in the simulation is based on an end-of-year measurement. Thus, comparison of any individual measured spring flows to this average for purposes of demonstrating consistency with the desired future condition would be inappropriate.

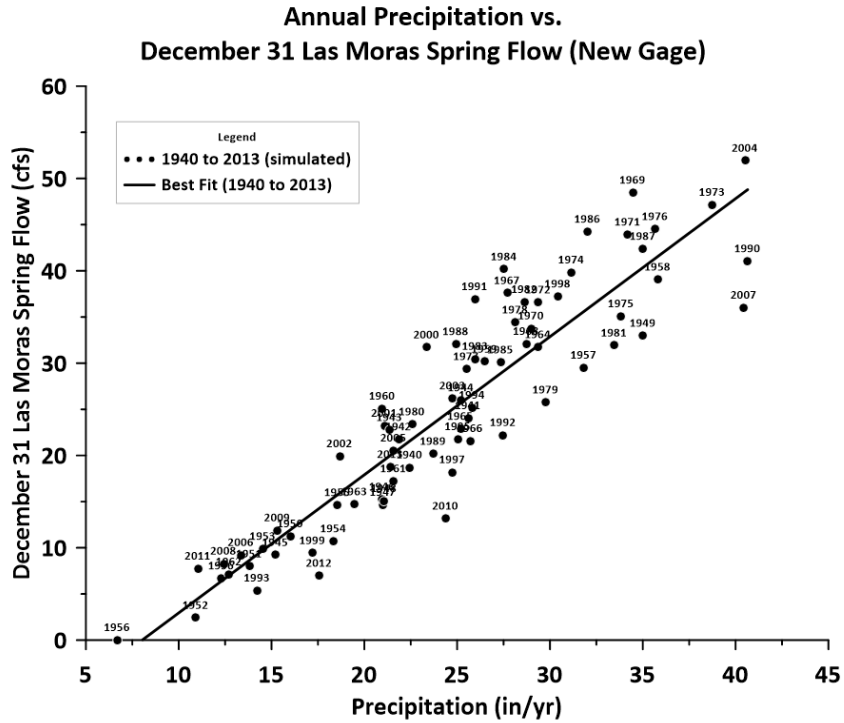
Since the desired future condition is expressed in terms of a spring flow, data from the gage at Las Moras Springs are used to evaluate desired future condition consistency on a year-to-year basis. The analysis that was used in the 2013 and 2018 management plans was based on evaluating data from the old gage. The procedure using data from the new gage has been updated from those management plans. Details of the technical analysis are covered in Appendix A.

The record from the new spring gage location began in October of 2014, so there are only seven years with "end-of-the-year" data. As described in Appendix A, this record was extended with the results of an empirical model of monthly precipitation and end-of-month spring flow. Regional precipitation maintained by TWDB for Quad 807 were used in the analysis.

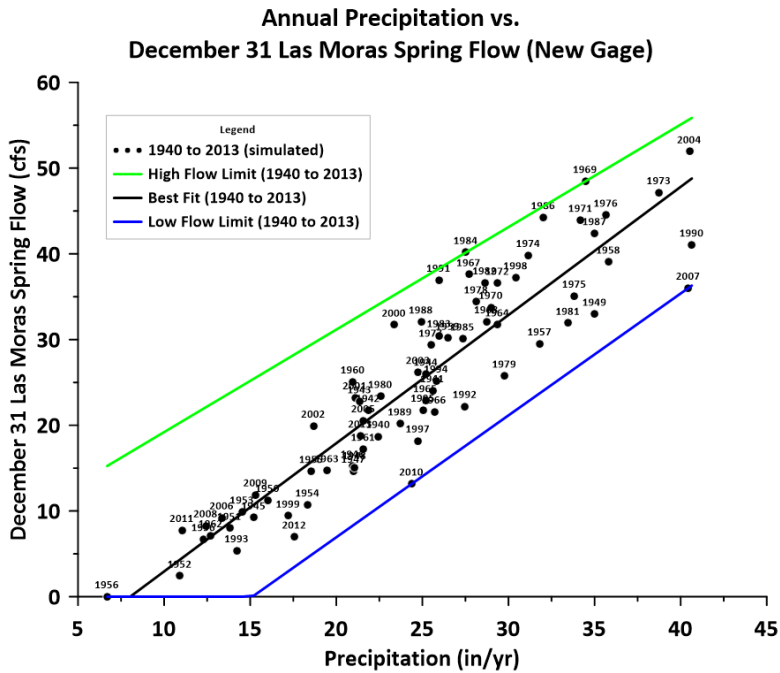
Figure 5 depicts the results of the empirical model (annual precipitation vs. December 31 Las Moras Springs flow from the new gage) for the years 1940 to 2013. Please note that the years are denoted in the figure. A best fit line is included in the figure.

Figure 6 depicts the same data with two bounding lines: one labeled "high flow limit" (based on the years 1969 and 1984), and one labeled "low flow limit" (based on the years 2007 and 2010). These represent the limits of the "historic data" (1940 to 2013).

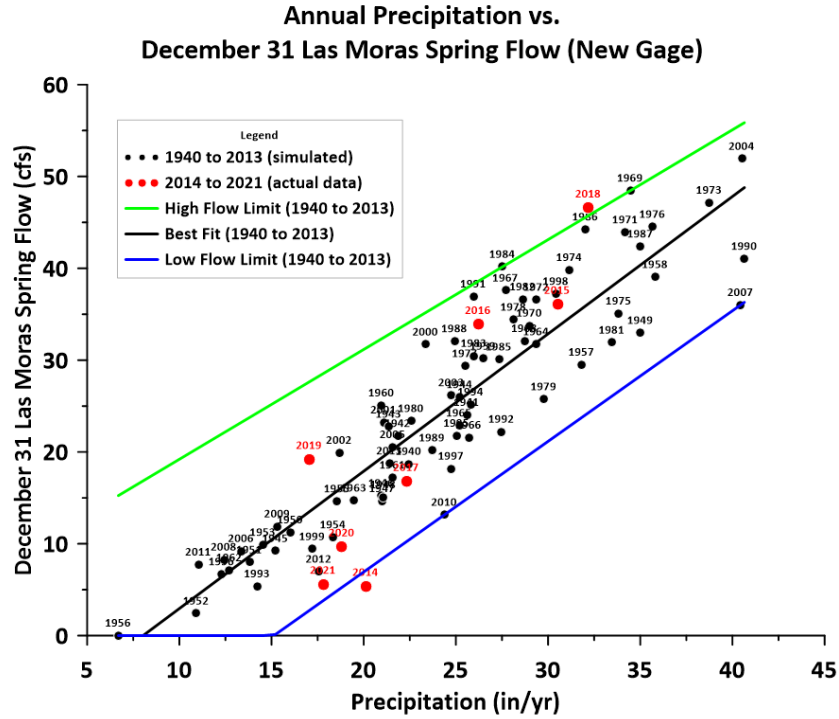
Figure 7 depicts the same data and limits as Figure 6, but the actual data from 2014 to 2021 are now included to evaluate how recent data fit within the bounds of the historic data. Finally, Figure 8 removes the historic data so the actual data from 2014 to 2021 can be seen in the context of the two bounding lines.



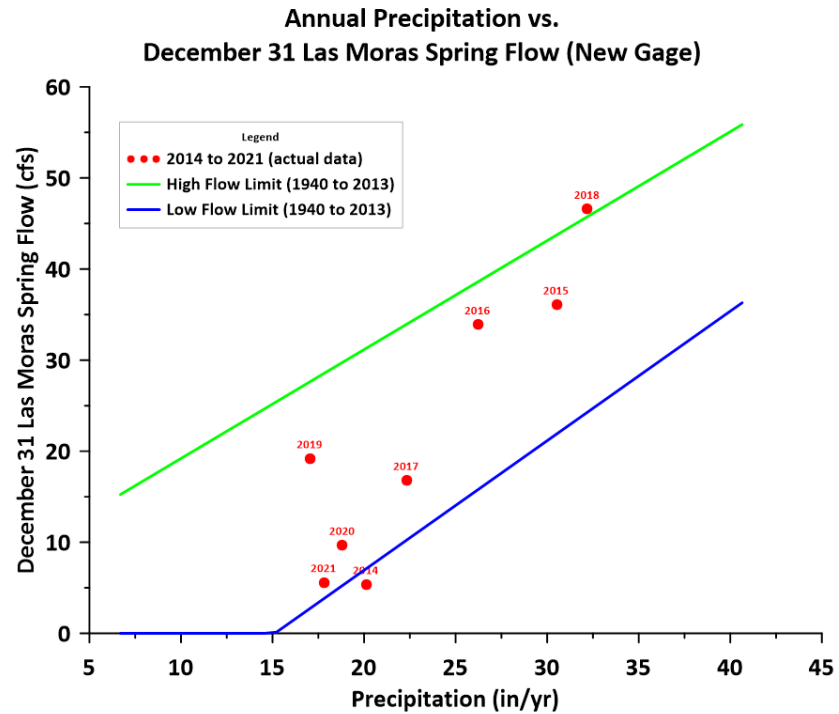
**Figure 5. Precipitation vs. Spring Flow: Empirical Model Results (1940 to 2013)**



**Figure 6. Precipitation vs. Spring Flow: Empirical Model Results with Bounding Limits (1940 to 2013)**



**Figure 7. Precipitation vs. Spring Flow: Empirical Model Results, Bounding Limits and Actual Data from 2014 to 2021**



**Figure 8. Precipitation vs. Spring Flow: Bounding Limits and Actual Data from 2014 to 2021**

Please note that the results from 2014 plot below the “low flow limit” line and the results from 2018 plot above the “high flow limit” line. Average precipitation from 1940 to 2021 was 24.39 in/yr in Quad 807. The precipitation in 2013 was slightly below average (21.4 in), but the precipitation in 2011 and 2012 was significantly below average (11.04 and 17.57 in, respectively). This suggests that the effects of the long-term dry conditions impacted the 2014 spring flow relative to the annual precipitation, which was below average (20.44 in). The fact that the 2015 and 2016 points are well within the bounds of the “low flow limit” and “high flow limit” during years with higher-than-average precipitation (30.51 and 26.21 in, respectively) suggest that the recovery in groundwater levels associated with high precipitation years essentially “reset” the groundwater system. This suggests that, in the future, some additional analysis is required if a point drops below the “low flow limit” line.

Similarly, the results from 2018 plot above the “high flow limit” line. Precipitation in 2018 was 32.18 in, and precipitation in the two of the preceding three years were also above average (30.51 inches in 2015, 26.21 inches in 2016, and 22.32 inches in 2017). This suggests that effects of long-term wet conditions impacted 2018 spring flow relative to the annual precipitation.

**Objective** – The District will assess annually the end-of-year Las Moras spring flow and annual precipitation to evaluate consistency with the desired future condition.

**Performance Standard** – Each year, data on annual precipitation from Quad 807 (obtained from TWDB) and end-of-year Las Moras spring flow will be collected. The results will be reported as an agenda item at the first Board meeting after the annual precipitation data are available from TWDB, and final (not provisional) Las Moras Springs flow data are available from the USGS.

Precipitation data from TWDB are obtained at:

<https://waterdatafortexas.org/lake-evaporation-rainfall>

Las Moras Springs flow data from the USGS are available at:

<https://waterdata.usgs.gov/monitoring-location/08456310/#parameterCode=00065&period=P7D>

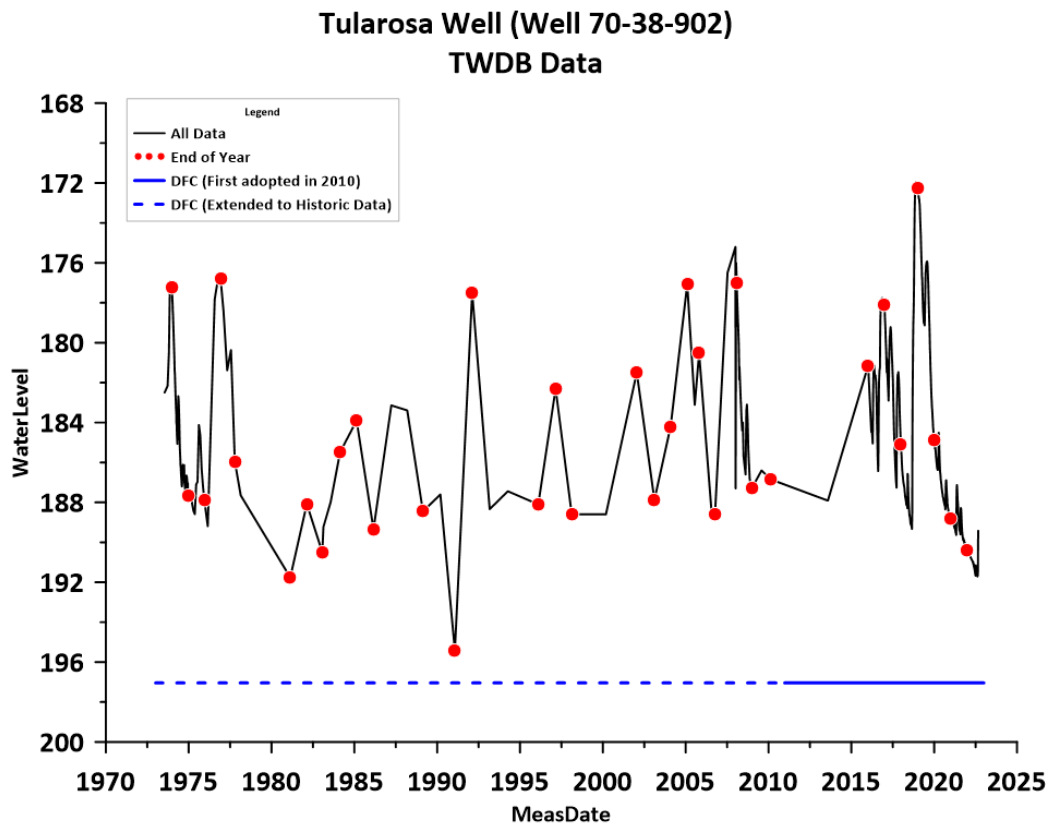
### 5.8.2 GMA 10 – Well 70-38-902

The desired future condition in the GMA 10 portion of Kinney County is that the groundwater elevation in Well 70-38-902 (also known as the Tularosa Well) shall not fall below 1,184 feet mean sea level. Because this condition was based on a model run that considered end-of-year groundwater elevations, data collected at the end of the year would be used for comparison purposes.

There is a discrepancy in reported measuring point elevation. TWDB reports a measuring point elevation of 1381.042 ft MSL and 1382 ft MSL in different locations. This means the desired future condition expressed as a depth to water in the well is either 197.042 ft or 198 ft. TWDB

installed an automatic recorder in the well on March 14, 2016, which facilitates the analysis of groundwater level fluctuations in this well.

All the monitoring data from this well are summarized in a hydrograph (Figure 9). The full record of depth-to-water data are shown as a black line, and the end-of-year data that would be used for this comparison is shown as red points. Please note that the depth to water data are presented along with the desired future condition (solid line after the date of adoption and dashed line before the date of adoption).



Please note that the desired future condition was based on a model simulation. The recent inclusion of this well in the automated recorder program has provided more detailed data than were available at the time of model development (2010) and at the time of the establishment of the original desired future condition (also in 2010). It appears that the desired future condition is lower than the historic minimum of the well (recorded in the early 1990s) and is significantly lower than recent times. Consequently, it appears that the desired future condition for the GMA 10 portion of Kinney County be reevaluated and changed to a higher depth to water. Additional analyses and studies are ongoing to provide technical recommendations to the Board prior to the deadline for the next proposed desired future conditions (May 1, 2026).

**Objective** - The District use the groundwater elevation measured in Well 70-38-902 by the Texas Water Development Board to check consistency with the desired future condition. This well is currently one of the automated recorder wells and the data are available online at:

<https://waterdatafortexas.org/groundwater/well/7038902>

**Performance Standard** – The measured groundwater elevation in Well 70-38-902 taken at the end of the year and the desired future condition minimum elevation will be reported to the Board at the first meeting of the calendar year when the data are made available by TWDB.