



**Barton Springs
Edwards Aquifer**
CONSERVATION DISTRICT

Habitat Conservation Plan and Incidental Take Permit

Annual Report - FY 2022

(9/1/2021 - 8/31/2022)

February 24, 2023

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Permit # TE 10607- 0

Endangered Species Act Section 10(a)(1)(B) Permit for the Incidental Take of the Barton Springs Salamander (*Eurycea sosorum*) and Austin Blind Salamander (*Eurycea waterlooensis*) for Managed Groundwater Withdrawals from the Barton Springs Segment of the Edwards Aquifer

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1.0 Introduction and Background

The Barton Springs/Edwards Aquifer Conservation District's ("District") Habitat Conservation Plan (HCP) and Incidental Take Permit (ITP) require the District to report annually on the status of the District's program implementation and achievement of conservation measures and objectives. This document is the Annual Report for Fiscal Year 2022, covering the period September 1, 2021 – August 31, 2022 (reporting period).

According to the Incidental Take Permit, the Annual Report shall cover:

1. Descriptions of Covered Activities undertaken;
2. Reported groundwater withdrawals from permitted wells;
3. Reference well levels;
4. Springflow at Barton Springs;
5. Total Aquifer discharge, measured for permitted wells, estimated for exempt wells, gaged/measured for Barton Springs, and estimated for Cold and Deep Eddy Springs;
6. Drought-stage management reductions;
7. Estimated actual take, if any, for the annual reporting period, and total cumulative take for the ITP term;
8. Minimization measures and actions taken during the prior year;
9. Mitigation actions taken during the year and updates on any ongoing mitigation actions;
10. An evaluation of the effectiveness of the avoidance, minimization, and conservation measures;
11. Adaptive management activities undertaken during the year or indicated as prudent by outcomes of the conservation program;
12. Expenditures by the District on implementation activities;
13. Any species-specific or aquifer research compiled or completed during the prior year;
14. Proposed activities for the next year;
15. Recommendations for improvement; and
16. Any other appropriate information documenting Permittee's compliance with the Permit.

This introduction section provides an overview of the District's application of the authority provided to manage the groundwater resources within the District and the fundamental management concepts and strategies that embody the District's regulatory and permitting program. Included as part of the introduction is a background and an overview of the following:

- 1.1 General Information about the District
- 1.2 Management of Groundwater Resources in the District
- 1.3 Implementation of Management Plan (MP) and HCP
- 1.4 Background on District's Incidental ITP

Other major report sections that follow include a summary of the District's minimization measures and mitigation actions taken during the reporting year, a review of drought management activities, aquifer status, and an outlook for planned activities.

Additionally, included as Appendix D of this annual report, is a summary of the meeting discussion and comments received from the HCP Management Advisory Committee (MAC). The District established an HCP MAC to advise and assist the Board in coordination of conservation activities affecting Covered Species at Barton Springs, and in monitoring and helping the Board improve implementation of the District HCP. The MAC provides an additional measure to ensure continued improvement of the HCP and compliance with the ITP, and ensures the Board is aware of stakeholder concerns regarding execution of and revisions to the HCP. The primary purpose of the MAC is to review and comment on the District's HCP annual reports, or on selected aspects of those reports, in its role to provide continuing improvement recommendations. At the Board's discretion, the MAC may also be requested to:

- Provide a forum for exchange of information relative to Covered Species,
- Provide ad hoc advice on Covered Species management activities,
- Advise the District on priorities for conservation actions, as warranted, and
- Provide input and recommendations, as warranted, on the development and implementation of actions through the adaptive management program.

The MAC was appointed by the District Board in early 2013 and includes independent, volunteer representatives with biological or natural-resource management responsibilities from designated interest groups. MAC composition focused on perspectives useful to the active management of the Aquifer and habitat of Covered Species at Barton Springs. The U.S. Fish and Wildlife Service (Service) was also requested to provide a nonvoting representative to be liaison between the District, the Service, and the MAC. The MAC will convene in some manner appropriate to the purpose of each meeting and no less frequently than annually, and at such other times as they decide or as requested by the Board.

1.1 General Information about the District

1.1.1 Background.

Since 1904, the legal framework applied to groundwater resources in Texas has been the common law "Rule of Capture." Although the Rule of Capture remains in effect today, groundwater conservation districts (GCDs), such as the District, have been established across the state and authorized to modify how the Rule of Capture shall be applied within their boundaries as part of a comprehensive, approved groundwater management plan.

In 1997, the Texas Legislature codified the commitment to GCDs in Chapter 36, Section 36.0015 of the Texas Water Code (TWC) by designating GCDs as the preferred method of groundwater management. This section of Chapter 36 also establishes that GCDs will manage groundwater resources in order to protect property rights, balance the conservation and development of groundwater to meet the needs of this state, and use

the best available science through rules developed, adopted, and promulgated in accordance with Chapter 36. As the overarching statute governing GCDs, Chapter 36 gives specific directives to GCDs and the statutory authority to carry out such directives. It provides the so-called “toolbox” that enables GCDs to promulgate appropriate rules needed to protect and manage groundwater resources within their boundaries given consideration to conditions and factors unique to each GCD.

In addition to Chapter 36 authority, the District has powers expressly granted by Chapter 8802 of the Special District Local Laws Code (“the District Enabling Legislation”). Applied together, these statutes provide the District with the authority to serve the statutory purpose to provide for the conservation, preservation, protection, recharging, and prevention of waste of groundwater, and of groundwater reservoirs or their subdivisions, and to control subsidence caused by withdrawal of water from those groundwater reservoirs or their subdivisions.

1.1.2 Authority and Purpose

The District was created in 1987 by the 70th Texas Legislature, under Senate Bill 988. Its statutory authorities include Chapter 52 (later revised to TWC, Chapter 36), applicable to all GCDs in the state, and the District’s enabling legislation, now codified as Chapter 8802, Special District Local Laws Code. The District’s legislative mandate is to conserve, protect, and enhance the groundwater resources located within the District boundaries. The District has the power and authority to undertake various studies, assess fees on groundwater pumpage and transport, and to implement structural facilities and non-structural programs to achieve its statutory mandate. The District has rulemaking authority to implement its policies and procedures and to help ensure management of groundwater resources as directed by the Board. The District is not a taxing authority. Its only sources of income are groundwater production fees, the annual City of Austin water use fee, export fees, administrative fees, and occasional grants from various local, state, and federal programs for special projects.

1.1.3 Jurisdictional Area

Upon creation in 1987, the District’s jurisdictional area encompassed approximately 255 square miles including parts of four counties: northwestern Caldwell, northeastern Hays, southeastern Travis Counties, and a small territory in western Bastrop County. In 2011, that small part of Bastrop County was de-annexed from the District and is now in Lost Pines GCD’s sole jurisdiction. The jurisdictional area was generally defined to include all the area within the Barton Springs segment of the Edwards Aquifer with an extended area to the east to incorporate the service areas of the Creedmoor-Maha Water Supply Corporation, Goforth Special Utility District, and Monarch Utilities. In this area, designated as the “Exclusive Territory,” the District has authority over all groundwater resources.

In 2015, the 84th Texas Legislature (House Bill 3405) expanded the District’s jurisdictional area to include the portion of Hays County located within the boundaries of the Edwards Aquifer Authority (EAA) excluding the overlapping area in the Plum Creek Conservation District as show in Figure 1. The newly annexed area, designated as “Shared Territory,” excludes the Edwards Aquifer and includes all other aquifers, including the underlying

Trinity Aquifer. The District's jurisdictional area including the Shared Territory encompasses approximately 420 square miles and includes both urban and rural areas. The District shares boundaries with adjacent GCDs to the west, south, and east including the Hays Trinity GCD, Comal Trinity GCD, EAA, Plum Creek GCD, and Lost Pines GCD, respectively. The District participates in joint-regional planning with these and other GCDs in Groundwater Management Areas (GMAs) 9 and 10 which are configured generally to encompass the Trinity and Edwards Aquifers, respectively.

1.1.4 Aquifers and Uses

Water from the Barton Springs segment of the Edwards Aquifer serves as the primary water source for public water supply, industrial, and commercial purposes for some parts of the District, and is a source of high-quality base flow to the Colorado River via discharge through the Barton Springs complex. The Barton Springs complex provides habitat for the Barton Springs salamander (*Eurycea sosorum*) and Austin blind salamander (*Eurycea waterlooensis*) which are both federally listed Endangered Species under the Endangered Species Act requiring all activities that would or could adversely affect the species to represent optimal conservation efforts. The Trinity Aquifer underlying the Edwards, is an important primary water resource in some parts of the District and is increasingly being developed in both the Exclusive and Shared Territory. Some wells in the District also produce water from the Taylor and Austin Chalk formations as well as various alluvial deposits along river and stream banks.

The area has a long history of farming, ranching, and rural domestic use of groundwater, but over time the region has become more urban in areas of south Austin, Buda, Kyle, and San Marcos. Groundwater use in the area is now primarily for domestic and public water-supply purposes, with lesser amounts utilized for commercial, irrigation, and industrial use. See Figure 2 for a general breakdown of water-use types in the District, and percentage of permitted production for each classification category.

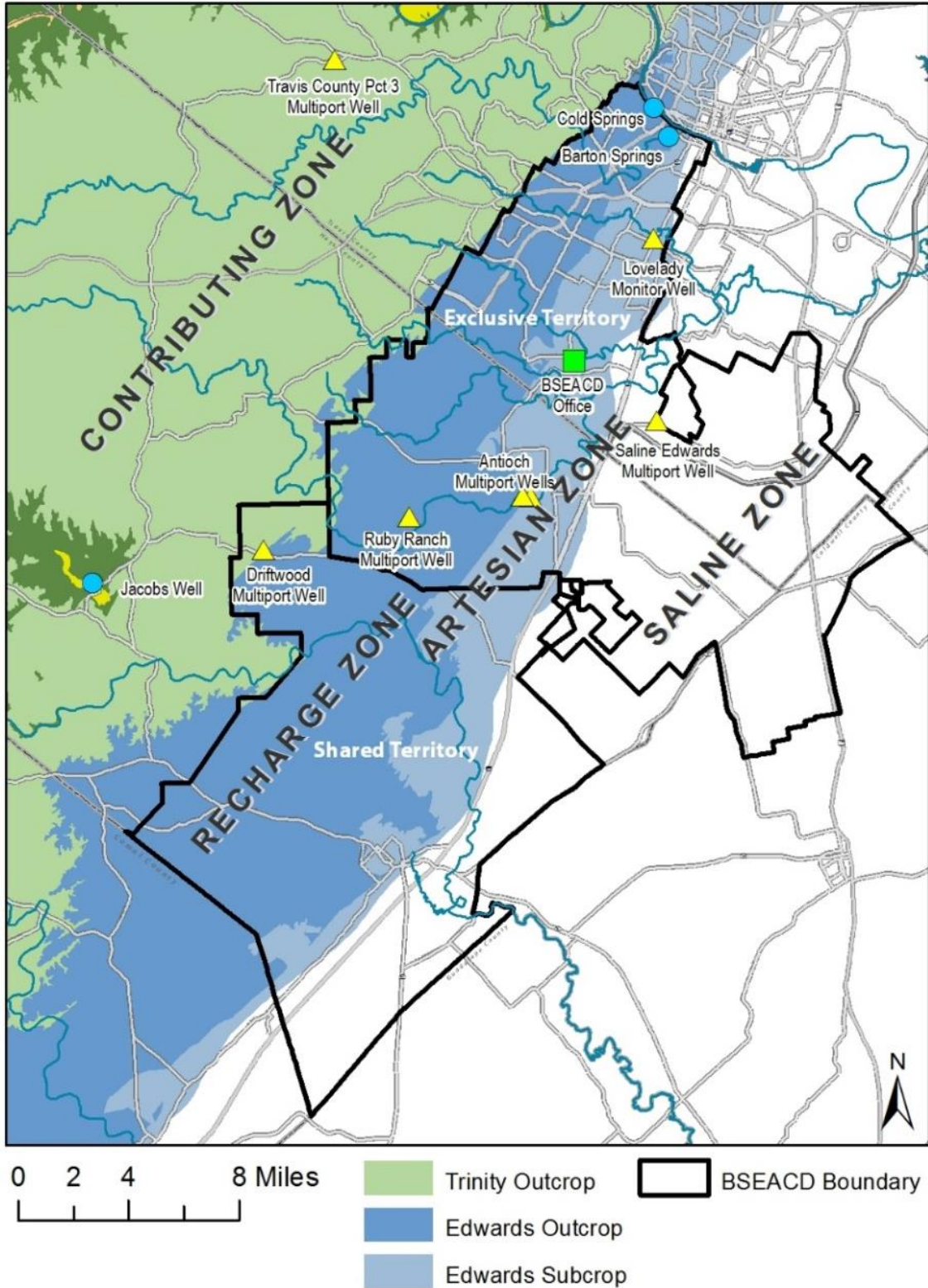


Figure 1. Location of the Barton Springs/Edwards Aquifer Conservation District

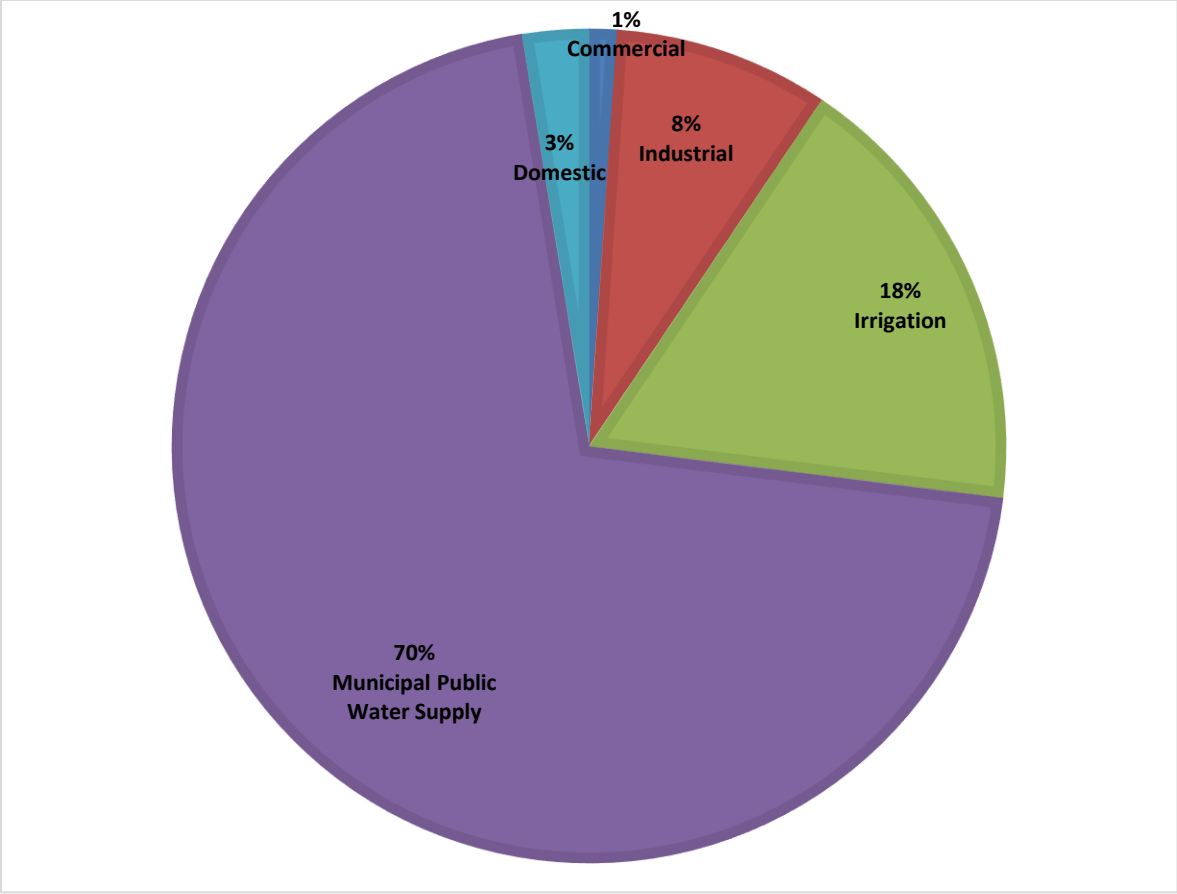


Figure 2. Types of Groundwater Use and Their Percent of Authorized Use for Permitted Wells in the District

1.2 Management of Groundwater Resources in the District

Since its creation in 1987, the District has honored the established precedent of developing policy and management strategies on the basis of statutory compliance, sound science, and stakeholder input. The District established a precedent for developing the governing policies and rules through an initial data-driven evaluation of the science to characterize the District's aquifers followed by a thorough vetting by affected stakeholders and the public. This process has served to inform the Board's direction and policy decisions resulting in the current regulatory program that has evolved to address challenges unique to the District. This evolution has been marked by key milestones, producing management strategies that are now integrated within the current regulatory approach. The evolution of the District's policies and strategies has produced a regulatory program that is fair, innovative, and customized to objectively address challenges and management objectives unique to the District. The District's management approach evolved from an initial focus on permitting for historical use from 1987 until the completion of the sustainable yield study in 2004. On the basis of that study, the District began preparation for management under an HCP to protect the endangered salamanders at Barton Springs.

After the passage of HB 3405 in 2015, the District's attention broadened to include management of the Trinity Aquifer and other non-Edwards aquifers in the Shared Territory, development of a permitting program with a refined interest in managing to avoid unreasonable impacts, and an updated definition of sustainable yield. The integration of these strategies collectively produced a program formed on the basis of demand-based permitting coupled with an evaluation of the potential for localized and regional unreasonable impacts. This permitting approach is bolstered by an active drought management program to abate groundwater depletion during District-declared drought. The current permitting and drought management programs are further described below.

Permitting. The current permitting program in place and supported by the District's MP applies a three-part evaluation to affirm beneficial use in accordance with demand-based permitting standards, and to evaluate the full range of potential impacts for each production permit request. The three-part permit evaluation involves an assessment of reasonable nonspeculative demand, local scale evaluations, and aquifer scale evaluations. The extent of the evaluation scales with the magnitude of the requested production volume, and the more comprehensive evaluations are reserved for more complex, larger-scale projects that show greater potential to cause unreasonable impacts. More information on the District's permitting program can be found on the District's website here: <https://bseacd.org/regulatory/permit-process/>

Drought Management. One of the principal responsibilities central to the District's mission is to manage groundwater production during drought conditions when the aquifers are most stressed. After creation of the District in 1987 and until 2004, the District put into place its initial permitting program and drought management program with a network of drought indicator wells and curtailments linked to percentiles of monthly flow at Barton

Springs. With a burgeoning regional population and increasing demand on District aquifers coupled with the findings of the sustainable yield study, the District recognized a need to improve the drought management program. Significant droughts in 2006, 2008–09, and 2011 provided further impetus for a series of amendments to implement more effective science-based drought trigger methodology and expand permit-based drought rules and enforcement protocol. The amendments produced milestones in the District's regulatory approach (e.g., conditional permitting, Extreme Drought Withdrawal Limits, the Ecological Flow Reserve, and Management Zones) that were the product of numerous scientific studies conducted by the District's hydrogeologists, vetted through technical consultants and advisors, reviewed and commented on by stakeholders and the public, and approved by the Board.

The current drought management program in place and supported by the District's MP is implemented through User Drought Contingency Plans (UDCPs) that are an integral component required of each production permit. Drought declarations involve continuous evaluation of aquifer conditions measured at the drought indicators for the Edwards Aquifer that also serve as surrogates indicative of regional drought conditions for all District aquifers. When designated aquifer conditions are met, permittees are required to implement prescribed measures of the UDCPs requiring mandatory curtailments of permitted groundwater production based on permit type (Table 1) and aquifer management zones.

The various types of wells are defined below:

Conditional Production Permit - an authorization issued by the District allowing the withdrawal of a specific amount of Edwards groundwater from a nonexempt well for a designated period of time, generally in the form of a specific number of gallons per District fiscal year, which is subject to complete cessation, temporary curtailment, or reduction of the amount of groundwater that may be withdrawn during District-declared drought stages. Conditional Production Permits are classified as Class A, Class B, Class C, or Class D.

Exempt Well - a well whose use and characteristics do not require a permit for the production of groundwater within the District.

Historical Production Permit - an authorization with Historic Use Status issued by the District for a designated period of time allowing the withdrawal of a specific amount of groundwater from a nonexempt well.

Limited Production Permit (LPP) - a permit issued for nonexempt groundwater use associated primarily with domestic or livestock uses authorized under District (a nonexempt well).

Nonexempt Well - a well required to obtain a well drilling authorization for well drilling or modification and a permit for the production of groundwater from within the District.

Table 1. Fresh Edwards Permit Types

Permit Type	Use Type	Description
[IPP] NE- Class A Conditional Fresh Edwards	Various Uses: Commercial, Institutional, Industrial, Agricultural, Irrigation, Public Water Supply	This permit applies to the Eastern and Western Fresh Edwards Management zones and is for those registered nonexempt wells approved by the District prior to September 2004. These permits are subject to drought restrictions. These permits have a max curtailment of up to 50%.
[IPP] NE- Class B Conditional Fresh Edwards	Various Uses: Commercial, Institutional, Industrial, Agricultural, Irrigation, Public Water Supply	This permit type applies to the Eastern and Western Fresh Edwards Management zones and is for those registered nonexempt wells approved after April 2007. Wells that have been issued this permit are interruptible and are subject to drought restrictions of up to 100% curtailment during a Stage IV Exceptional Drought.
[IPP] NE- Class C Conditional Fresh Edwards	Various Uses: Commercial, Institutional, Industrial, Agricultural, Irrigation, Public Water Supply, Domestic	This permit type applies to the Eastern and Western Fresh Edwards Management zones and is for those registered nonexempt wells approved after March 2011. Wells that have been issued this permit are interruptible and are subject to drought restrictions of up to 100% curtailment during a Stage IV Exceptional Drought.
[IPP] NE- Class D Conditional Fresh Edwards	Aquifer Storage and Recovery (ASR)	This permit applies to groundwater productions associated with Aquifer Storage and Recovery projects where stored water is recovered and used to supplement or substitute Freshwater Edwards supplies during District Declared Drought.
[IPP] NE – Historical Fresh Edwards	Various Uses: Commercial, Institutional, Industrial, Agricultural, Irrigation, Public Water Supply, Domestic	This permit applies to the Eastern and Western Fresh Edwards Management zones and is for those registered nonexempt wells approved by the District prior to September 2004. This permit type is no longer issued for new nonexempt wells. These permits are subject to drought restrictions of up to 50% curtailment during a Stage IV Exceptional Drought

Note: An IPP is an Individual Production permit.

Curtailments are implemented on a monthly basis during District-declared drought and increase with drought severity with maximum curtailments reserved for an Emergency Response Period as shown in Table 2. Curtailments are derived on the basis of a pumping profile representing the average monthly distribution of the demand-based annual permit volume for each groundwater use type and are calculated as a percentage reduction off of the monthly baseline amount as shown in the example drought target chart in Figure 3. Authorized permit volumes based on reasonable nonspeculative demand, monthly reporting of actual groundwater production by permittees, and active enforcement of monthly curtailments are integral to effective drought management to ensure the more immediate and consistent relief in actual pumping pressure needed to sustain spring flows and existing water supplies during District-declared drought until the drought conditions recede and the aquifers recover.

Table 2. Mandatory Drought Curtailments by Permit

Curtailments established for different well permit types, aquifers, and drought conditions. (Curtailment expressed as percentage of authorized monthly groundwater production in designated drought stage. For example, freshwater Edwards Aquifer historical permittees would be required to curtail their authorized monthly withdrawal by 30% during Stage III Critical Drought.)

Drought Curtailment Chart											
Aquifer Management Zone Permit Type		Edwards Aquifer					Trinity Aquifer				
		Eastern/Western Freshwater					Saline	Lower	Middle	Upper	Outcrop
		Historical	Conditional				Hist.	Hist.	Hist.	Hist.	Hist.
			Class A	Class B	Class C	Class D					
Drought Stages	No Drought	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Water Conservation (Voluntary)	10%	10%	10%	10%	10%	0%	10%	10%	10%	10%
	Stage II Alarm	20%	20%	50%	100%	100%	0%	20%	20%	20%	20%
	Stage III Critical	30%	30%	75%	100%	100%	0%	30%	30%	30%	30%
	Stage IV Exceptional	40%	50% ¹	100%	100%	100%	0%	30%	30%	30%	30%
	Emergency Response Period	50% ³	>50% ²	100%	100%	100%	0%	30%	30%	30%	30%

Percentages indicate the curtailed volumes required during specific stages of drought.

- 1 Only applicable to Limited Production Permits (LPPs) and existing unpermitted nonexempt wells after A to B reclassification triggered by Exceptional Stage declaration.
- 2 Curtailment > 50% subject to Board discretion.
- 3 Emergency Response Period (ERP) (50%) curtailments become effective October 11, 2015. ERP curtailments to be measured as rolling 90-day average after first three months of declared ER.

Drought Target Chart							
Historic Edwards Production Permit -		Permittee					
Water Use:	Public Water Supply					UDCP Approved in Fiscal Year:	FY 2020
Permitted Pumpage (GPY):	20,000,000						
Fresh Edwards Management Zone							
Pumpage Volume Targets During Drought Stages							
Fiscal Year	Monthly Volume Allocation	No Drought Baseline	Stage I Water Con. Period (Voluntary)	Stage II Alarm (Mandatory)	Stage III Critical (Mandatory)	Stage IV Exceptional (Mandatory)	Emergency* Response Period (Mandatory)
		No Reduction	10% Reduction	20% Reduction	30% Reduction	40% Reduction	50% Reduction*
September	10.00%	2,000,000	1,800,000	1,600,000	1,400,000	1,200,000	1,000,000
October	8.30%	1,660,000	1,494,000	1,328,000	1,162,000	996,000	830,000
November	7.00%	1,400,000	1,260,000	1,120,000	980,000	840,000	700,000
December	6.30%	1,260,000	1,134,000	1,008,000	882,000	756,000	630,000
January	6.30%	1,260,000	1,134,000	1,008,000	882,000	756,000	630,000
February	6.50%	1,300,000	1,170,000	1,040,000	910,000	780,000	650,000
March	6.60%	1,320,000	1,188,000	1,056,000	924,000	792,000	660,000
April	7.40%	1,480,000	1,332,000	1,184,000	1,036,000	888,000	740,000
May	8.00%	1,600,000	1,440,000	1,280,000	1,120,000	960,000	800,000
June	9.50%	1,900,000	1,710,000	1,520,000	1,330,000	1,140,000	950,000
July	12.10%	2,420,000	2,178,000	1,936,000	1,694,000	1,452,000	1,210,000
August	12.00%	2,400,000	2,160,000	1,920,000	1,680,000	1,440,000	1,200,000
Annual Totals:	100.00%	20,000,000	18,000,000	16,000,000	14,000,000	12,000,000	10,000,000

* ERP(50%) ERP curtailments to be measured as a rolling 90 day average after the first three months of declared ERP.

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District Representative	Date
Permittee Signature	Date

Figure 3. Example Permittee Drought Target Chart

1.3 Implementation of Management Plan and Habitat Conservation Plan

The provisions of the District’s MP and HCP will be implemented and used by the District as a guide for determining the direction or priority for all District activities. All operations of the District, all agreements entered into by the District, all District policies and programs, and any additional planning efforts in which the District may participate will be consistent with the provisions of the District’s MP and HCP. The District will encourage cooperation and coordination with relevant entities to implement these plans.

The District adopted and implemented rules necessary to support its mission including rules related to permitting of wells, production and transport of groundwater, and drought management. Rules and policies established by the District are consistent with the provisions of these plans and are adopted on the basis of the best available science, public and stakeholder input, and recommendations of competent professionals. Further, the rules comply with TWC Chapter 36 and the District’s enabling legislation. All rules are enforced in a manner that is fair and objective. A copy of the Rules can be found on the District’s website here: <http://bseacd.org/about-us/governing-documents/>.

In order to achieve the goals, management objectives, and performance standards adopted in these plans, the District continually works to develop, maintain, review, and update rules, policies, and procedures for the various programs and activities described

within the MP and HCP. As a means to monitor performance, the District implements various goals, management objectives, and performance standards adopted in these plans. On an annual basis, the District develops annual reports for the MP and HCP that document progress made towards implementation and achievement of the goals and objectives.

All specific activities undertaken by the District in this FY 2022 reporting period, whether considered as direct or indirect management of the Aquifer are described in more detail in the latest “FY 2022 Management Plan Annual Report,” which can be viewed and downloaded at: <https://bseacd.org/uploads/Annual-Report-with-Appendix-A-and-B.pdf>

1.4 Background on District’s Incidental Take Permit (ITP)

The District is charged with the management of the Barton Springs segment of the Edwards Aquifer (“Aquifer”), which is the primary water supply for more than 60,000 people in the region and the source water for the Barton Springs complex. The District manages this resource by a production permit-based regulatory program for larger, non-exempt wells, and these regulatory program elements constitute the Covered Activities described in the HCP. The overarching strategic purpose of the District is to optimize sustainable uses of groundwater for these users and other community interests.

However, it is established that during drought conditions large amounts of groundwater withdrawals (pumping) will contribute to diminished flow through the Aquifer, smaller springflow rates at Barton Springs, and associated adverse effects to some Aquifer users. The 2004 Sustainable Yield of the Barton Springs Segment report can be viewed at https://bseacd.org/uploads/HR_SustYield_BSEACD_report_2004_web.pdf. The Aquifer and its associated spring outlets are the sole habitat of the federally-protected Barton Springs salamander (BSS) and Austin blind salamander (ABS). The federal Endangered Species Act prohibits the harassment or harm of the salamanders (termed “take”) that may incidentally occur as a result of the effect of pumping on decreasing water levels and springflows unless exempted under a federal ITP.

The District’s activities that create the need for an HCP and an ITP relate to the District’s following grammatic functions for managing groundwater production:

- Adopt, implement, and enforce regulations and management programs that protect existing groundwater supplies, improve aquifer demand management, provide Aquifer and springflow protection during droughts, promote and improve aquifer recharge, and carry out other beneficial management strategies; and
- Avoid, or minimize, and mitigate negative impacts upon federally listed species dependent upon springflow from Barton Springs through adoption and implementation of regulations, management programs, scientific research programs, conservation education programs, and collaborative efforts with other governmental entities.

These activities directly and indirectly affect withdrawals (groundwater production) from the Aquifer. In turn, as a result of the hydrology of the groundwater system, such withdrawals lower the water levels in the Aquifer, which consequently reduces the discharge (springflow or flow) at Barton Springs. There is a well-established relationship, within the observed data range between the flow issuing from the outlets of Barton Springs and the chemistry of the water. As flow decreases, the dissolved oxygen (DO) concentration of the water, which is required by the Covered Species for survival, decreases, and the concentration of dissolved solids increases. This natural variation in water chemistry derives from the physical system of the Aquifer, and it occurs regardless of whether Aquifer water-levels and springflow decreases are due to drought, withdrawals by wells, or both.

During normal and high-flow conditions in the Aquifer, the combined flow of the natural outlets at Barton Springs are minimally affected by the total amount of water that is being withdrawn by wells in the Aquifer. Under these conditions, the District's program elements principally address the long-term sustainability of the Aquifer as a water supply. Under these high-flow conditions, the amount of water withdrawn from the Aquifer by pumping wells and the provisions of the District's regulatory program are believed to have essentially no effect on the chemistry of the springflow. This is because the physical and chemical characteristics of the springflow are mostly attributable to meteorologically-induced stormflows and seasonal factors, and from time to time, other external factors.

Accordingly, essentially no incidental take is attributable to the Covered Activities (lawfully conducted withdrawals from District permitted wells, see HCP Section 4.1, Proposed Covered Activities) when water levels in the Aquifer are above a certain elevation, which determines the flow at the Aquifer's major outlet, Barton Springs.

But during drought, and especially prolonged severe or Extreme Drought, the amount of water naturally discharging from the springs complex (the natural spring outlets taken together) is much smaller, similar in magnitude to the amount of water withdrawn from wells. During these drought conditions, the District's groundwater drought management program is key to preserving groundwater levels in the Aquifer and springflow. The joint and regional water planning conducted by the State, with which the District's MP is integrated, uses a recurrence of the drought of record (DOR) in the 1950s as the planning objective, and the DOR is also the framework for the District's drought management program. The District's integrated regulatory program is designed to protect the water supply of Aquifer users who are most vulnerable to supply interruption during periods of Extreme Drought and to conserve flows at Barton Springs for both ecological and recreational purposes.

During drought periods with low recharge rates, groundwater pumping contributes to diminished rates of springflow at Barton Springs. It is during these drought periods that groundwater levels and springflows decline sufficiently to create conditions in which District-managed activities may create incidental take and the programmatic need for the HCP and the ITP. Circumstances that give rise to such incidental take are discussed in

detail in HCP Section 5.2.2, Spatial and Temporal Extent of Take, and HCP Section 5.2.3, Consideration of Take and Jeopardy.

The cumulative withdrawals of all operating wells in the Aquifer can have significant impact on springflow during drought conditions and can increase the likelihood of low-flow conditions. Since June 2008, despite increased demand for water supplies in the District, withdrawals generally have been reduced as a result of groundwater management policies and regulations of the District and of responses by its permittees to projected shortfalls during severe droughts. As demand for groundwater has increased, the District has gradually changed its drought management and regulatory program to improve the effectiveness of Aquifer and springflow protection, supported by studies and planning for the ongoing HCP development.

The HCP specifies the District's commitment to a set of conservation (avoidance, minimization, and mitigation) measures consistent with statutory authorities of the District and that are based on sound science and effective groundwater management practices. The District's HCP has been formulated and framed in collaboration with other conservation efforts affecting the Covered Species and their respective habitats; that is, the HCP of the City of Austin (COA) for operation and maintenance at Barton Springs Pool and surrounding area, including individual spring outlets (Barton Springs Pool HCP). Well owners and users, especially the District's permittees (the regulated groundwater community), and all citizens who consider Barton Springs an ecological, recreational, and aesthetic resource, are key additional stakeholders for this HCP.

2.0 Descriptions of the Covered Activities Undertaken

The District's ITP allows for continued managed pumping (the covered activity) of the Aquifer by District permittees, provided the proposed HCP measures minimize and mitigate incidental take and avoids jeopardy of salamanders. Ultimately, the HCP measures safeguard continued sustainable use of the Aquifer and survival of the endangered salamanders.

The ITP identifies two categories of Covered Activities: groundwater withdrawals from the Aquifer by nonexempt permittees, and actions necessary to manage potential habitat of the Covered Species in the ITP Area.

2.1 Managing Groundwater Withdrawals

Managing groundwater in its jurisdictional area is the primary purpose of a GCD and managing withdrawals of groundwater in accord with its authorities is a primary activity of a GCD. The District employs a set of groundwater-management activities that relate directly to active management of groundwater withdrawals from the Aquifer (and from all aquifers). These active aquifer-management activities are an essential part of the District's groundwater management scheme and generally recur every year, to include:

- Renewal of existing production permits,
- Processing of new permit applications,

- Installation and operation of wells to monitor groundwater levels and quality,
- Participation in joint groundwater planning with other GCDs in relevant groundwater management areas, and monitoring desired future condition (DFC) efficacy and compliance,
- Monitoring groundwater drought status and informing the District Board of Directors of changes in drought status and need for responsive action,
- Using well site inspections and actual production reports to evaluate compliance with applicable rules and need for potential enforcement actions,
- Evaluating permittees' long-term actual withdrawals compared to authorized amounts and recommending conservation credit awards, and
- Assessing the efficacy of existing rules to protect groundwater systems, to promote conservation measures, achieve and maintain applicable DFCs, and as warranted, recommending possible regulatory improvements for Board consideration. (In this reporting period, the Rules were not required to be amended.)

In addition to the recurring activities above, many other important activities conducted are considered as *indirect* management of the Aquifer. Those indirect activities include:

- Program-supporting scientific investigations and monitoring, educational and outreach programs, internal and external communications and coordination, and legal support actions;
- Initiatives that improve the efficiency and effectiveness of other programs; and
- Activities required for governance and administration of a public agency.

Generally, such activities differ in specifics from year to year. Successful groundwater management of the Aquifer under the HCP requires operation and maintenance of a fully functioning GCD in compliance with all applicable statutes and rules in its entire jurisdictional area.

All specific activities undertaken by the District during this reporting period, whether considered as direct or indirect management of the Aquifer, are described in greater detail in Appendix C of this report. Appendix C is intended to reflect the detailed progress, activities and actions implemented by the District to achieve the HCP minimization measures. Appendix C is an excerpt from the FY 2022 Management Plan Annual Report referred to as, "*Appendix B - Assessment of Progress toward Management Plan Goals and Objectives.*"

The FY 2022 Management Plan Annual Report comprises a supporting complement to this stand-alone "Habitat Conservation Plan Annual Report" and can be viewed in full and downloaded at:

<https://bseacd.org/uploads/FY-2022-Annual-Report-with-App-A-and-B.pdf>

2.2 Managing Potential Habitat of Covered Species

Covered Activities related to managing groundwater withdrawals described above are, by design, intended to protect potential habitat of the Covered Species throughout the Aquifer in an ongoing basis, but especially during critical drought periods when the endangered species are under additional stress. Covered Activities related more directly to management of potential habitat by the District involve decision-making and actions that support the general Biological Goals and the more explicit, quantitative Biological Objectives expressed in the District's HCP report Section 6.1.

(https://bseacd.org/uploads/BSEACD_FinalHCPVol.1-Final-for-Submission-to-FWS-4.19.18.pdf). These measures are intended to ensure that reduction in springflow is minimized and corresponding DO concentrations in perennial spring outlets do not fall below specified minimum values under various springflow conditions. Drought indices of Barton Springs coupled with the Lovelady monitor well are the principal method of managing pumping during drought, and thereby preserving habitat.

Both springflow and DO are measured and reported in real-time by the U.S. Geological Survey (USGS). These data can be found online at:

https://waterdata.usgs.gov/tx/nwis/uv/?site_no=08155500&agency_cd=USGS&

Water levels are measured and reported in real-time by the USGS. These data can be found online at:

https://waterdata.usgs.gov/tx/nwis/uv/?site_no=301237097464801&PARAMeter_cd=72019

Table 3 provides a summary of DO concentration measured and reported by the USGS. The results are well above the minimum concentrations specified in the Biological Objectives. No unanticipated adverse effects of HCP-related activities on water chemistry were documented in the reporting year. Consequently, no extraordinary District actions, beyond those in the Covered Activities and HCP Conservation Measures, were required to actively manage the potential habitat and comply with the Biological Goals and Objectives.

Table 3. Range of Springflow and Dissolved Oxygen (USGS 08155500)

Month	Historic Mean DO (mg/L)	FY22 DO (mg/L)	Historic Mean Flow (cfs)	FY22 Flow (cfs)
Sep-21	5.6	5.6	58	58
Oct-21	5.8	5.6	58	72
Nov-21	5.8	6.0	60	81
Dec-21	5.9	6.1	61	72
Jan-22	6.2	5.9	63	56
Feb-22	6.1	6.6	65	69
Mar-22	5.9	6.4	67	59
Apr-22	5.9	6.0	68	48
May-22	5.5	5.5	70	44
Jun-22	5.6	5.3	72	39
Jul-22	5.5	5.0	68	29
Aug-22	5.5	5.7	62	27
Mean annual	5.8	5.8	64	54.5

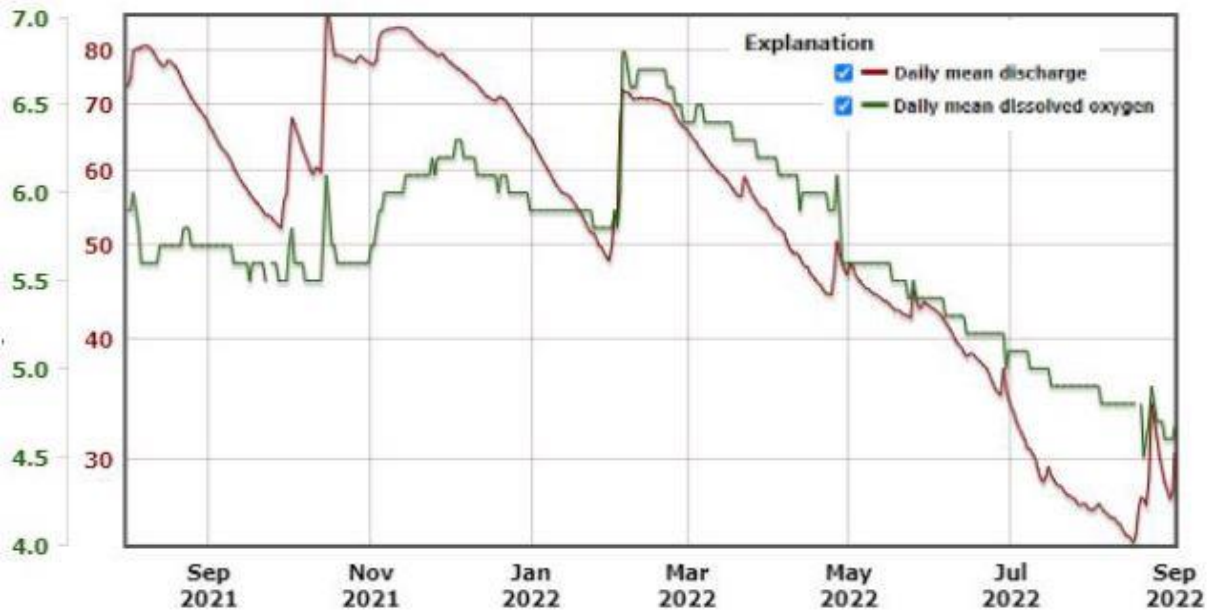


Figure 4. Hydrograph from the USGS of Mean Daily Springflow (cfs) and DO (mg/L) Values During FY 2022

In addition to considerations arising from the HCP Biological Goals and Objectives, there were two additional activities that specifically relate to management of potential habitat in the reporting period. They are as follows:

1. The District's Validation Monitoring Protocol is used annually to determine if new information suggests that the District's take estimate methodology should be re-evaluated. The results of this evaluation will be part of each HCP Annual Report, Section 16.0 Recommendations for Improvement. The current Validation Monitoring Protocol is included in this Annual Report in Appendix A.
2. In FY 2019, the District and COA executed an Interlocal Agreement (ILA) to facilitate data and information sharing between the parties and collaboration on activities directly related to habitat characterization and protection. The ILA enables more efficient implementation of beneficial HCP Conservation Measures, especially Mitigation Measures. The ILA is included in this Annual Report in Appendix B.

3.0 Reported Groundwater Withdrawals from Permitted Wells

The actual volume of groundwater withdrawn from nonexempt wells, i.e., wells with permits issued by the District, is shown in Table 4, along with the authorized permitted production amounts.

Table 4. Actual and Permitted Nonexempt Production by Management Zone

Table 4a. Individual Production Permits (Nonexempt):

FY 2022 Production from Individual Production Permits		
Production Zone	Actual Production	Permitted Production
Edwards	1,556,550,119 gpy	2,666,482,104 gpy
Trinity	211,230,909 gpy	617,156,117 gpy
Austin Chalk or Alluvial	48,116 gpy	2,500,000 gpy
Total (Gallons)	1,767,829,114	3,286,108,221
Total (Acre Feet)	5,425	10,085

Table 4b. Limited Production Permits (Nonexempt General Permits by Rule):

FY 2022 Production from Limited Production Permits		
Production Zone	Actual Production*	Permitted Production
Edwards	12,954,652	62,000,000
Trinity	5,954,961	28,500,000
Austin Chalk or Alluvial	0	0
Total (Gallons)	18,909,613	90,500,000
Total (Acre Feet)	58	278
*Actual production is a volume estimate calculation described in the findings and conclusions of the BSEACD Staff Report 2010. Average annual exempt well production is approximately 104,473 gpy		

In this reporting period, the volume of groundwater actually withdrawn from the Aquifer was considerably below the permitted volume. In aggregate, the amount of groundwater actually withdrawn from the Edwards Aquifer by permitted wells in the reporting period

was 1,569,504,771 gallons or 57.5 percent of to the overall permitted volume of 2,728,482,104 gallons.

A summary of the **permitted production volumes** for each Management Zone is provided below in Table 5.

Table 5. Permitted Production by Management Zone

FY 2022 Permitted Production by Management Zone			
Edwards MZs	Gallons	cfs	acre-feet
Historical (Individual)	2,310,552,596	9.8	7,091
Historical (LPP)	2,500,000	0.011	8
<i>Total Historical</i>	<i>2,313,052,596</i>	<i>9.81</i>	<i>7,092</i>
Conditional (Individual)	355,929,508	1.51	1,092
Conditional (LPP)	59,500,000	0.25	183
<i>Total Conditional</i>	<i>415,429,508</i>	<i>1.76</i>	<i>1,273</i>
Total Edwards Aquifer	2,728,482,104	11.57	8,365
Trinity MZs	Gallons	cfs	acre-feet
Historical (Individual)	617,156,117	2.62	1,894
Historical (LPP)	28,500,000	0.12	87
Total Trinity Aquifer	645,565,117	2.74 cfs	1,981
Other Aquifers MZs	Gallons	cfs	acre-feet
Historical (Individual)	2,500,000	0.01	8
Historical (LPP)	0	0	0
Total Other Aquifers	2,500,000	0.01	8
Total Permitted (All Aquifers)	3,376,547,221 gal	14.32 cfs	10,354 ac ft

A summary of the **estimated exempt use production volumes** for the Edwards is provided below in Table 6.

Table 6. Exempt Production by Management Zone

Edwards Aquifer - Estimated Exempt Wells Production	
Estimated Volume of Exempt Well Production (gpy)*	105,827,876
<i>Estimated volume in cfs</i>	<i>0.45</i>
<i>Estimated number of exempt wells</i>	1012

*2010 BSEACD Staff Report – Avg Exempt Well Use=104,573 gpy

4.0 Reference Well Levels

The primary reference well that the District uses to gauge overall groundwater levels in the Aquifer, determine drought stages that trigger various elements of the District's

drought management program, and estimate take of Covered Species, is the Lovelady well, near the intersection of Stassney Lane and South First Street in South Austin. The hydrograph of this well for the reporting period is shown below in Figure 5.

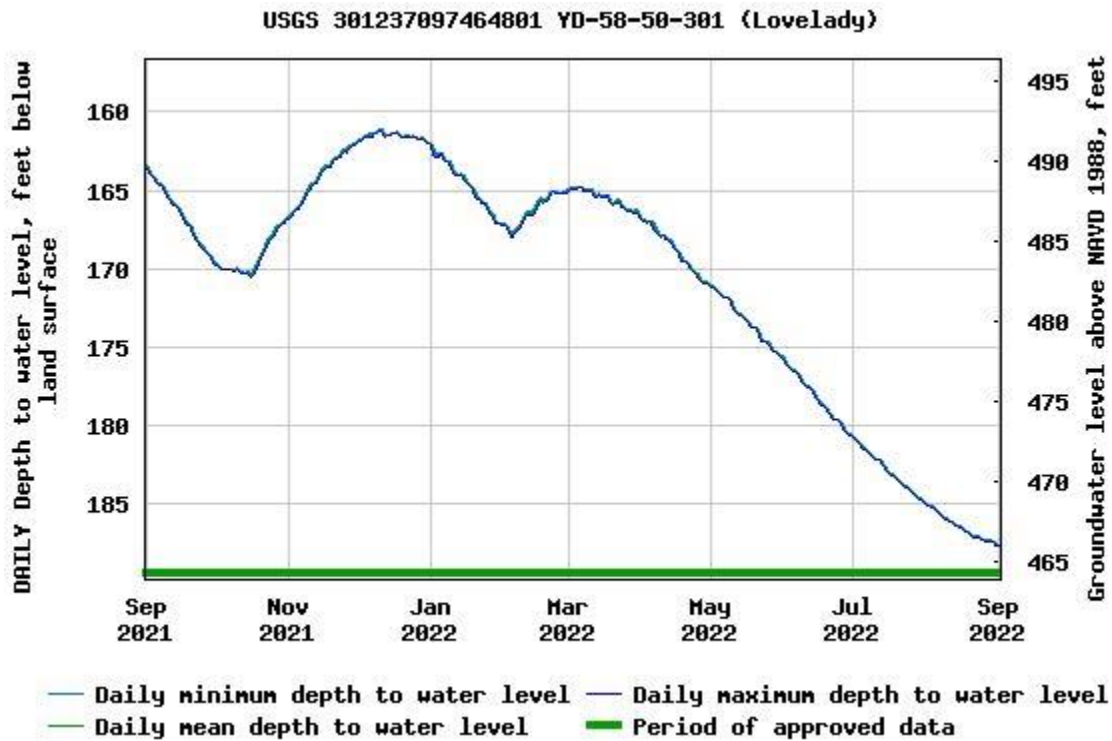


Figure 5. Hydrograph of the Lovelady Water Level Shown as Depth to Water and Elevation

Data from Barton Springs and the Lovelady well informed the drought management determinations by the District’s Board. Following the Drought Trigger Methodology, drought is declared when either Lovelady or Barton Springs reaches their respective thresholds. Nondrought conditions are declared when both Barton Springs and Lovelady well have recovered above the respective drought trigger thresholds. Section 7 describes the drought stage management for this reporting year.

5.0 Springflow at Barton Springs

The hydrograph of the combined springflow at Barton Springs, as indicated by the USGS gage, for the reporting period is shown in Figure 6.

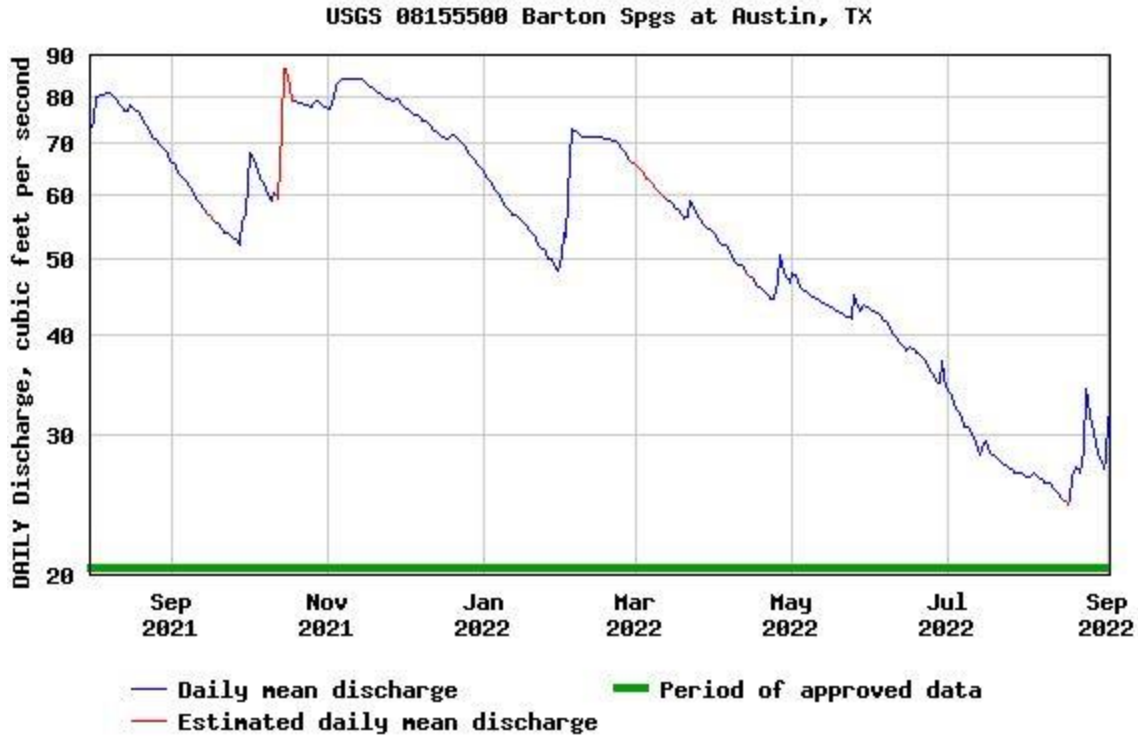


Figure 6. Hydrograph of Daily Mean Barton Springs Flow

Other statistics concerning spring flows during the reporting period are:

- Maximum daily discharge: 86.5 cfs (10/15/21)
- Minimum daily discharge: 24.5 cfs (8/16/22)
- Mean daily discharge: 54.2 cfs

6.0 Total Aquifer Discharge

The determination of total Aquifer discharge in any reporting year requires consideration of measured (metered) discharges from permitted wells, the prevailing estimate of use by exempt wells, gaged measurements of combined discharge at Barton Springs, and an estimate of discharge at Cold and Deep Eddy Springs. There is a large degree of uncertainty about the amount of discharge that may flow to the south into the San Antonio segment of the Edwards Aquifer during high-flow conditions. The total actual discharge from the Aquifer by source during FY 2022 is estimated in Table 7.

Table 7. Estimated Total Discharge from the Barton Springs Segment of the Edwards Aquifer

Discharge Source	FY 2022 Actual Volume (gpy)	Equivalent Monthly Mean Flow Rate (cfs)	Comment
Individual Production Permits	1,556,550,119	6.6	Monthly meter measurements; see Section 3 above
Limited Production Permits by Rule	12,954,652	0.06	See Section 3 above
Exempt Wells	105,827,876	0.45	See Section 3 above
Discharge at Barton Springs	12,797,000,000	54.2	Table 2. Mean daily discharge (USGS)
Discharge at Cold & Deep Eddy Springs	3,490,000,000	14.8	Estimated Mean; cited in Hunt et al., 2019
Total Aquifer Discharge	17,962,332,647	76.1	

7.0 Drought-stage Management Reductions

The District implements a drought management program that requires mandatory monthly pumpage curtailments during District-declared drought stages for all nonexempt permitted wells with individual production permits.

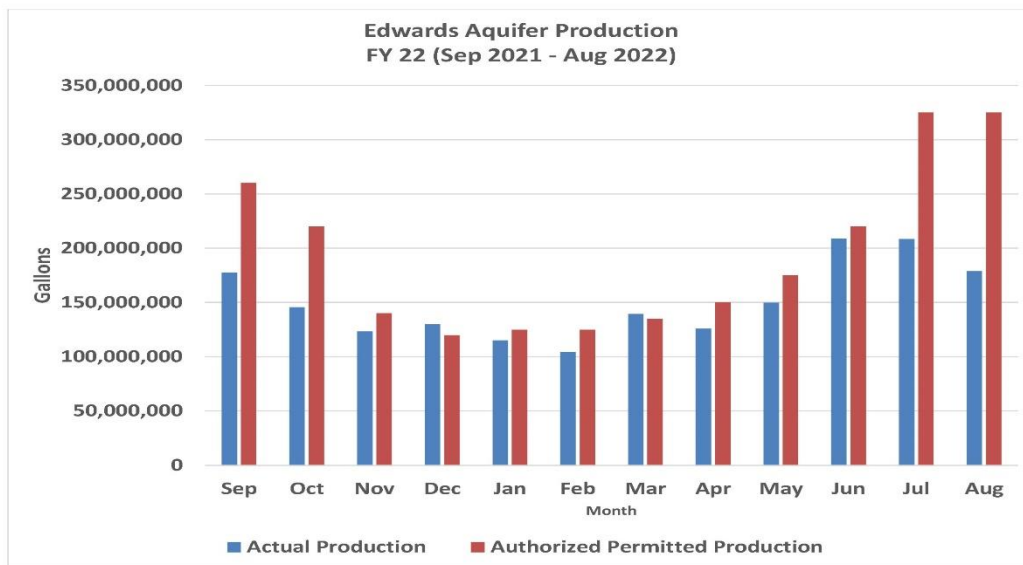


Figure 7. Hydrograph of Monthly Production Limits and Monthly Actual Use

The District was in No Drought status from September 2021 to June 9, 2022 when Alarm Drought status was declared. The District remained in Alarm status until Critical Drought status was declared on October 20, 2022. Figure 7 and Figure 8 reflect the overall trend that collective permittee actual production was on average lower than authorized permitted production allocations, by about 830,000,000 gallons, even during Alarm drought.

It should be noted that other factors such as climatic conditions, seasonal trends, and alternative supply sources can contribute to lower actual use trends even in nondrought. However, as stated in the HCP, the District has demonstrated effective drought curtailments and compliance that correspond to longer and more severe drought conditions, such as in 2009 and 2011.

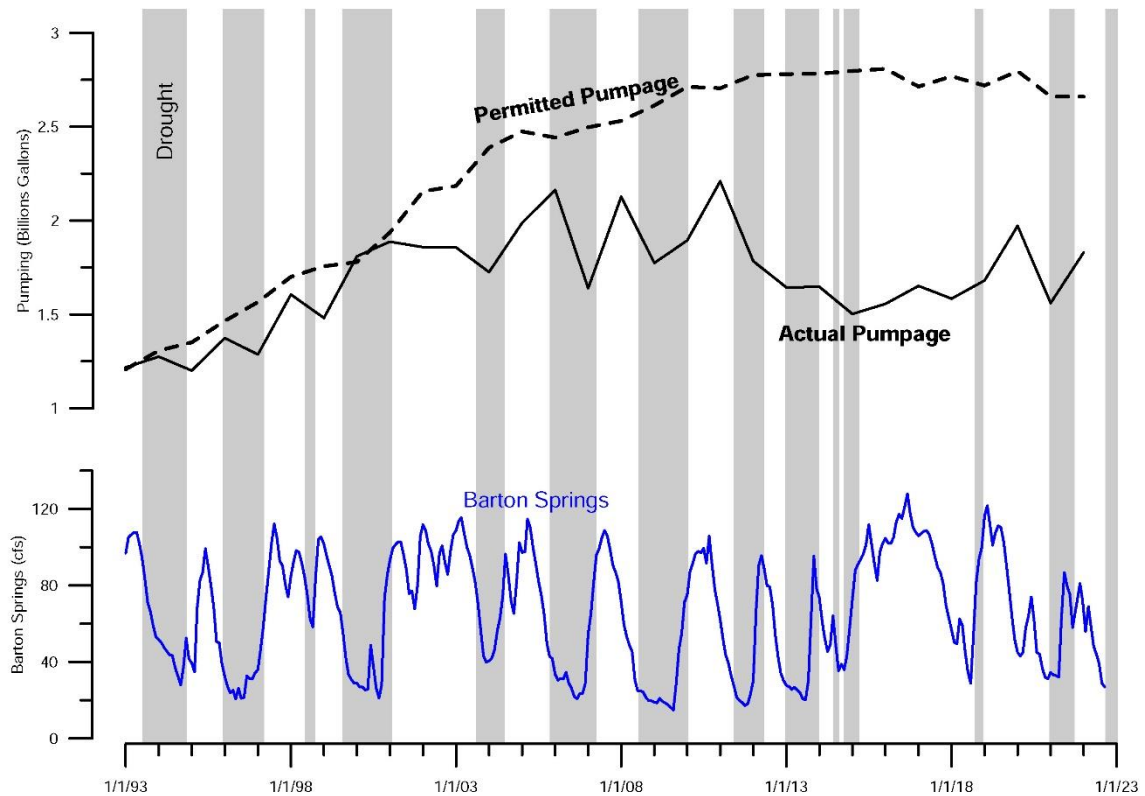


Figure 8. Hydrographs of Edwards Aquifer Production and Barton Springs Flow.

Figure 8 reflects production and spring flow since 1993. The data indicates there has been a trend over the past 20 years of lower total actual production than authorized production in the Edwards Aquifer. This overall trend is likely the result of the District's

efforts in public awareness and drought conservation, promotion and support of Public Water Suppliers' diversification of source supplies, improved water use efficiencies, and key milestones in the District's science and regulatory framework. Some of those milestones include:

- 2004: Sustainable Yield Study and Conditional Production Permits
- 2005: Drought Trigger Methodology
- 2007: Extreme Drought Withdrawal Limitation (EDWL)
- 2009: Ecological Flow Reserve and Management Zones

8.0 Estimated Annual Take for Reporting Period (if any) and Total Cumulative Take for the ITP Term

The actual annual springflow-related take estimate to be included in the District's Annual Report to the Service involves a straight-forward procedure outlined in Appendix A that indicates the relative percentage of time during which springflow is below a given springflow threshold.

The hydrographs and data presented in Section 2 show that springflow was below the 40 cfs threshold for take for 33 days during the reporting period. Analysis of the mean daily spring flow and dissolved oxygen hydrograph (Figure 4) only indicates take of BSS during the 84-day threshold event during the reporting period. Using the Validation Monitoring protocol proposed by the District and approved by the Service for evaluating take (Appendix A), the District calculates the following amounts of take for the reporting period presented in Table 8.

It is estimated that take of 15 BSS occurs under category A when Barton Springs flow is at or decreases below 40 cfs (Table 8; Circumstance A). This is primarily due to Upper Barton Springs ceasing flow and induces negative behavioral effects. It is further estimated that additional take will occur for both species as a function of the number of months when springflow is between 20 and 30 cfs. Springflow between 20 and 30 cfs did occur for 51 days for this reporting period. Springflow below 20 cfs (Table 8; Circumstance C) did not occur for this reporting period.

Table 8. Summary of Take

CIRCUMSTANCE	NO. DAYS	NO. MONTHS	BSS TAKE FACTOR	ABS TAKE FACTOR	BSS SUM TAKE	ABS SUM TAKE	COMMENT
A (<40 CFS)	33	1.10	15	0	17	0	Did Occur
B (30-20 CFS)	51	1.7	174	36.6	296	62	Did Occur
C (<20 CFS)	0	0.00	174	36.6	0	0	Did Not Occur
SUM	84	2.8			313	62	2022 total
					20200	4260	permitted take over 20-yrs
					194	20	Previous year take
					19645	4168	Balance on permit
					2.7%	2.2%	% of total allowed

BSS: Barton Springs salamander; ABS: Austin blind salamander

The estimated take number is derived by the number of months (2.8 months in this case) multiplied by each take factor for each species (Table 8; Circumstance B). Thus, during this reporting period, take of BSS is estimated to have been 313 and take of ABS is estimated to have been 62, using the prescribed methodology. The District assumes that the negative effects were likely behavioral. These amounts of take are added to the previously reported cumulative take amounts, resulting in new cumulative take amounts

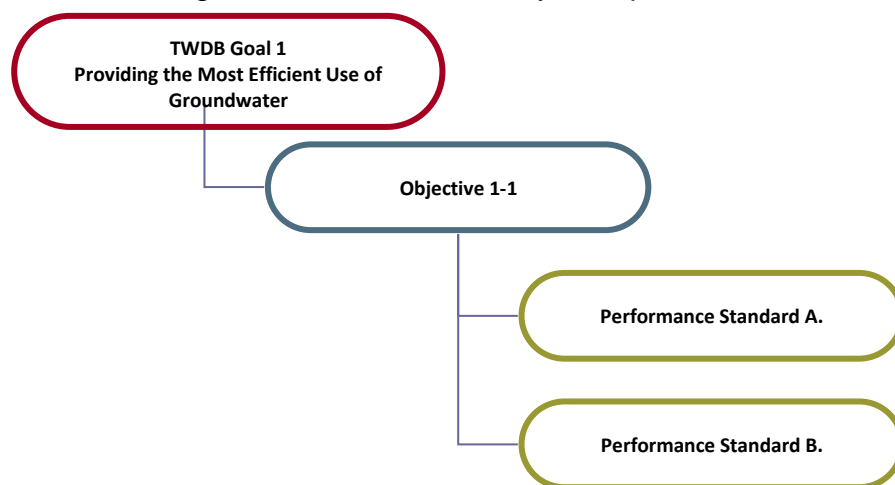
of 555 for BSS and 92 for ABS. For comparison, the authorized total cumulative take estimates for BSS and ABS during the 20-year permit term are 20,200 and 4,260, respectively. This represents 2.7% for BSS and 2.2% for ABS of the authorized total.

There was no take from the DO Augmentation mitigation measure, as those activities in the field have not yet begun.

9.0 Minimization Measures and Action Taken During the Prior Year

Conservation measures to avoid, minimize, and mitigate take by the District are by necessity rooted in the statutory and regulatory requirements for all GCDs in Texas. The Texas Water Development Board (TWDB) has set nine over-arching goals for all GCDs, and in this District, these goals have also been designated as categories of Minimization Measures in its ITP issued by the Service.

Each GCD establishes a hierarchy of objectives and performance standards to achieve its goals that reflect local groundwater management priorities and to ensure its continuing operation as a sustainable organization. The hierarchy is depicted schematically below:



- **Goals** are set by the TWDB. These 9 goals are addressed in the District's Management Plan.
- **Objectives** are set by District Staff/Board. These objectives are the same objectives for the HCP.
- **Performance Standards** are set by District Staff/Board. These performance standards are the same reporting standards that have to be completed for the HCP. Many of these standards have always been reported on in previous Management Plan Annual Reports.

The GCDs' selected objectives and standards are documented in the GCDs' adopted MP and approved by the TWDB every five years.

As a result of its HCP planning, in its current MP, the District prioritized its objectives and performance standards such that HCP Conservation Measures now coincide with the regular and ongoing groundwater and habitat management activities, i.e., the Covered Activities. Thus, by design and with the TWDB approval of the 2022 MP, the District MP's

objectives and performance standards are now aligned with and identical to the District HCP's conservation measures and their performance standards approved by the Service.

A comprehensive, detailed description of the progress, activities and actions taken by the District in the reporting year for each of the HCP Objectives and Conservation Measures is included in Appendix C of this HCP Annual Report.

The FY 2022 Management Plan Annual Report can also be viewed at:
<https://bseacd.org/uploads/FY-2022-Annual-Report-with-App-A-and-B.pdf>

On December 8, 2022, the District's Board of Directors determined that satisfactory progress had been made in FY 2022 toward all goals and objectives of the MP using the relevant performance standards for each.

10.0 Mitigation Actions Taken During the Year, and Updates on Any Ongoing Mitigation Measures

In its HCP, the District identified five mitigation measures intended to offset unavoidable take and to otherwise minimize take further. These are characterized in Table 9 below, along with the progress made for each, as of the end of the reporting period.

Most of these mitigation measures require concurrence and/or involvement of other parties, especially the COA.

The District and the COA finalized and executed an ILA in FY 2019. This ILA, provided in Appendix B, will be instrumental in more robustly pursuing certain aspects of the mitigation measures in the upcoming years. Several of the activities characterized in Appendix C, describing progress toward the over-arching HCP goals, also relate to preparation for mitigation action

Table 9. Summary of Progress on Mitigation Measures

HCP ID No.	HCP Section 6.2.2.2 Mitigation Measures	Progress or Status as of End of FY 2022
M-1	<p>The District commits to supporting the operations of an existing refugium with facilities capable of maintaining backup populations of the Covered Species to preserve the capacity to re-establish the species in the event of the loss of population due to a catastrophic event such as an unexpected cessation of spring flow or a hazardous materials spill that decimates the species habitat. Such supplemental support would be provided through a commitment of in-kind, contracted support, and/or cash contributions that would contribute to:</p> <ul style="list-style-type: none"> a. Continuing the study of salamander physiology and/or behavior, and b. Conserving field and captive populations. 	<p>Under ILA Section VII.E, the City and District agreed that the District would periodically analyze the water chemistry of the source water for the refugium. A groundwater sample was collected from the well at the Nature Center in February 2022 for chemical analysis.</p>
M-2	<p>The District, in cooperation with the City, commits to participating in conducting feasibility studies and as warranted, pilot and implementation projects to evaluate the potential for beneficial subsurface DO augmentation of flow in the immediate vicinity of the spring outlets and improved surface DO augmentation in the outlets (only) during Extreme Drought conditions. In-kind, contracted support, and/or cash contributions, phased during the term of the permit, may be authorized for feasibility studies and, if a project is feasible, for the pilot study and implementation of the augmentation project.</p>	<p>ILA Section VII.A describes the provisions under which these studies will be conducted. No other progress was made in the reporting year.</p>

M-3	<p>The District commits to extending the currently committed time period to operate the Antioch Recharge Enhancement Facility to continue after the 319(h) grant commitments (September 2014 or later), thereby improving recharge water quality and reducing nonpoint-source pollution at the outlets from runoff events during that time.</p>	<p>The facility continues to be operated by the District. Some upgraded controllers were installed in FY 2021 to ensure more responsive operation during variable creek flow conditions.</p>
M-4	<p>The District commits to establishing a new reserve fund for plugging abandoned wells to eliminate high-risk abandoned wells as potential conduits for contaminants from the surface or adjacent formations into the aquifer, with priority given to problematic wells close to the Barton Springs outlets and/or associated with water chemistry concerns under severe drought conditions. This reserve fund, which like others under state law has restrictions on its funding and use, would be established within the first year after issuance of the ITP by closing the existing Drought Reserve Account, whose stipulated purpose has been legal defense for drought management, and then by utilizing its current balance to initially fund a new Aquifer Protection Reserve Account. The new account would exist solely to fund plugging of abandoned wells and would be replenished after the first year with any collected enforcement penalties, any drought management fees imposed on larger nonexempt permittees that do not meet their drought curtailments, and an annual budgeted supplement at the discretion of the Board.</p>	<p>Implementation of key elements of this measure will require modification to existing District Rules and Bylaws language, specifically Rule 3-7.11. Special Drought Reserve Account.</p>

M-5	<p>For the term of the ITP, the District commits to provide leadership and technical assistance to other government entities, organizations, and individuals when prospective land-use and groundwater management activities in those entities' purview will, in the District's assessment, significantly affect the quantity or quality of groundwater in the Aquifer. The District will respond actively and appropriately to legislative initiatives or projects that affect Aquifer characteristics, provided such actions are consistent with established District rules, ongoing initiatives, or existing agreements.</p>	<p>The District has been actively engaged in several activities that relate to this mitigation measure during the reporting period:</p> <ul style="list-style-type: none"> • Worked with various parties in developing groundwater models of the Trinity. These models are the BRAAT model being developed by Southwest Research Institute and a model being developed by the District in house. • Conducted hydrogeologic investigations at Jacob's Well with the installation of two multilevel monitor wells.
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11.0 Evaluation of the Effectiveness of the Avoidance, Minimization, and Other Conservation Measures

The District was in No Drought status from September 2021 to June 9, 2022 when Alarm Drought status was declared. The District remained in Alarm status until Critical Drought status was declared on October 20, 2022. Figure 7 and Figure 8 reflect the overall trend that collectively, permittees' actual production is significantly lower than authorized permitted production allocations even during nondrought conditions. Sustained DO concentrations at the spring outlets have generally been similar to those expected on the basis of the spring flow volumes, which confirms the basis and expected effectiveness for the requisite pumpage reductions for the drought periods.

COA presents data in its 2021 HCP annual report showing that the salamander populations increased during this reporting period, but the increase is within the norms of variability in abundance of such a small population (City of Austin, 2021 Annual Report to Fish and Wildlife Service, January 2022).

As noted in Section 9 above, the District's Board of Directors determined that satisfactory progress was made in FY 2022 toward all HCP MP goals and objectives, using the relevant performance standards for each.

12.0 Adaptive Management Activities Undertaken During the Year, or Indicated as Prudent by Outcomes of the Conservation Program

This reporting period was the fourth one for the District's ITP. No adaptive management activities were identified as needed, and none were undertaken.

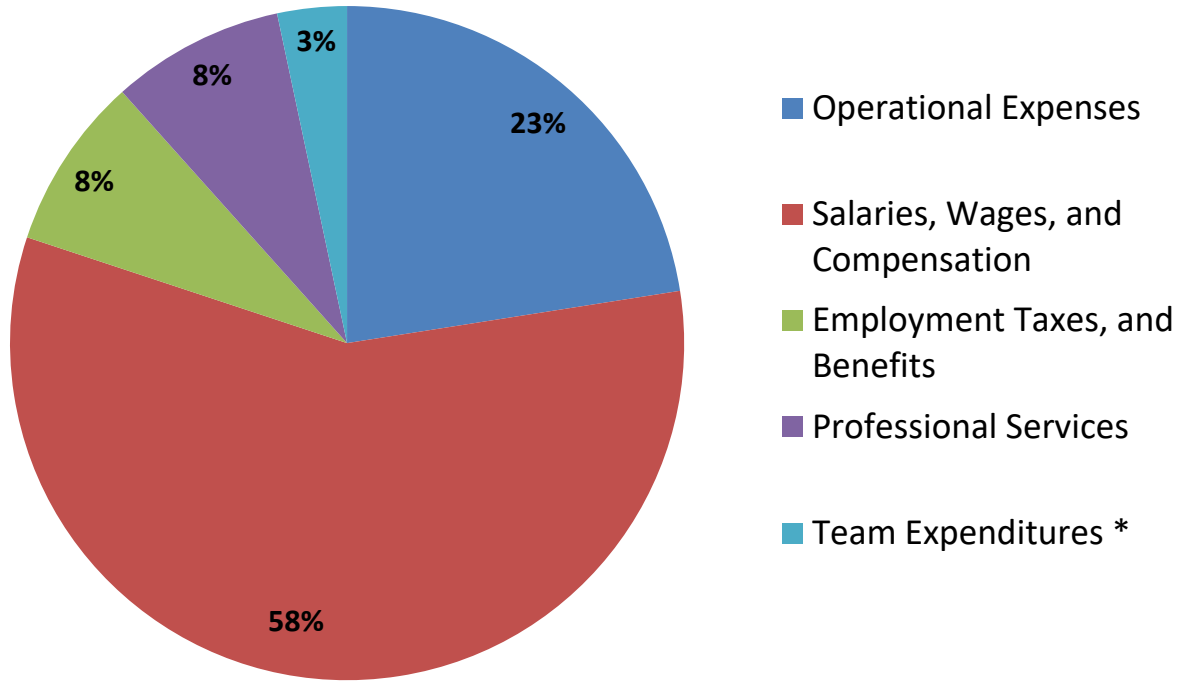
13.0 Expenditures by the District on Implementation Activities

By approval of the MP Annual Report, the District's Board of Directors warrants that there were no FY 2022 expenses incurred that were not directly or indirectly related to the execution of this HCP.

Therefore, 100% of the District expenses shown on the accompanying pie chart were considered HCP expenses and satisfies the minimum commitment funding of no less than 60% of each year's annual budget.

The District's HCP implementation, which integrates the conservation measures and the District's groundwater management program, expended a total of \$1,422,084 in FY 2022. The breakdown of these expenses is shown in Figure 9 below.

FY 2022 Actual Expenditures



A. Operational Expenses	\$320,267	22.5%
B. Salaries, Wages, and Compensation	\$818,576	57.6%
C. Employment Taxes, Insurance, and Benefits	\$117,986	8.3%
D. Professional Services	\$117,865	8.3%
E. Team Expenditures *	\$47,390	3.3%
	\$1,422,084	100.00%

Figure 9. FY 2022 Actual Expenditures

14.0 Species-specific or Aquifer Research Compiled or Completed During FY 2022

The District did not conduct species-specific research in the reporting period. It continues to monitor the ongoing salamander-related studies and assessments by the COA, as documented in its own HCP Annual Report. At this time, no additional cooperatively-funded, species-specific research needs have been identified.

Most of the District's hydrogeologic research in the reporting period was focused on the Trinity Aquifer and in areas outside the ITP Area. However, because the Trinity is directly or indirectly hydrologically connected to the Barton Springs segment of the Edwards and improved knowledge of the Trinity Aquifer supports decision-making for managing the Edwards, such research is relevant to the HCP. Published papers and District documents for FY 2022 are listed below:

- Watson, J. A., Smith, B.A., and J. Camp, 2022, Preliminary Results and Insights from the BSEACD In-house Trinity Model: BSEACD Technical Memo 2022-0520 draft report.
- Smith, B.A., Watson, J.A., and J. Camp, 2022, Preliminary Report on the Installation of Two Multilevel Monitor Wells Near Jacob's Well: BSEACD Technical Memo 2022-0831, 80 p.

15.0 Proposed Activities for Next Year

Activities proposed to take place next year generally relate to a continuation of those organizational activities necessary for the District to meet its ongoing obligations as a GCD and its current commitments, as well as its planned direct and indirect groundwater management initiatives. In prospect, some of these include:

- Continuation of Joint Planning Efforts in the GMAs to adopt DFCs,
- Continuation of model development to support evaluations of the Trinity Aquifer
- Continuation of Trinity Sustainable Yield Study,
- Development and implementation of new database project expected to be completed in early FY 2024. This database will be an integration of data on wells, pumping, geology, and aquifers, and
- Utilization of contractual support associated with various technical and professional services, including:
 - technical services to support prospective special projects including continued aquifer characterization, new monitor well installation, and HCP-related projects;
 - technical and consulting services to support prospective implementation of the HCP including initial annual reporting and mitigation measures; and
 - legal, technical, and consulting services relating to rulemaking efforts.

Even if certain ones of these are not directly or indirectly related to the HCP, they will affect the financial resources that will be available to conduct special projects. However, none of these prospective activities will impede the implementation of work to comply with the HCP.

16.0 Recommendations for Improvement

The District has not identified any changes needed to improve implementation of the HCP or compliance with the ITP provisions at this time.

The Validation Monitoring Program (specified in HCP Section 6.3.1 and included in this Annual Report in Appendix A) anticipates eventual improved take estimate protocol for future use, based on then-new information and/or analyses concerning gaged springflows, water chemistry, and salamander counts. These characteristics form the basis for the take estimate methodology. In the current reporting period, the District has not identified any new information or analysis that would indicate the need for modification of the basis of the take estimate methodology.

17.0 Other Appropriate Information Documenting Compliance with the Permit

None required.

Appendices

Appendix A

Description of District's Validation Monitoring Protocol



**Barton Springs
Edwards Aquifer**
CONSERVATION DISTRICT

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Austin, TX 78748
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July 16, 2019

Ms. Tanya Sommer
U.S. Fish and Wildlife Service
Austin Ecological Services Field
Office I 0711 Burnet Rd., Suite 200
Austin, Texas 78758

Subject: Proposed Validation Monitoring Protocol for HCP under Endangered/threatened
Wildlife Incidental Take Permit # TE 10607C-O

Dear Ms. Sommer:

Per the District's HCP, Section 6.3.1, the Barton Springs/Edwards Aquifer Conservation District is submitting its proposed protocol of the Validation Monitoring Program for review and approval by the Service. This protocol provides a framework that the District will utilize for the following: to document the conformance of the District's groundwater management program with the expected outcomes in the ITP, to assess the amount of take that occurs during the ITP term, and to evaluate impacts of any new relevant information on the take estimate methodology. Such findings would be a precursor to proposing modifications of its groundwater management actions, as necessary.

Should you have any questions about this proposed protocol, please contact me by phone at 512-282-8448 or by email at areinmund@bseacd.org. We would appreciate your expeditious review, comments, and concurrence.

Sincerely,

A handwritten signature in blue ink that reads "Alicia Reinmund-Martinez". The signature is fluid and cursive, with the first name being the most prominent.

Alicia Reinmund-Martinez
General Manager

cc: David A. Johns **P.G.**
Program Manager/Geologist
City of Austin

Proposed Protocol for the District's Validation Monitoring Program

The District's HCP Section 6.3.1 requires the formulation and approval of a "validation monitoring program" and subsequently its recurrent use to inform annual reporting under the HCP. The purpose of this program is "to measure future success of Aquifer-management activities, and to modify management actions on the basis of new information." Among other things, the program requires the District, in the first year of the ITP term, to "collaborate with the COA to formulate a methodology for monitoring and evaluating take associated with the District's Covered Activities." The program also involves an annual re-examination of "[information from] existing springflow gaging, water chemistry monitoring, and salamander censuses, supplemented by new data collection and analyses by the COA", which in aggregate serve as the basis for the take estimate methodology.

During the extended time required to develop the HCP and in particular the lengthy time between developing the preliminary draft HCP and finalizing the final HCP, the District and COA were able to collaborate on a workable approach to an initial and continuing take estimate methodology that related specifically to the District's Covered Activities and to the cryptic characteristics of these Covered Species. This methodology is synopsised in the "Take Logic Diagram" in the Final HCP (Figure 5-8) and reproduced in this document. The take estimate methodology uses the three elements identified above, viz., gaged springflow, monitored water chemistry, and salamander surveys and censuses, in defining take categories and their estimated amounts. This methodology was used for estimating the total amount of take that was permitted in the initial ITP.

The validation monitoring program requires a re-examination of the take logic methodology as significant new information on these three elements becomes available. Further, the approved Interlocal Agreement between the District and the City's Watershed Protection Department specifically authorizes and requires, among other things, the sharing of new information that will inform this recurrent re-examination process. But until revisions are identified as needed and ultimately approved, the annual reporting of take estimates will utilize the methodology and parameters described in the approved HCP.

Re-examination of Basis for Take Estimate Methodology

At least once per year, nominally beginning two months before the District HCP's annual report is submitted to the Service, the District will explicitly assess whether or not new information indicates that the take estimate methodology needs to be modified to account for factors that would change the Take Logic Diagram. This annual re-examination of the basis for the take estimates will involve considering the following questions related to the three elements used to develop the Take Logic:

1. Does new information indicate that the size and/or distribution of the populations of either Covered Species, whether in the near-field or far-field, is substantively statistically different than that characterized in the HCP and used in estimating take?
2. Does new information indicate that the dissolved-oxygen concentration thresholds for the onset of behavioral and/or physiological effects on the Covered Species are substantively statistically different than those used in the Take Logic Diagram?
3. Does new information indicate that the relationship between sustained dissolved-oxygen concentrations and springflow discharges are substantively statistically different than those used in the Take Logic Diagram?

4. Does new information indicate that there are substantive antagonistic or synergistic effects on the Covered Species that are not adequately included in estimating take, e.g., impacts of other springflow-related water chemistry components on the Covered Species by the District's Covered Activities or Conservation Measures?
5. Does new information indicate that there are new and/or different adverse effects on the Covered Species from nonspringflow related activities associated with the District's Covered Activities or Conservation Measures?
6. Does new information indicate that the relationship between groundwater withdrawals and combined springflow during drought periods, e.g., changes in other parameters in the water balance, is significantly different than that used in estimating take during the term of the ITP?

This re-examination will be made by the District's Aquifer Science team and will utilize then-existing data and information provided to the District by the City of Austin under the ILA, public scientific data and reports from the US Geological Survey, other scientific reports and studies, as well as the District's own data collection and analysis activities. New information may arise during the course of each year of the ITP term from new hydrological or biological modeling results, new salamander survey or census data and estimates, or new groundwater sampling and analysis. Any affirmative responses to the questions enumerated above will be elaborated and documented as part of the District's annual reporting to USFWS, including possible recommendations for additional investigations in subsequent years to further assess changes in the take estimate logic and basis. It seems likely that there will be no significant changes to the take estimate basis during the early years of the ITP term. By the same token, it may require multiple years to confirm that some such changes have occurred on a sustained basis and/or additional research to demonstrate how such changes can be best accommodated in revising future take estimates.

Estimation of Take during Each Reporting Period

The actual annual springflow-related take estimate to be included in the District's Annual Report to the Service involves a rather straight-forward procedure:

1. The daily hydrograph from the USGS gage, converted to indicate the calibrated spring flows at Barton Springs, is produced for the 365 days that comprise the current reporting period by the District's Aquifer Science team. The hydrograph may be modified by the District on the basis of manual measurements to supplement the USGS data.
2. The District's Aquifer Science team will disaggregate the hydrograph and identify the cumulative number of days during that reporting period that are in each of the following: No Take, Take Category A, Take Category B, and Take Category C, as defined in the Take Logic Diagram (referring to rate of springflow).
3. The number of months, to two decimal places, that are in each of those four categories is calculated.
4. Category A, regardless of number of months, is assigned a take estimate of a) 15 for the Barton Springs salamander, and b) 0 for the Austin blind salamander.
5. The number of total months assigned to the Categories B and C is multiplied by a) the monthly Take Factor shown in the Take Logic Diagram for the Barton Springs salamander (174/month), and b) the monthly Take Factor for the Austin blind salamander (36.6/month).
6. The estimated springflow-related take of BSS for the reporting period is the sum of the results of Steps 4(a) plus 5(a).

7. The estimated springflow-related take of ABS for the reporting period is simply 5(b), since the take of ABS in Category A is zero (because ABS habitat is not recognized at Upper Barton Springs).

As necessary, the District's Aquifer Science team will also estimate whether and what take of one or both endangered species was generated by occasional, nonspringflow-related District activities (like well construction *per se*), and add the springflow and nonspringflow take for annual reporting.

The calculated results of this procedure inform and are input into the HCP Annual Report, Section 7 and will be summarized as follows:

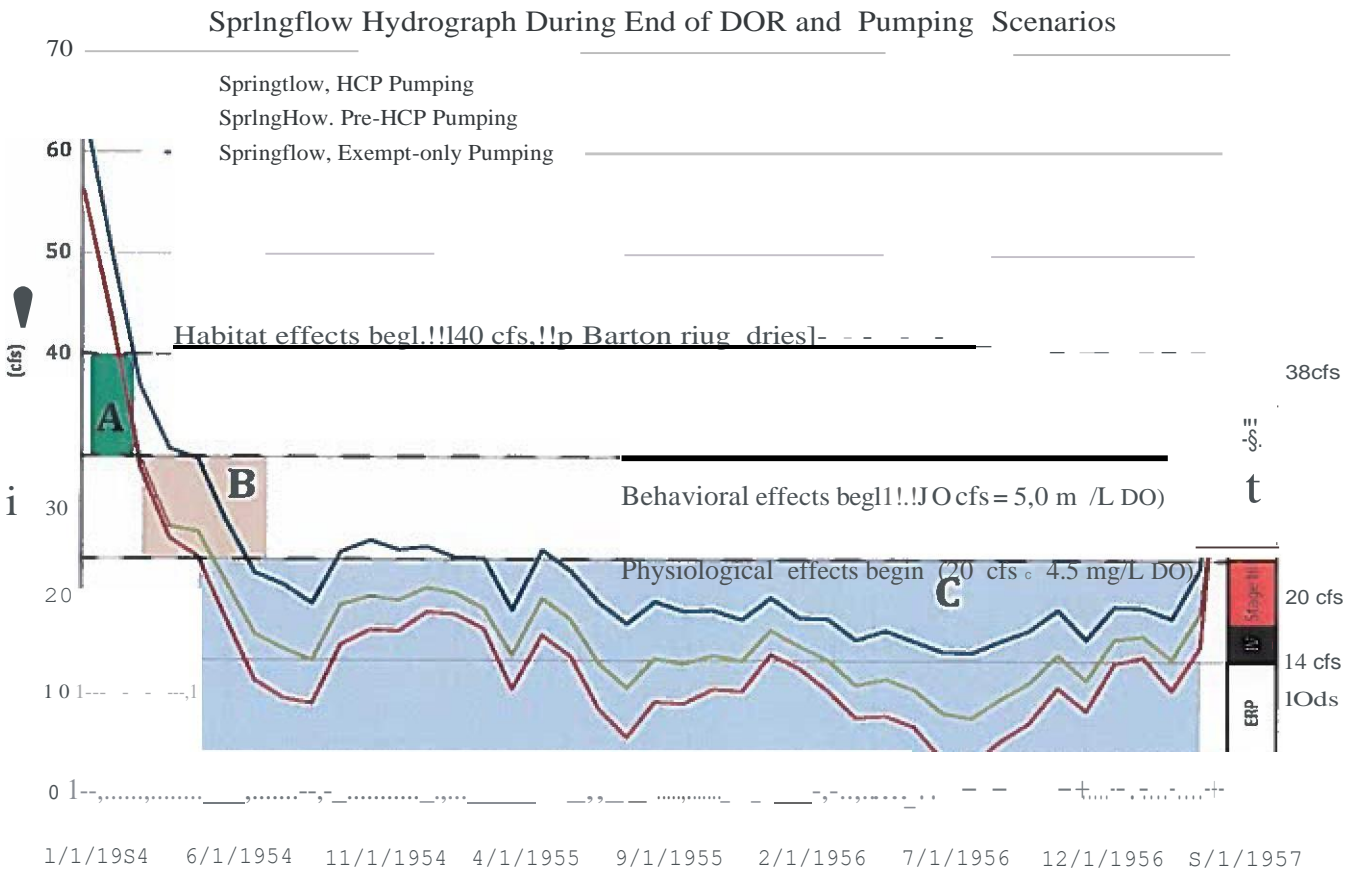
Take Type	Take Category	Inclusive Dates	No. of Months*	BSS Take Factor	Estimated BSS Take	ABS Take Factor	Estimated ABS Take
Springflow-Related	A#1	TBD-TBD	2.25	-	15	0	0
	A#2	TBD-TBD	0.60		15	0	0
	B	TBD-TBD; TBD-TBD	6.45	174	1122	36.6	236
	C	TBD-TBD	2.45	174	426	36.6	90
Occasional, Other	-	MM/DD/YYYY	N/A	N/A	I	N/A	0
Totals			11.75		1579		326

* The values shown for "number of months" are fictitious and are provided for illustrative purposes only. The actual values will be based on the disaggregation of the actual Barton Springs hydrograph for each reporting period by the District's Aquifer Science team.

During this reporting period, which was nominally in some degree of drought for almost the entire time, the take of Barton Springs salamander would have been estimated to be 1579 and take of Austin blind salamander estimated to have been 326, using the prescribed methodology. These amounts of take would be added to the previously reported cumulative take amounts, resulting in new cumulative take amounts of ___ for BSS and _ for ABS. (For comparison, the authorized total cumulative take estimates for BSS and ABS during the 20-year permit term are 20,200 and 4,260, respectively.)

Monthly "Take Factor" Logic Diagram

We conservatively estimate total Incidents of take from a 37-month period at the end of the Drought of Record. During the springflow recession we qualitatively estimate take relating to various habitat, behavioral, and physiological effects and thresholds. From this discrete drought a monthly takefactor was developed to estimate potential monthly take each time springflows are less than 30 cfs (< 5.0 mg/L DO), the take Initiation threshold.



Species	Stipulated Population	Take Circumstance			Total Take (A+B+C)	Months below 30 cfs	Take FKT or C monthly below 30 ds
		A Upper BS	B Behavioral Effects	C Physiological Effects			
BSS	4988	15	4988	29% x 4988 = 1447	6450	2+35*37	6450/37 = 174
ABS	1050	0	1050	29% x 1050 = 305	1355	2+35*37	1355/37 = 36.6

A: Entire stipulated population at upper Bart. Spring excursions mostly sub-lethal take because pumping hastens drying of habitat.

B: Spnn 11 months (5.0 mg/L DO): Up to 100% of the stipulated population eventually experience take because decreased DO from pumping causes behavioral effects that are mostly sub-lethal during these two months.

C: Spnn 11 months (4.5 mg/L DO): Up to 29% of stipulated population potentially experience take because decreased DO from pumping contributes to use adverse physiological effects ranging from sub-lethal to lethal as the depth and duration or duration increase. 29% derived from ratio of average pumping to average minimum discharge for the 35 months (4.6 cfs/16.7 cfs = 29%). Note: average DO at Main spring for the period is 3.7 mg/L.

Take Factor will be used to estimate potential take of the BSS and ABS each month springflow is < 30 cfs, the take initiation threshold.

Appendix B

Interlocal Agreement Between the District and City of Austin

Available upon request of the District

Appendix C

Assessment of Progress on HCP Minimization Measures (Appendix B of Management Plan Annual Report FY 2022)

FY 2022

Appendix B of Management Plan Annual Report

**Assessment of Progress Toward
Management Plan Goals and Objectives**

Board-approved December 8, 2022

GOAL 1 - PROVIDING THE MOST EFFICIENT USE OF GROUNDWATER

31 TAC 356.52(A)(1)(A)/TWC §36.1071(A)(1)

Objective 1-1. Provide and maintain on an ongoing basis a sound statutory, regulatory, financial, and policy framework for continued District operations and programmatic needs.

Performance Standards

A. Develop, implement, and revise as necessary, the District Management Plan (MP) in accordance with state law and requirements. Each year the Board will evaluate progress towards satisfying the District goals. A summary of the Board evaluation and any updates or revisions to the MP will be provided in the Annual Report.

In FY 2022, the District continued to implement its MP that was approved by the Texas Water Development Board (TWDB) on November 21, 2017. No revisions or amendments to the MP were presented or made.

In order to achieve the goals, management objectives, and performance standards adopted in the MP, on December 8, 2022, the District's Board of Directors (Board) evaluated progress made, and approved the District's FY 2022 Annual Report and Appendix B (Assessment of Progress toward Management Plan Goals and Objectives). Appendix A (the annual financial audit) was also presented at the December 8, 2022 Board Meeting.

B. Review and modify District Rules as warranted to provide and maintain a sound statutory basis for continued District operations, and to ensure consistency with both District authority and programmatic needs. A summary of any rule amendments adopted in the previous fiscal year will be included in the Annual Report.

During FY 2022, there were no new rules or rule amendments adopted by the Board.

Objective 1-2. Monitor aggregated use of various types of water wells in the District, as feasible and appropriate, to assess overall groundwater use and trends on a continuing basis.

Performance Standard

Monitor annual withdrawals from all nonexempt wells through required monthly or annual meter reports to ensure that groundwater is used as efficiently as possible for beneficial use. A summary of the volume of aggregate groundwater withdrawals permitted and actually produced from permitted wells for each Management Zone (MZ) and permit type will be provided in the Annual Report.

A summary of the actual versus permitted production volumes for each MZ is also provided below.

FY 2022 Production from Individual Permittees		
Production Zone	Actual Production	Permitted Individual Production
Edwards	1,556,550,119	2,666,452,104
Trinity	211,230,909	617,156,117
Austin Chalk or Alluvial	48,116	2,500,000
Total (Gallons)	1,767,829,114	3,286,108,221
	(5,425.27 ac ft)	(10,084.69 ac ft)

FY 2022 Production from Limited Production Permits		
Production Zone	Actual Production*	Permitted Limited Production
Edwards	12,954,652	62,000,000
Trinity	5,954,961	28,500,000
Austin Chalk or Alluvial	0	0
Total (Gallons)	18,909,613	90,500,000
	(58.03 ac ft)	(277.73 ac ft)
<i>*Actual production is a volume estimate calculation described in the findings and conclusions of the BSEACD Staff Report 2010. Average Annual exempt well production is approximately 104,473 gpy</i>		

Objective 1-3. Evaluate quantitatively at least every five years the amount of groundwater withdrawn by exempt wells in the District to ensure an accurate accounting of total withdrawals in a water budget that includes both regulated and nonregulated withdrawals, so that appropriate groundwater management actions are taken.

Performance Standards

Provide an estimate of groundwater withdrawn by exempt wells in the District using Texas Department of Licensing and Regulation (TDLR) and TWDB databases, and District well records; and update the estimate every five years with the District’s MP updates.

This is a joint effort between the Aquifer Science, Communications and Outreach, and Regulatory Compliance teams. The next estimation of exempt wells is expected to take place with the next update of the District’s MP (2022).

In the interim years between MP updates, the most current estimates of exempt well withdrawals will be included in a summary of the volume of aggregate groundwater withdrawals permitted and actually produced from permitted wells for each MZ and permit type that will be provided in the annual report.

A summary table of the [estimated exempt well production volumes](#) for the Edwards and Trinity MZs is provided below.

**Edwards Aquifer –
Estimated Exempt Wells Production**

Average Annual Volume per Exempt Well (gpy)	104,573
Total Est Volume of Exempt Well Production (gpy) *	105,827,876
<i>Est # of wells</i>	1012
<i>cfs</i>	0.45
<i>% of Permitted Production</i>	3.9%
<i>Permitted Edwards Production(gpy)</i>	2,728,482,104

*2010 BSEACD Staff Report – Avg Exempt Well Use=104,573 gpy

**Trinity Aquifer –
Estimated Exempt Wells Production**

Average Annual Volume per Exempt Well (gpy)	104,573
Total Est Volume of Exempt Well Production (gpy) *	120,572,669
<i>Est # of wells</i>	1153
<i>cfs</i>	0.51
<i>% of Permitted Trinity Production</i>	18.7%
<i>Permitted Trinity Production (gpy)</i>	645,565,117

*2010 BSEACD Staff Report – Avg Exempt Well Use=104,573 gpy

Objective 1-4. Develop and maintain programs that inform and educate citizens of all ages about groundwater and springflow-related matters, which affect both water supplies and salamander ecology.

Performance Standards

Publicize District drought trigger status (Barton Springs ten-day average discharge and Lovelady Monitor Well water level) in monthly eNews bulletins and continuously on the District website.

The home page of the website has the District’s drought trigger levels prominently displayed. There is a small banner at the very top of the page showing the current drought status. However, there is a much larger banner on the upper half of the page, also showing the current drought status. The Aquifer Science/Drought Status page was visited approximately 1,331 times through FY 2022. The drought status is shared under highlights on the home page of the website, on the newsroom page, and the press release page when there is a change to the drought status.

Drought status updates are also shared across all District social media channels (Twitter, YouTube, Facebook, Instagram, Nextdoor). The Lovelady and Barton Springs levels are shared a few times a month on the District’s social media channels and website to let the permittees and general audience know how high or low the levels are going, and also when we may cross into the next drought stage.

In addition, drought status information has been shared in a new monthly drought report sent out to permittees/subscribers through eNews. The report is then shared on the District’s social media channels and website. Included below are the drought reports/videos that have been released since the District went into alarm drought stage in June 2022.

- Drought Update – July 20, 2022 - <https://bit.ly/3PHv5pr>
- Drought Update – August 25, 2022 - <https://bit.ly/3elxFUV>
- Drought Update – Sept. 22, 2022 - <https://www.youtube.com/watch?v=FfGXv474T-U&t=3s>
- Drought Update – Aug. 17, 2022 - <https://www.youtube.com/watch?v=WGiQ4-aAIWs&t=5s>
- Drought Update/Well Monitoring–July 26 - <https://www.youtube.com/watch?v=HpLznZZ7QYE&t=4s>
- Aquifer District Declares Stage II Drought –June 9, 2022-<https://www.youtube.com/watch?v=wJ5KiC>

Provide summaries of associated outreach and education programs, events, workshops, and meetings in the monthly team activity reports in the publicly-available Board backup.

- **Protect Your Groundwater Day:** September 7, 2021. The Communications and Outreach Team put together a video with Principal Hydrogeologist Brian Smith, regarding how the District protects groundwater.
- **MyPoint.TV:** MyPoint.TV is a new online news company in Austin that uses public and eyewitness reporting to give everyone the opportunity to publish stories that matter to them. The District has an account and shares videos from time to time on their site. They don't have a huge reach, but this is another tool that gives the District access to a broader audience and allows the District to educate more than just its jurisdiction on aquifer/water related issues. This is a continued collaboration from FY 2021.
- **Explorers Guide to the Hill Country Oasis:** The District once again sponsored Save Barton Creek Association's Explorers Guide to the Hill Country Oasis. The District budgeted \$1,000 for the sponsorship.
- **Imagine a Day Without Water:** October 21, 2021. Communications and Outreach shared several posts highlighting staff, the District's mission, and other facts around groundwater.
- **2022 Summer Aquatic Science Adventure Camp Scholarship Essay/Art Contest:** The District offered several scholarships (overnight and day camp options) to attend the 2022 Edwards Aquifer Research and Data Center's Aquatic Science Adventure Camp at Texas State University in San Marcos. The Aquatic Camp returned after being canceled for two years due to covid. Scholarships were awarded to ten students. Total scholarship funding was \$6,360.
- **2022 Kent S. Butler Memorial Groundwater Stewardship Scholarship Essay Contest:** The District conducted its annual Kent. S. Butler Memorial Groundwater Stewardship Scholarship Essay Contest. Three high school scholarship winners were selected. Total scholarship funding was \$4,500.
- **Texas Alliance of Groundwater Districts (TAGD) Information and Education Committee:** Communications and Outreach Manager is part of TAGD's Information and Education Committee. As part of the committee, Communications and Outreach reviewed sections of the communications toolkit that is being worked on. This included reviewing the newsletter guide, advocacy checklist, open meetings guide, introduction to communications channels, and how to use the toolkit. Communications and Outreach also assisted TAGD with creating a media relations cheat sheet. The document serves as a guide for employees in Texas groundwater conservation districts (GCDs) on how to handle communications for a variety of platforms. It also addresses how to communicate during specific situations.
- **National Cave and Karst Management Symposium 2021:** Communications and Outreach attended this Symposium in San Marcos from November 1 to November 5. This included setting up a table at the symposium.

- **Water Well Checkup:** The District teamed up with Texas A&M Agrilife Extension and Texas Well Owner Network to provide Water Well Checkups for District well owners. The cost of the water analysis was covered by the District for the first fifty well owners to pick up a water kit. The samples were taken to Luling for analysis. Results were physically mailed to well owners and emailed. There were over twenty-five permittees that took part in the program.
- **Water Week Owners Educational Event:** Communications and Outreach Manager, and Regulatory Compliance Team Leader spoke at this event educating the audience on the District. This took place at Luling Foundation Headquarters in Luling on March 3, 2022.
- **Buda Trash-Off:** The District sponsored the City of Buda's Trash-Off in April 2022. People gathered to pick up trash around Buda for the event. Communications and Outreach set up an informational table at the event.
- **BUDA ASR Article for Fall 2021 Newsletter:** Communications and Outreach worked with City of Buda Water Resources Coordinator Blake Neffendorf on BUDA ASR article for the District newsletter. Communications and Outreach also worked with City of Buda Communications Department.
- **City of Sunset Valley Public Works Open House:** Communications and Outreach was invited to take part in the City of Sunset Valley Public Works Open House. The District set up an informational table and Communications and Outreach Manager answered resident questions.
- **Caves, Mud, and Water Event:** Communications and Outreach volunteered at the Caves, Mud, and Outreach event at the Wildflower Center on June 30, 2022. This is put on by the Austin Watershed Protection Department, Park Rangers, and Wildland Conservation Division.
- **UT Jackson School of Geosciences Hydrogeological Field Trip:** Students with the UT Jackson School of Geosciences visited Jacob's Well and the District's new multiport monitor well in Wimberley. Communications and Outreach took photos and shared on social media.
- **TWDB Monitor Well Visit/Video Shoot:** The TWDB came out on May 12, 2022, to shoot a video on a second monitor well installation near Jacob's Well. The District collaborated with TWDB on the shoot, and they interviewed Aquifer Science Principal Hydrogeologist. The video was shared on the District's social media channels and in the newsletter.
- **Edwards Aquifer Authority (EAA) Research Center/Education and Outreach Center Visit:** Staff went on a retreat to the EAA Research Center and visited the new Education Outreach Center. Communications and Outreach took photos and shared information about the visit on the District's social media channels.

- **Regional Water Quality Planning Group Meeting:** Communications and Outreach began coordinating the monthly Regional Water Quality Planning Group meetings, which take place the last Friday of every month. This group is comprised of stakeholders from various organizations focused on protecting water here in Central Texas.
- **Community Meeting – Rolling Oaks Neighborhood:** The District held a community meeting in the Rolling Oaks Neighborhood on August 6, 2022. The meeting focused on the current drought, along with a question-and-answer session for those in attendance. Director Dan Pickens and staff attended. Communications and Outreach set up an informational table and signed up those in attendance for the District’s newsletter/press releases. The meeting was recorded and shared on the District’s social media channels and website.

This summary may also be found in the Communications and Outreach Team section of the Annual Report.

Objective 1-5. Ensure responsible and effective management of District finances such that the District has the near-term and long-term financial means to support its mission.

Performance Standards

Receive a clean financial audit each year. A copy of the auditor’s report will be included in the Annual Report (as Appendix A).

The Board expects to receive and approve the FY 2022 Annual Financial Audit report provided by the District’s financial auditor at its Board Meeting on December 8, 2022. It will be included in the Annual Report as Appendix A.

Timely develop and approve fiscal-year budgets and amendments.

In FY 2022, there were two budget versions. The initial budget was brought before the Board in a properly-noticed public hearing held on July 8, 2021 where it was approved. The Board approved Budget Revision 1 on October 14, 2021.

Objective 1-6. Provide efficient administrative support and infrastructure, such that District operations are executed reliably and accurately, meet staff and local stakeholder needs, and conform to District policies and with federal and state requirements.

Performance Standards

Maintain, retain, and control all District records in accordance with the Texas State Library and Archives Commission-approved District Records Retention Schedule to allow for safekeeping and efficient retrieval of any and all records, and annually audit records for effective management of use, maintenance, retention, preservation and disposal of the records’ life cycle as required by the Local Government Code. A summary of records requests received under the Public Information Act (PIA), any training provided to staff or directors, or any claims of violation of the PIA will be provided in the Annual Report under the General Management Team Highlights.

The Administration Team is responsible for proper maintenance, management, retention, and disposition of all District records; inventory of District property (asset management); and capital depreciation. Administration preserved and protected all public documents in accordance with state and federal laws, the adopted District Records Retention Schedule, and with the Texas State Library regulations; and maintained the District's reference material library.

District records were maintained effectively, and there were no violations of the PIA.

Develop, post, and distribute District Board agendas, meeting materials, and backup documentation in a timely and required manner; post select documents on the District website, and maintain official records, files, and minutes of Board meetings appropriately.

The Administration Team developed, posted, and distributed all materials and backup documentation for all 10 District Regular Meetings and one Special Called Meeting held in FY 2022. There were also two Public Hearings. All meeting minutes were approved by the Board at a subsequent meeting. Administrative staff maintained the official records of each meeting on the District's website and in the District's library.

Objective 1-7. Manage and coordinate electoral process for Board members.

Performance Standard

Ensure elections process is conducted and documented in accordance with applicable requirements and timelines. Election documents will be maintained on file, and a summary of elections-related dates and activities will be provided in the Annual Report for years when elections occur.

The District holds elections no more often than every two years (in odd-numbered fiscal years, if and when election contests warrant).

There was a vacant position on the Board of Directors due to a resignation from the director in Precinct 3. Lily Lucas was appointed by the Board to fill that vacancy in December 2021.

Three director precincts (precincts 2, 3, and 5) were up for a possible election during FY 2022 for the November 8, 2022 election (FY 2023). Two directors were unopposed, and the third resigned and a new director took his place with no opposition. Since there was no opposition for any of the three directors, the election was cancelled.

GOAL 2 - CONTROLLING AND PREVENTING WASTE OF GROUNDWATER

31 TAC 356.52(A)(1)(B)/TWC §36.1071(A)(2))

Objective 2-1. Require all newly drilled exempt and nonexempt wells, and all plugged wells to be registered and to comply with applicable District Rules, including Well Construction Standards.

Performance Standard

A summary of the number and type of applications processed and approved for authorizations, permits, and permit amendments including approved use types and commensurate permit volumes for production permits and amendments will also be provided in the Annual Report.

To ensure that all firm-yield production permits are evaluated with consideration given to the District's demand-based and nonspeculative permitting standards, staff completed comprehensive administrative and technical reviews of permit application requests. A summary of the number and type of applications processed and approved for authorizations, permits, and permit amendments, including approved use types and commensurate permit volumes for production permits and amendments, is provided below.

A summary of the [processed permitting applications](#) in FY 2022 is provided in the table below.

Processed Permit Applications	FY20	FY21	FY22
Minor Amendment	3	4	5
Major Amendments	0	0	0
New Exempt Well	2	9	11
Limited Production Permit (Nonexempt Domestic Wells)	9	15	10
Individual Production Permit	5	1	4
Individual Well Drilling Authorizations or Well Modification	2	1	0
Test Well	0	0	0
Well Plugging	6	5	9
Replacement Well	0	0	0
TOTAL	28	35	39

A summary of the [individual production permits processed](#) in FY 2022 is provided in the table below.

Annual Volume (gpy)	Production Permits Processed	Permit Type	Use Type	Aquifer
300,000	Confido, LLC	Class A Conditional	Commercial	Edwards
130,500	17050 S IH-35 Frontage Road, LLC	Class A Conditional	Commercial	Edwards
1,834,560	Goebler Properties, Inc.	Class A Conditional	Commercial	Edwards
943,500	Texas Legacy Masters, LLC	Historic	Commercial	Middle Trinity

Objective 2-2. Ensure permitted wells and well systems are operated as intended by requiring reporting of periodic meter readings, making periodic inspections of wells, and reviewing pumpage compliance at regular intervals that are meaningful with respect to the existing aquifer conditions.

Performance Standards

Inspect all new wells for compliance with the Rules, and Well Construction Standards, and provide a summary of the number and type of inspections or investigations in the Annual Report.

During FY 2022, the Regulatory Compliance Team conducted a number of inspections relating to the processing of permit applications. Staff completed a total of 13 inspections related to special investigations, site permittee inspections, and well permit applications. The Regulatory Compliance Team collected 3 water quality samples during routine permit inspections or from new well construction inspections. There were no formal enforcement actions initiated in FY 2022 that required special site visits.

FY 2022 Inspections/ Investigations/ Visits	
Exempt Well Inspections	0
Limited Production Permit Inspections	3
Individual Production Permit Inspections	2
Test Well Inspections	0
Plugging Inspections	1
Special Investigation Inspections	1
Other Permittee Meetings/Visits *	6
<i>*Multiple meetings were held with some permittees.</i>	
TOTAL	13

Provide a summary of the volume of aggregate groundwater withdrawals permitted and actually produced from permitted wells for each MZ and permit type in the Annual Report.

A summary of the actual versus permitted production volumes for each MZ is provided above in the Objective 1-2 Performance Standard update.

Objective 2-3. Provide leadership and technical assistance to government entities, organizations, and individuals affected by groundwater-utilizing land use activities, including support of or opposition to legislative initiatives or projects that are inconsistent with this objective.

Performance Standards

- A. In even-numbered fiscal years, provide a summary of interim legislative activity and related District efforts in the Annual Report. In odd-numbered fiscal years, provide a legislative debrief to the Board on bills of interest to the District, and provide a summary in the Annual Report.

During FY 2022, the Texas State Legislature did not meet.

- B. Provide a summary of District activity related to other land use activities affecting groundwater in the Annual Report.

Development Activities Over Recharge and Contributing Zones:

The District continues to monitor as many proposed/new developments as possible and Texas Pollutant Discharge Elimination System (TPDES) permits in the contributing and recharge zones of the Barton Springs segment of the Edwards Aquifer. Furthermore, the District continues to track legislation regarding wastewater discharges in the Edwards Aquifer Contributing Zone.

Texas Sunset Advisory Commission:

The Texas Commission on Environmental Quality (TCEQ) was one of the state agencies under sunset review during FY 2022, and District staff submitted a multi-point critique of the TCEQ's handling of wastewater permitting. The District's comments and recommendations were not included in the Advisory Commission's final report.

Objective 2-4. Ensure all firm-yield production permits are evaluated with consideration given to the demand-based permitting standards including verification of beneficial use that is commensurate with reasonable nonspeculative demand.

Performance Standard

A summary of the number and type of applications processed and approved for authorizations, permits, and permit amendments including approved use types and commensurate permit volumes for production permits and amendments will be provided in the Annual Report.

To ensure that all firm-yield production permits are evaluated with consideration given to the District's demand-based and nonspeculative permitting standards, staff completed comprehensive administrative and technical reviews of permit application requests. A summary of the number and type of applications processed and approved for authorizations, permits, and permit amendments including approved use types and commensurate permit volumes for production permits and amendments is provided below.

A summary of the [processed permitting applications](#) in FY 2022 is provided in the table below.

Processed Permit Applications	FY20	FY21	FY22
Minor Amendment	3	4	5
Major Amendments	0	0	0
New Exempt Well	2	9	11
Limited Production Permit (Nonexempt Domestic Wells)	9	15	10
Individual Production Permit	5	1	4
Individual Well Drilling Authorizations or Well Modification	2	1	0
Test Well	0	0	0
Well Plugging	6	5	9
Replacement Well	0	0	0
TOTAL	28	35	39

A summary of the [individual production permits](#) processed in FY 2022 is provided in the table below.

Annual Volume (gpy)	Production Permits Processed	Permit Type	Use Type	Aquifer
300,000	Confido, LLC	Class A Conditional	Commercial	Edwards
130,500	17050 S IH-35 Frontage Road, LLC	Class A Conditional	Commercial	Edwards
1,834,560	Goebler Properties, Inc.	Class A Conditional	Commercial	Edwards
943,500	Texas Legacy Masters, LLC	Historic	Commercial	Middle Trinity

GOAL 3 - ADDRESSING CONJUNCTIVE SURFACE WATER MANAGEMENT ISSUES

31 TAC 356.52(A)(1)(D)/TWC §36.1071(A)(4)

Objective 3-1. Assess the physical and institutional availability of existing regional surface water and alternative groundwater supplies, and the feasibility of those sources as viable supplemental or substitute supplies for District groundwater users.

Performance Standard

A summary of District activity related to this objective will be provided in the Annual Report.

Identify available alternative water resources and supplies that may facilitate source substitution and reduce demand on the Edwards Aquifer while increasing regional water supplies; and evaluate feasibility by considering available/proposed infrastructure, financial factors, logistical/engineering factors, and potential secondary impacts (development density/intensity or recharge water quality).

Staff worked cooperatively with the Ruby Ranch Water Supply Corporation (RRWSC) and their consultants to monitor water quality, water levels and water chemistry sampling and meter accounting of injection and extraction phases of their aquifer storage and recovery (ASR) operation (the 4th in Texas). The District also worked cooperatively with the TCEQ Underground Injection Control (UIC) Permits Section to assist in permit provisions. RRWSC is currently authorized to inject 15,000,000 and recover 12,300,000 gallons over a one-year period. In FY 2020, RRWSC was given a Conditional D permit for Edwards groundwater to inject into the Trinity Aquifer. In FY 2021, RRWSC began their first Conditional D permitted ASR recovery in September 2020 and from June-August 2021, with a total of 3,117,700 gallons recovered from Trinity formations. Water-quality data collected by RRWSC was shared with the District and evaluated by Aquifer Science staff.

https://bseacd.org/uploads/RubyRanchASR_Status-Report_FINAL.pdf

Objective 3-2. Encourage and assist District permittees to diversify their water supplies by assessing the feasibility of alternative water supplies and fostering arrangements with currently available alternative water suppliers.

Performance Standard

A summary of District activity related to this objective will be provided in the Annual Report.

Identify available alternative water resources and supplies that may facilitate source substitution and reduce demand on the Edwards Aquifer, while increasing regional water supplies; and evaluate feasibility by considering available/proposed infrastructure, financial factors, logistical/engineering factors, and potential secondary impacts (development density/intensity or recharge water quality).

Staff met with City of Buda staff and their consultant as they prepared a permit application for an ASR system. Staff participated in collecting cuttings and core samples from the ASR test well that Buda installed. In FY 2021, the District received an ASR Pilot Test Plan which was reviewed and found satisfactory by staff to prove the feasibility of the project.

In FY 2022, staff worked cooperatively with the City of Buda to collect data during ASR pilot testing initiated in late 2022. Aquifer Science staff will continue to work with Buda during pilot testing to ensure

adequate data is collected during the tests, including monitoring of water levels with the District's Antioch Westbay well to observe potential impacts during pumping from the Buda Trinity ASR well. The Buda ASR project is much larger scale than the RRWSC ASR project. Once pilot testing has been finished, subsequent evaluation of the Buda ASR testing data, along with data from the previous RRWSC ASR testing, will give the District a better understanding of the viability of the Middle Trinity Aquifer as an ASR target reservoir and help guide policymaking decisions for future proposed ASR projects.

Regulatory Compliance and Aquifer Science Teams had discussions with Bill Walters (Gragg Tract) on additional testing of the Lower Trinity Aquifer. Staff continues to assist with data collection and pump testing.

Objective 3-3. Demonstrate the importance of the relationship between surface water and groundwater, and the need for implementing prudent conjunctive use through educational programs with permittees and public outreach programs.

Performance Standards

Provide summaries of associated outreach and education programs, events, workshops, and meetings in the monthly team activity reports in the publicly-available Board backup.

This information has been presented in the monthly status report section of the Board backups. Visit <https://bseacd.org/transparency/agendas-backup/>, click on the Agenda hyperlink beneath the month of interest, the page number of the Status Report is listed under the General Manager (GM) Report section of the meeting agenda. Please see bulleted list in Objective 1-4 for a schedule of events and programs.

Summarized outreach activities and estimate reach is in the Annual Report.

Objective 3-4. Actively participate in the regional water planning process to provide input into policies, planning elements, and activities that affect the aquifers managed by the District.

Performance Standard

Regularly attend regional water planning group meetings, and annually report on meetings attended.

In FY 2022, staff attended meetings of the Lower Colorado Regional Water Planning Group and reported on any key updates at the Board Meetings. The GM and the alternate served as the Groundwater Management Area (GMA) 10 representatives through August 31, 2022 and continue to serve as liaisons. Meetings attended and their agendas are listed below.

JULY 27, 2022 - [Region+K+Meeting+Agenda+07-27-2022.pdf \(squarespace.com\)](#)

APRIL 27, 2022 - [2022-04-27 RegionK Meeting Agenda FINAL.pdf \(squarespace.com\)](#)

JANUARY 26, 2022 - [2022-01-26 Region K Meeting Agenda.pdf \(squarespace.com\)](#)

SEPTEMBER 15, 2021 - [2021_9_15 RWPG+Meeting++and+Public+Hearing+Agenda.pdf](#)

GOAL 4 - ADDRESSING NATURAL RESOURCE ISSUES WHICH IMPACT THE USE AND AVAILABILITY OF GROUNDWATER, AND WHICH ARE IMPACTED BY THE USE OF GROUNDWATER

31 TAC 356.52 (A)(1)(E)/TWC §36.1071(A)(5)

Objective 4-1. Assess ambient conditions in District aquifers on a recurring basis by (1) sampling and collecting groundwater data from selected wells and springs monthly, (2) conducting scientific investigations as indicated by new data and models to better determine groundwater availability for the District aquifers, and (3) conducting studies as warranted to help increase understanding of the aquifers and, to the extent feasible, detect possible threats to water quality and evaluate their consequences.

Performance Standards

Review water-level and water-quality data that are maintained by the District and/or TWDB, or other agencies, on a regular basis.

Staff visits approximately 44 monitor wells quarterly, in addition to numerous other wells throughout the year, including six multiport monitor wells. Data is collected and organized into individual spreadsheets and databases. Staff also regularly samples wells and springs for detailed geochemical analyses as a cooperator for the TWDB (13 sites in FY 2022). All data has been compiled in the TWDB database that is publicly available.

Improve existing analytical or numerical models or work with other organizations on analytical or numerical models that can be applied to the aquifers in the District.

Staff provided key technical support in the development of a conceptual model for the aquifers of the Blanco River watershed. That report (<https://bseacd.org/uploads/Martin-et-al.-2019-BRAAT.pdf>) was published at the end of FY 2019. Since then, staff have continued to work with the modeling team to provide technical guidance during ongoing model development and construction phase of the project.

Aquifer Science staff began development of an in-house numerical groundwater model (IHM) of the Trinity Aquifer in FY 2020. The IHM model domain covers parts of Travis, Hays, Blanco, and Comal counties. A steady-state version of the model was completed in late 2020. In FY 2021-2022, staff have worked to transition the model from steady-state to transient state. Transient models are substantially more complex than steady-state, and allow for simulation of the aquifer system under changing conditions such as prolonged drought and/or increases in localized or regional pumping. In FY 2022, preliminary transient model results were presented to the board to help guide discussion on the District's Trinity Sustainable Yield Project. A report summarizing these preliminary findings was produced and circulated to board and staff.

Once completed, the in-house model will provide a valuable tool which will allow policy makers and stakeholders to evaluate the potential impacts of management decisions on the Trinity Aquifer. In addition, development of the IHM will be a valuable training exercise for Aquifer Science staff, who will be better equipped to evaluate and interact with other groundwater models which are currently under development (such as the Blanco River Aquifer Assessment Tool and the new TWDB Hill Country Trinity Groundwater Availability Model).

No significant changes in water-quality data were observed during FY 2022. Aquifer conditions began with a status of No Drought thanks to a wet spring and summer 2021, narrowly keeping spring flow and aquifer levels from dipping below Stage II Alarm thresholds. However, below-average rainfall from winter 2021 through summer 2022 wasn't enough to keep levels from declining. By June 2022, Barton Springs and Lovelady crossed under their Stage II Alarm Drought thresholds and the Board declared a Stage II Alarm Drought on June 9, 2022.

Objective 4-2. Evaluate site-specific hydrogeologic data from applicable production permits to assess potential impact of withdrawals to groundwater quantity and quality, public health and welfare, contribution to waste, and unreasonable well interference.

Performance Standard

This involves evaluations of certain production permit applications for the potential to cause unreasonable impacts as defined by District rule. To evaluate the potential for unreasonable impacts, staff will (1) perform a technical evaluation of the application, aquifer test, and hydrogeological report; (2) use best available science and analytical tools to estimate amount of drawdown from pumping and influence on other water resources; and (3) recommend proposed permit conditions to the Board for avoiding unreasonable impacts if warranted.

The Aquifer Science staff continues to collect data in the southwestern portion of the District where the Trinity Aquifer is under the influence of significant nonexempt and exempt pumping. Continued monitoring of these and other locations will be critical for evaluating the Trinity Aquifer's response to pumping and drought within the District, and to what extent large pumping centers have the potential to cause unreasonable impacts. In FY 2022, staff completed drilling of two new dedicated monitoring wells in the vicinity of Jacob's Well Spring. One well is a dual-completion well and one well is a multiport well. A report summarizing data collected during drilling operations was produced and published by staff. The wells have been instrumented with water-level monitoring equipment and added to the District's monitoring well network. Going forward, data collected from these wells will improve our understanding of how recharge enters the Trinity Aquifer and travels downgradient into the confined, District portion of the aquifer, and provide a critical dataset for calibration of numerical models currently under construction.

- As indicated above, development of numerical models is underway to assist in the evaluations of potential unreasonable impacts from pumping from the large capacity wellfields and from other pumping and drought scenarios.
- The Aquifer Science staff continued data collection and analysis on the Trinity Aquifer to further expand the conceptual understanding of the Trinity groundwater system within. These data will be crucial for informing the District's ongoing efforts to develop a sustainable yield policy framework for managing the Trinity Aquifer.

Objective 4-3. Implement separate MZs and, as warranted, different management strategies to address more effectively the groundwater management needs for the various aquifers in the District.

Performance Standards

Increase the understanding of District aquifers by assessing aquifer conditions, logging wells, and collecting water quality data. A summary of the number of water quality samples performed will be provided in the Annual Report.

To increase the understanding of District aquifers and water level conditions, staff collects groundwater data from selected wells and performs field assessments such as logging wells and collecting water quality samples.

- The Aquifer Science Team collected 3 samples from sample sites including wells and springs from the Edwards and Trinity Aquifers for major ions and isotopes.
- The Regulatory Compliance Team collected 13 water quality samples during routine permit inspections or from new well construction inspections.

A summary of the volume of aggregate groundwater withdrawals permitted and actually produced from permitted wells for each MZ and permit type is provided in the Annual Report.

To ensure that all firm-yield production permits are evaluated with consideration given to the District’s demand-based and nonspeculative permitting standards, staff completed comprehensive administrative and technical reviews of permit application requests. A summary of the number and type of applications processed and approved for authorizations, permits, and permit amendments including approved use types and commensurate permit volumes for production permits and amendments is provided below.

A summary of the [processed permitting applications](#) in FY 2022 is provided in the table below.

Processed Permit Applications	FY20	FY21	FY22
Minor Amendment	3	4	5
Major Amendments	0	0	0
New Exempt Well	2	9	11
Limited Production Permit (Nonexempt Domestic Wells)	9	15	10
Individual Production Permit	5	1	4
Individual Well Drilling Authorizations or Well Modification	2	1	0
Test Well	0	0	0
Well Plugging	6	5	9
Replacement Well	0	0	0
TOTAL	48	26	35

A summary of the [individual production permits](#) processed in FY 2022 is provided in the table below.

Annual Volume (gpy)	Production Permits Processed	Permit Type	Use Type	Aquifer
300,000	Confido, LLC	Class A Conditional	Commercial	Edwards
130,500	17050 S IH-35 Frontage Road, LLC	Class A Conditional	Commercial	Edwards
1,834,560	Goebler Properties, Inc.	Class A Conditional	Commercial	Edwards
943,500	Texas Legacy Masters, LLC	Historic	Commercial	Middle Trinity

Objective 4-4. Actively participate in the joint planning processes for the relevant aquifers in the District to establish and refine desired future conditions (DFCs) that protect the aquifers and the Covered Species of the District Habitat Conservation Plan (HCP).

Performance Standard

Attend at least 75% of the GMA (groundwater management area) meetings, and annually report on meetings attended, GMA decisions on DFCs, and other relevant GMA business.

Staff attended 100% of the GMA 10 meetings that were held in FY 2022. The GMA discussions included the following topics:

- Annual review of individual GCD management plans.
- Discussions on possible revisions to the GMA 10 DFCs, as well as standardization of monitor well analysis and reporting occurred.
- Discussion of new planning cycle and expected Request for Qualifications for the next round of modeling and report writing.
- Submission of proposed DFCs and Explanatory Report.

Objective 4-5. Implement the measures of the Habitat Conservation Plan (HCP) and Incidental Take Permit (ITP) from the United States Fish and Wildlife Service (USFWS) for the Covered Species and covered activity to support the biological goals and objectives of the HCP.

Performance Standard

Prior to ITP permit issuance, a progress report summarizing activities related to the USFWS review of the ITP application will be provided in the Annual Report. Upon ITP issuance, the HCP annual report documenting the District's activities and compliance with ITP permit requirements will be incorporated into the Annual Report by reference.

The USFWS approved the District's HCP in July 2018, and published the Record of Decision and the final Environmental Impact Statement (EIS). On September 20, 2018, the USFWS issued a 20-year ITP. On April 11, 2019, the Board approved an Interlocal Agreement (ILA) between the District and the City of Austin (CoA) to collaborate and coordinate on routine and planned activities relative to each entity's respective HCP.

The District and the CoA meet annually to discuss their efforts, independent and joint, related to the HCP. The first annual meeting to discuss their respective HCP-related activities was held on December 10, 2019. The second annual meeting was held via Zoom during the pandemic on December 16, 2020. The third meeting was held on December 6, 2021.

On January 6, 2022, a meeting was held with the District HCP Management Advisory Committee (MAC) to discuss the District's HCP-related activities for FY 2021. On February 16, 2020, the third HCP Annual Report was submitted to the USFWS.

GOAL 5 - ADDRESSING DROUGHT CONDITIONS

31 TAC 356.52 (A)(1)(F)/TWC §36.1071(A)(6)

Objective 5-1. Adopt and keep updated a science-based drought trigger methodology, and frequently monitor drought stages on the basis of actual aquifer conditions, and declare drought conditions as determined by analyzing data from the District’s defined drought triggers and from existing and such other new drought-declaration factors, especially the prevailing dissolved oxygen (DO) concentration trends at the spring outlets, as warranted.

Performance Standards

During periods of District-declared drought, prepare a drought chart at least monthly to report the stage of drought and the conditions that indicate that stage of drought. During periods of nondrought, prepare the drought charts at least once every three months.

Staff monitored the District’s two drought trigger sites (the Barton Springs and Lovelady monitor wells) plus numerous other indicators of drought conditions relating to the Edwards Aquifer. The District contracts with the United States Geological Survey (USGS) for the Lovelady Well to maintain equipment, collect, and host as real-time data on their website. The CoA contracts with the USGS to maintain the data for Barton Springs.

Staff frequently verified water-level values measured by the equipment at the Lovelady monitor well (which has recorded data since 1949) and verified discharge measurements made at Barton Springs. During periods of District-declared drought, and preceding potential drought, staff provided timely updated reports of aquifer conditions at each board meeting. Data from Trinity monitor wells were also collected and evaluated at these times.

In 2018, staff evaluated the current drought trigger methodology as it relates to the Middle Trinity Aquifer. Results were published in a memo and found that the District’s established Edwards Aquifer triggers are indeed representative of drought conditions, regardless of the aquifer. In FY 2022, staff continued to monitor Trinity Aquifer water-level drops in response to the ongoing drought and evaluate whether the established Edwards drought triggers are still representative of Trinity Aquifer conditions. To date, the established triggers appear to be adequate. Staff will continue to evaluate Trinity Aquifer water levels as drought conditions persist. If Trinity Aquifer behavior deviates significantly from the Edwards, a reevaluation of established drought triggers may be warranted.

A summary of the drought indicator conditions and any declared drought stages and duration will be provided in the Annual Report.

Objective 5-2. Implement a drought management program that step-wise curtails freshwater Edwards Aquifer use to at least 50% by volume of 2014 authorized aggregate monthly use during Extreme Drought, and that designs/uses other programs that provide an incentive for additional curtailments where possible. For all other aquifers, implement a drought management program that requires mandatory monthly pumpage curtailments during District-declared drought stages.

Performance Standard

During District-declared drought, enforce compliance with drought management rules to achieve overall monthly pumpage curtailments within 10% of the aggregate curtailment goal of the prevailing drought stage. A monthly drought compliance report for all individual permittees will be provided to the Board during District-declared drought, and a summary will be included in the Annual Report.

The District implements a drought management program that requires mandatory monthly pumpage curtailments during District-declared drought stages. The District was in Alarm Drought status from June 9, 2022 – October 14, 2022 and provided the Board with a monthly compliance spreadsheet that showed which permittees were under or over curtailment targets. The District was in No Drought stage September 1, 2021 – June 8, 2022.

Objective 5-3. Inform and educate permittees and other well owners about the significance of declared drought stages and the severity of drought, and encourage practices and behaviors that reduce water use by a stage-appropriate amount.

Performance Standards

During District-declared drought, publicize declared drought stages and associated demand reduction targets in monthly eNews bulletins and continuously on the District website.

The District went into Stage II Alarm Drought on June 9, 2022. Drought stages are publicized through press releases, eNews bulletins, and continuously on the District’s website. The home page of the website has the District’s drought trigger levels prominently displayed. There is a small banner at the very top of the page showing the current drought status. However, there is a much larger banner on the upper half of the page, also showing the current drought status. The drought status is shared under highlights on the home page of the website, on the newsroom page, and the press release page when there is a change to the drought status. Prior to alarm drought status, the District shared the Water Conservation Period information.

Included below are The Aquifer Zone Newsletters for FY 2022. There is a drought update in every newsletter.

The Aquifer Zone – Fall 2021 - <https://bit.ly/3WGzHAi>
The Aquifer Zone – Winter 2022 - <https://bit.ly/3qYrn17>
The Aquifer Zone – Spring 2022 - <https://bit.ly/3OfkCBT>
The Aquifer Zone – Summer 2022 - <https://bit.ly/3om196u>

A summary of drought and water conservation related newsletter articles, press releases, and drought updates sent to Press, Permittees, Well Owners and eNews subscribers will be provided in the Annual Report.

Articles included:

- The Aquifer Zone – Fall 2021 Newsletter: Drought and Aquifer Status Update, BSEACD Weather Station, Buda ASR Pilot Test Permit, How BSEACD Protects Groundwater, Science in 60 Seconds: Downhole Video Cameras. What is pH?, Turbidity, Water Conductivity
Link to newsletter: <https://bit.ly/3WGzHAi>
- The Aquifer Zone – Winter 2022 Newsletter: Message From General Manager, Drought and Aquifer Status Update, Edwards Aquifer Signs, How Recharge Works, How to Check the District’s Drought Status, Science in 60 Seconds: Streamflow Measurement, Aquatic Science Adventure Camp

Scholarship Essay/Art Contest, 2022 Kent S. Butler Groundwater Stewardship Scholarship Essay Contest

Link to newsletter: <https://bit.ly/3qYrn17>

- The Aquifer Zone – Spring 2022 Newsletter: Message From General Manager, Drought and Aquifer Status Update, Water Conservation Period, Drought Status for Area Municipalities, New Director Precinct Boundaries, Multiport Monitor Well Installation, Dye Tracing Study, Aquatic Science Adventure Camp Scholarship Essay/Art Contest, 2022 Kent S. Butler Groundwater Stewardship Scholarship Essay Contest.

Link to newsletter: <https://bit.ly/3OfkCBT>

- The Aquifer Zone – Summer 2022 Newsletter: Message From General Manager, Drought Update, Alarm Drought (Stage II), Community Meeting on Drought, Drought Statuses for Area Municipalities, Residential Limited Production Permitted Wells – Meter Readings, Monitor Well Installation, Kent Butler Scholarship Winners

Link to newsletter: <https://bit.ly/3om196u>

Press Releases included:

- BSEACD Board Appoints Interim Director for Precinct 3 – November 22, 2021
<https://bseacd.org/uploads/BSEACD-Board-Appoints-Interim-Director-for-Precinct-3-Unexpired-Term-1-1.pdf>
- 2022 Aquatic Science Adventure Camp Application and Rules – December 29, 2021
<https://bseacd.org/uploads/Aquatic-Science-Adventure-Camp-Application-Form-with-Texas-State-Flyer-FINAL.pdf>
- BSEACD Board of Directors Names Tim Loftus General Manager – January 20, 2022
<https://bseacd.org/uploads/BSEACD-Board-of-Directors-Names-Tim-Loftus-General-Manager.pdf>
- 2022 Water Well Checkup – February 9, 2022
<https://bseacd.org/uploads/2022-Well-Water-Checkup.pdf>
- Board of Directors Adopts New Director Precinct Boundaries – March 16, 2022
<https://bseacd.org/uploads/District-Board-of-Directors-Adopts-New-Director-Precinct-Boundaries.pdf>
- BSEACD Awards Aquatic Science Adventure Camp Scholarships – April 18, 2022
<https://bseacd.org/uploads/BSEACD-Awards-Aquatic-Science-Adventure-Camp-Scholarships-.pdf>
- Regulatory Compliance Specialist Opening – June 7, 2022
<https://bseacd.org/uploads/Regulatory-Compliance-Specialist-Position.pdf>
- Aquifer District Declares Stage II Alarm Drought – June 9, 2022
<https://bseacd.org/uploads/Aquifer-District-Declares-Stage-II-Alarm-Drought.pdf>
- BSEACD Awards Kent S. Butler Memorial Groundwater Stewardship Scholarships – June 10, 2022
<https://bseacd.org/uploads/BSEACD-Awards-Kent-S.-Butler-Memorial-Groundwater-Stewardship-Scholarships-.pdf>
- Community Meeting on Drought-Related Topics – July 15, 2022
<https://bseacd.org/uploads/Community-Meeting-On-Drought-Related-Topics.pdf>

Social Media: Communications and Outreach Team shares videos, educational information, scholarship information, drought-related news, and other groundwater-related topics on the District's various social media channels. The posts are included in the social media reports below.

September 2021 - <https://bseacd.org/uploads/BSEACD-Social-Media-Roundup-September-2021.pdf>

October 2021 - <https://bseacd.org/uploads/BSEACD-Social-Media-Roundup-October-2021.pdf>

November 2021 - <https://bseacd.org/uploads/BSEACD-Social-Media-Roundup-November-2021.pdf>

December 2021 - <https://bseacd.org/uploads/BSEACD-Social-Media-Roundup-December-2021.pdf>

January 2022 - <https://bseacd.org/uploads/BSEACD-Social-Media-Roundup-January-2022.pdf>

February 2022 - <https://bseacd.org/uploads/BSEACD-Social-Media-Roundup-February-2022.pdf>

March 2022 - <https://bseacd.org/uploads/BSEACD-Social-Media-Roundup-March-2022.pdf>

April 2022 - <https://bseacd.org/uploads/BSEACD-Social-Media-Roundup-April-2022.pdf>

May 2022 - <https://bseacd.org/uploads/BSEACD-Social-Media-Roundup-May-2022.pdf>

June 2022 - <https://bseacd.org/uploads/BSEACD-Social-Media-Roundup-June-2022.pdf>

July 2022 - <https://bseacd.org/uploads/BSEACD-Social-Media-Roundup-July-2022.pdf>

August 2022 - <https://bseacd.org/uploads/BSEACD-Social-Media-Roundup-August-2022.pdf>

The District's YouTube channel provides information on drought and groundwater-related information. Videos in FY 2022 included:

District YouTube channel: <https://www.youtube.com/channel/UCqiQlZ7y708Ar0yPB2Yd4Cg>.

Drought Update – August 17, 2022

<https://www.youtube.com/watch?v=WGiQ4-aAIWs&t=5s>

Community Meeting – August 6, 2022

<https://www.youtube.com/watch?v=ybwewZIdMYI&t=199s>

Slug Testing Video Explainer

<https://www.youtube.com/watch?v=93JRkFneiSg&t=2s>

Perspective on the Current Drought – July 27, 2022

<https://www.youtube.com/watch?v=bTFhaKvB-ns>

Drought Update/Well Monitoring – July 26, 2022

<https://www.youtube.com/watch?v=HpLznZZ7QYE&t=4s>

Aquifer District Declares Stage II Alarm Drought

<https://www.youtube.com/watch?v=wJ5KiCpog2c&t=78s>

Multiport Monitor Well – Water Sample Collection

<https://www.youtube.com/watch?v=hhoZBmt2bas>

Monitor Well Installation Part 2

<https://www.youtube.com/watch?v=54xpKKo0ipg&t=107s>

Happy Teacher's Day – May 3, 2022

<https://www.youtube.com/watch?v=Kvp-wOY6pOE>

Administrative Professionals Day – April 27, 2022

<https://www.youtube.com/watch?v=Q8yCIJ8PjZU>

Well Inspection – Regulatory Compliance Team

<https://www.youtube.com/watch?v=IU-YoOIq8ZE&t=36s>

Aquatic Science Adventure Camp Scholarship Winners
<https://www.youtube.com/watch?v=GOf7PzfZzOU&t=64s>

Multiport Monitor Well Installation
<https://www.youtube.com/watch?v=yDQw4H1ZahY&t=6s>

Dye Tracing Study
<https://www.youtube.com/watch?v=TZ-S7kRT7oM&t=69s>

National Groundwater Awareness Week
<https://www.youtube.com/watch?v=28psb6Rvox8>

2022 Well Water Check Up – Sampling Instructions
<https://www.youtube.com/watch?v=wpHxfqvAT6o&t=1s>

The Aquifer Zone Newsletter – January 2022
<https://www.youtube.com/watch?v=c8xjNhiQOfk>

What is Aquifer Testing?
<https://www.youtube.com/watch?v=k6-0V2GfMUY&t=1s>

2022 Kent S. Butler Scholarship Groundwater Essay Contest
<https://www.youtube.com/watch?v=jNNujM27VBo>

Martin Luther King Jr. Day
<https://www.youtube.com/watch?v=5O2jwrKMZBE>

Drought Update – January 14, 2022
https://www.youtube.com/watch?v=4us_MGXWY3c&t=1s

Jacobs Well – Throwback Thursday
<https://www.youtube.com/watch?v=wurjRyWnJp4&t=1s>

Edwards Aquifer Recharge
<https://www.youtube.com/watch?v=ZOKph1R-0EY&t=18s>

Edwards Aquifer Signs – Why Should You Care?
<https://www.youtube.com/watch?v=NL04fyqGelo>

How to Check the District’s Drought Status
<https://www.youtube.com/watch?v=7aU4mBFfKgM>

Do I live in the District?
<https://www.youtube.com/watch?v=jQ0XN4AhRgM&t=1s>

Drought Update – November 18, 2021
<https://www.youtube.com/watch?v=ciBfVUoKZJU&t=33s>

Streamflow Measurement: Raw Video
https://www.youtube.com/watch?v=i_J3xFOWWTE&t=1s

Science in 60 Seconds: Streamflow Measurement
<https://www.youtube.com/watch?v=QgI6WVSo9kg&t=2s>

Happy November

<https://www.youtube.com/watch?v=SJgaTDloSuU>

Throwback Thursday – What is dye tracing?

<https://www.youtube.com/watch?v=zRSfztjW1Qo>

The Aquifer Zone Newsletter – Fall 2021

<https://www.youtube.com/watch?v=JrzmyDyIg8>

Onion Creek at Twin Creeks Road – October 14, 2021

<https://www.youtube.com/watch?v=MLiG0QmuZ-g>

Slaughter Creek at Manchaca – October 14, 2021

<https://www.youtube.com/watch?v=OOmAsA3OFM4>

National Fossil Day – October 13, 2021

<https://www.youtube.com/watch?v=5PKJe9hkECI>

Science in 60 Seconds: Downhole Video Cameras

<https://www.youtube.com/watch?v=SELZvhmLhlo>

Trinity Downhole Camera

<https://www.youtube.com/watch?v=LNNBMSOs0Jk>

New BSEACD Instagram Channel

https://www.youtube.com/watch?v=wGSF_aGBmfg

Collect Rocks Day – September 16, 2021

<https://www.youtube.com/watch?v=xbDimo1buwM>

Science in 60 Seconds: Water Conductivity

<https://www.youtube.com/watch?v=ul3iPXVpZ2o>

Aquifer Status Update – September 9, 2021

<https://www.youtube.com/watch?v=nHAMyrU7th4>

Protect Your Groundwater Day – September 7, 2021

<https://www.youtube.com/watch?v=ojqVHSz5exM&t=54s>

BSEACD Weather Station

https://www.youtube.com/watch?v=7y_vlAvWs0s&t=1s

Objective 5-4. Assist and, where feasible, incentivize individual freshwater Edwards Aquifer historic-production permittees in developing drought planning strategies to comply with drought rules, including (1) pumping curtailments by drought stage to at least 50% of the 2014 authorized use during Extreme Drought, (2) “right-sizing” authorized use over the long term to reconcile actual water demands and permitted levels, and (3) as necessary and with appropriate conditions, source substitution with alternative supplies.

Performance Standards

Require an updated User Conservation Plan and User Drought Contingency Plan (UCP/UDCP) from Permittees within one year of each five-year MP Adoption.

In FY 2019, the Regulatory Compliance Team worked with interns to update 136 permit records in order to incorporate updated drought planning documents into their records. According to the District MP, all permittees must update their UDCP and UCP plans at least every five years. Therefore, since all UDCPs were updated in FY 2019, staff did not update them in FY 2022.

Provide a summary of any activity related to permit right sizing or source substitution with alternative supplies that may reduce demand on the freshwater Edwards Aquifer in the Annual Report.

After notice and an opportunity for a hearing, the Board may renew a permit with a reduced amount of the authorized production if the authorized withdrawal volume is no longer commensurate with reasonable nonspeculative demand, or actual production from a well is substantially less than the authorized permit amount for multiple years without any rationale that reasonably relates to efforts to utilize alternative water supplies, conserve, or improve water use efficiency. Staff typically conducts an overpumpage analysis every few years, and conducted the analysis in FY 2019, therefore staff did not conduct an overpumpage analysis in FY 2022.

The District has been actively encouraging alternative source projects to reduce the dependency on the aquifers during drought. Staff has collaborated with water suppliers on ASR projects in providing regulatory and technical guidance. Staff has been working with the City of Buda on ASR feasibility. The Ruby Ranch ASR project was approved and has been in operation since the summer of FY 2021. Staff also assisted in assessing the feasibility of Lower Trinity Aquifer for water supply.

Objective 5-5. Implement a Conservation Permit that is held by the District and accumulates and preserves withdrawals from the freshwater Edwards Aquifer that were previously authorized with historic-use status and that is retired or otherwise additionally curtailed during severe drought, for use as ecological flow at Barton Springs during Extreme Drought and thereby increase springflow for a given set of hydrologic conditions.

Performance Standard

A summary of the volume of aggregate groundwater withdrawals permitted and actually produced from permitted wells for each MZ and permit type including the volume reserved in the freshwater Edwards Conservation Permit for ecological flows will be provided in the Annual Report.

A summary of the actual versus permitted production volumes for each MZ is provided in Objective 1-2. The amount of historical Edwards Aquifer permitted water that has been retired since 2009 is 82,025,125 gallons per year that can be targeted for a conservation permit. Additionally, 1,200,000 gallons per year of Historical Trinity Aquifer permitted water has been retired; no Conditional A permitted water has been retired.

GOAL 6 - Addressing Conservation and Rainwater Harvesting where Appropriate and Cost-Effective

31TAC 356.52 (a)(1)(G)/TWC §36.1071(a)(7)

Objective 6-1. Develop and maintain programs that inform, educate, and support District permittees in their efforts to educate their end-user customers about water conservation and its benefits, and about drought-period temporary demand reduction measures.

Performance Standards

A summary of efforts to assist permittees in developing drought and conservation messaging strategies will be provided in the Annual Report.

Each permittee is required to have an approved User Drought Contingency Plan (UDCP) that outlines conservation actions to be taken under each drought stage. Staff provides bill inserts and road signs to all permittees upon request in drought declaration to help them comply with messaging requirements set forth in the UDCP. Staff actively promotes aquifer status through eNews, press releases, the District website, and social media platforms. Permittees are encouraged to share this information with their end users. Examples of bill inserts and handouts:

- Flyer - https://bseacd.org/uploads/Critical_Poster18x24-1.pdf
- Mail Inserts - https://bseacd.org/uploads/Critical_drought_bill_insert.pdf
- Drought Handout - <https://bseacd.org/uploads/All-About-Drought-1.pdf>
- District Brochure - <https://bseacd.org/uploads/Pamphlet-FINAL.pdf>

In FY 2022 Alarm Drought (Stage II) Signage was put out throughout Permittee areas of the District. Included below are the areas where signs were put up:

FM 1626 – 10 signs (Austin)

FM 150 (including Rollingwood Neighborhood) – 7 signs

Wildwood Neighborhood (Austin) – 3 Signs

Hays Hills Baptist Church – 3 signs

PGMS – 7 signs

City of Mountain City – 4 signs

Sunfield Neighborhood in Buda – 4 signs

St. Mark's Episcopal Church – 3 signs

Buda/Kyle Church of Christ – 3 signs

Byron Townsend 3 signs

Byron covers Cimarron Park, Slaughter Creek Acres, and Village San Leanna

San Marcos

Ranch Road – 12 signs

Hilliard Area – 10 signs

Publicize declared drought stages and associated demand reduction targets monthly in eNews bulletins and continuously on the District website.

In FY 2022, the Water Well Checkup Program resumed for permittees. The District teamed up with Texas A&M Agrilife Extension and Texas Well Owner Network to provide Water Well Checkups for District well owners. The cost of the water analysis was covered by the District for the first fifty well owners to pick up a water kit. The samples were taken to Luling for analysis. Results were physically mailed to well owners and emailed. Over twenty-five permittees took part in the program.

The District was in Stage II Alarm Drought from June 9, 2022, through October 19, 2022. Prior to the District declaring Alarm Drought, the regular Water Conservation Period, which extends from May through September, was shared on the District's website social media channels, and through eNews.

Drought status updates are shared across all District social media channels (Twitter, YouTube, Facebook, Instagram, Nextdoor). The Lovelady and Barton Springs levels are shared a few times a month on the District's social media channels and website to let permittees and the general audience know how high or low the levels are going, and also when the District may cross into the next drought stage.

In addition, drought status information has been shared in a new monthly drought report sent out to permittees/subscribers through eNews. The report is then shared on the District's social media channels and website.

Conservation education webpages were updated regularly with new resources, and shared on District social media platforms. Free educational handouts, well owner education, and information on well analysis is provided on the District website and has been shared on social media. There are also hard copies in the office.

See Objective 5-3 for a summarized list of Articles, Press Releases, Drought Reports, Social Media Reports, and Videos.

Objective 6-2. Encourage use of conservation-oriented rate structures by water utility permittees to discourage egregious water demand by individual end-users during declared drought.

Performance Standard

On an annual basis, the District will provide an informational resource or reference document to all public water supply permittees to serve as resources related to conservation best management strategies and conservation-oriented rate structures.

The District is part of the CTWEN and sponsors the annual Water Conservation Symposium. Permittees are encouraged to attend. The symposium provides water utilities with the information needed to implement successful water conservation programs, effectively engage customers, and plan for the future. This program provides conservation-oriented strategies (including conservation-oriented rate structures) for mayors, city councils, board members of Municipal Utility Districts (MUDs), Regional Water Authorities, City Managers, Water Utility directors and staff, water conservation managers, program staff and other relevant staff, CFOs, finance directors, sustainability directors, business and community leaders, consultants, and advocates.

Objective 6-3. Develop and maintain programs that educate and inform District groundwater users and constituents of all ages about water conservation practices and the use of alternate water sources such as rainwater harvesting, gray water, and condensate reuse.

Performance Standard

Summarize water conservation related newsletter articles, press releases, and events in the Annual Report. Summary will describe the preparation and dissemination of materials shared with District groundwater users and area residents that inform them about water conservation and alternate water sources.

The District sponsors and supports a number of events promoting water conservation and alternate water sources such as the Central Texas Water Conservation Symposium, Austin Cave Festival, Well Water Check-Up, LBJ Wildflower Center (LBJWFC) Nature Nights Rocks-Water-Mud, City of Buda Trash-Off, City of Sunset Valley Public Works Open House, Explorers Guide to the Hill Country Oasis, and Groundwater to the Gulf: A Summer Institute for Educators. Conservation education webpages were updated regularly with new resources, and shared on District social media platforms. The District also created a District Newsroom website page with all news/conservation/drought related information.

See Objective 5-3 for a list of summarized Articles and Press Releases.

GOAL 7 - ADDRESSING RECHARGE ENHANCEMENT WHERE APPROPRIATE AND COST-EFFECTIVE

31TAC 356.52 (A)(1)(G)/TWC §36.1071(A)(7)

Objective 7-1. Improve recharge to the freshwater Edwards Aquifer by conducting studies and, as feasible and allowed by law, physically altering (cleaning, enlarging, protecting, diverting surface water) discrete recharge features that will lead to an increase in recharge and water in storage beyond what otherwise would exist naturally.

Performance Standard

Maintaining the functionality of the Antioch system will be the principal method for enhancing recharge to the freshwater Edwards Aquifer. Additional activities may be excavating sinkholes and caves within the District. A summary of all recharge improvement activities will be provided in the Annual Report.

Antioch Cave is a recharge feature on District property that is capable of contributing a significant amount of water to the Edwards Aquifer when Onion Creek is flowing. A vault constructed over the cave entrance, and automated valves allow for clean creek water to enter the cave, and contaminated stormwater to be kept out. This system was maintained by staff in FY 2022 so that the amount of clean creek water entering the cave was maximized. A regular reporting item has been added to the GM Report special topics list to provide a monthly oral update on these and other Aquifer Science activities, and satisfies this reporting requirement.

Operational equipment and hardware at Antioch Cave to improve the operation and performance of the BMP are fully functional and in good performance. Equipment is collecting water-quality readings every 15 minutes and reporting to an organized database via telemetry.

Objective 7-2. Conduct technical investigations and, as feasible, assist water-supply providers in implementing engineered enhancements to regional supply strategies, including desalination, ASR, effluent reclamation and re-use, and recharge enhancement of surface water (including floodwater) to increase the options for water-supply substitution and reduce dependence on the Aquifer.

Performance Standard

Assess progress toward enhancing regional water supplies.

In FY 2022, the District worked with other entities in the area, such as the City of Buda and RRWSC, to evaluate the potential for the Trinity Aquifers as reservoirs for ASR facilities. See above section: Objective 3-2 for a brief summary of staff's work with Buda WSC on their ASR pilot testing program.

https://bseacd.org/uploads/RubyRanchASR_Status-Report_FINAL.pdf

GOAL 8 - ADDRESSING THE DESIRED FUTURE CONDITIONS OF THE GROUNDWATER RESOURCES

31TAC (A)(1)(H)/TWC §36.1071(A)(8)

Objective 8-1. Freshwater Edwards Aquifer All-Conditions DFC: Adopt rules that restrict, to the greatest extent practicable, the total amount of groundwater authorized to be withdrawn annually from the Aquifer to an amount that will not substantially accelerate the onset of drought conditions in the Aquifer; this is established as a running seven-year average springflow at Barton Springs of no less than 49.7 cfs during average recharge conditions.

Performance Standards

- A. A summary of the volume of aggregate groundwater withdrawals permitted and actually produced from permitted wells for each MZ and permit type will be provided in the Annual Report.

A summary of the actual versus permitted production volumes for each MZ is provided in Objective 1-2.

- B. Upon ITP issuance, the HCP annual report documenting the District's activities and compliance with ITP permit requirements will be incorporated into the Annual Report by reference.

The USFWS issued the District's ITP in September 2018. The District submitted its third annual report to USFWS on February 16, 2022.

- C. Upon ITP issuance, compile a summary of aquifer data including: 1) the frequency and duration of District-declared drought, 2) levels of the Aquifer as measured by springflow and indicator wells (including temporal and spatial variations), and 3) total annual and daily discharge from Barton Springs will be provided in the Annual Report.

FY 2022 began with a No Drought status and remained that way until June 9, 2022 when the Board declared Stage II Alarm drought, effective July 1, 2022. The fiscal year ended in Stage II Alarm drought status.

Discharge at Barton Springs was 66.9 cfs on September 1, 2021 and 28.1 cfs on August 31, 2022. The depth to water level (feet below land surface) at the Lovelady monitoring well began the fiscal year at 163.49 feet and ended the fiscal year at 187.73, a decline of 24.24 feet.

Objective 8-2. Freshwater Edwards Aquifer Extreme Drought DFC: Adopt rules that restrict, to the greatest extent practicable and as legally possible, the total amount of groundwater withdrawn monthly from the aquifer during Extreme Drought conditions in order to minimize take and avoid jeopardy of the Covered Species as a result of the Covered Activities, as established by the best science available. This is established as a limitation on actual withdrawals from the aquifer to a total of no more than 5.2 cfs on an average annual (curtailed) basis during Extreme Drought, which will produce a minimum springflow of not less than 6.5 cfs during a recurrence of the drought of record (DOR).

Performance Standards

- A. A summary of the volume of aggregate groundwater withdrawals permitted and actually produced from permitted wells for each MZ and permit type will be provided in the Annual Report.

A summary of the actual versus permitted production volumes for each MZ is provided above in Objective 1-2.

- B. Upon ITP issuance, the HCP annual report documenting the District’s activities and compliance with ITP permit requirements, will be incorporated into the Annual Report by reference.

The USFWS issued the District’s ITP in September 2018. The District submitted its third annual report to USFWS on February 16, 2022.

- C. Upon ITP issuance, compile a summary of aquifer data including: 1) the frequency and duration of District-declared drought, 2) levels of the Aquifer as measured by springflow and indicator wells (including temporal and spatial variations), and 3) total annual and daily discharge from Barton Springs will be provided in the Annual Report.

Please see Objective 8-1 above.

Objective 8-3. Implement appropriate rules and measures to ensure compliance with District-adopted DFCs for each relevant aquifer or aquifer subdivision in the District.

Performance Standard

Develop and implement a cost-effective method for evaluating and demonstrating compliance with the DFCs of the relevant aquifers in the District, in collaboration with other GCDs in the GMAs. Prior to method implementation, provide a summary of activities related to method development in the Annual Report. Once developed, provide a summary of data for each District-adopted DFC for each relevant aquifer indicating aquifer conditions relative to the DFC, and provide in the Annual Report.

For the Trinity Aquifer in GMA 10, to determine compliance with the Trinity Aquifer DFC, the data must show that the average regional well drawdown does not exceed 25 feet during average recharge conditions including exempt and nonexempt use. GMA 10 is without a means to monitor “average regional drawdown across the planning area. The District made progress in FY 2022 with an in-house numerical model that will help to inform drawdown (within the District) under a variety of conditions. One such scenario is pumping in response to the extant network of Trinity wells in combination with a drought-of-record. Results are expected in early FY 2023.

As reported last year, the average daily springflow at Barton Springs over the time period of September 1, 2014 to August 31, 2021 was 77 cfs. For the fiscal year 2022 just ended and the seven years beginning September 1, 2015, the average daily springflow declined 2 cfs to 75 cfs. Precipitation during the seven years ending August 31, 2021 was greater in Hays and Travis counties than during the seven years ending August 31, 2022. Which of the two seven-year periods best reflects average recharge conditions is uncertain without considerably more data analysis.

The DFC expression is:

“Springflow at Barton Springs during average recharge conditions shall be no less than 49.7 cfs averaged over an 84-month (7-year) period; and during extreme drought conditions including those as severe as a recurrence of the 1950’s drought of record, springflow at Barton Springs shall be no less than 6.5 cfs average on a monthly basis.”

For the Saline Edwards, Northern Subdivision, the DFC expression is no more than 75 feet of regional average potentiometric surface drawdown due to pumping when compared to pre-development conditions. Currently, there are no approved permits in the Saline Edwards.

For a summary of aquifer conditions, see Objective 8-1 above.

Performance Standards and Objectives

General Management (9 objectives)	Administration (3 objectives)	Education & Outreach (6 objectives)	Aquifer Science (8 objectives)	Regulatory Compliance (7 objectives)
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GOAL 1 - Providing the Most Efficient Use of Groundwater – 31 TAC 356.52(a)(1)(A)/TWC §36.1071(a)(1)

	Management Plan Objectives	Performance Standards
1-1	Provide and maintain on an ongoing basis a sound statutory, regulatory, financial, and policy framework for continued District operations and programmatic needs.	<p>A. Develop, implement, and revise as necessary, the District Management Plan in accordance with state law and requirements. Each year, the Board will evaluate progress towards satisfying the District goals. A summary of the Board evaluation and any updates or revisions to the management plan will be provided in the <u>annual report</u>.</p> <p>B. Review and modify District Rules as warranted to provide and maintain a sound statutory basis for continued District operations and to ensure consistency with both District authority and programmatic needs. A summary of any rule amendments adopted in the previous fiscal year will be included in the <u>annual report</u>.</p>
1-2	Monitor aggregated use of various types of water wells in the District, as feasible and appropriate, to assess overall groundwater use and trends on a continuing basis.	Monitor annual withdrawals from all nonexempt wells through required monthly or annual meter reports to ensure that groundwater is used as efficiently as possible for beneficial use. A summary of the volume of aggregate groundwater withdrawals permitted and actually produced from permitted wells for each Management Zone and permit type will be provided in the <u>annual report</u> .
1-3	Evaluate quantitatively at least every five years the amount of groundwater withdrawn by exempt wells in the District to ensure an accurate accounting of total withdrawals in a water budget that includes both regulated and nonregulated withdrawals, so that appropriate groundwater management actions are taken.	<p>A. Provide an estimate of groundwater withdrawn by exempt wells in the District using TDLR and TWDB databases and District well records, and update the estimate every five years with the District’s management plan updates.</p> <p>B. In the interim years between management plan updates, the most current estimates of exempt well withdrawals will be included in a summary of the volume of aggregate groundwater withdrawals permitted and actually produced from permitted wells for each Management Zone and permit type that will be provided in the <u>annual report</u>.</p>
1-4	Develop and maintain programs that inform and educate citizens of all ages about groundwater and springflow-related matters, which affect both water supplies and salamander ecology.	<p>A. Publicize District drought trigger status (Barton Springs 10-day average discharge and Lovelady Monitor Well water level) in monthly eNews bulletins and continuously on the District website.</p> <p>B. Provide summaries of associated outreach and education programs, events, workshops, and meetings in the monthly team activity reports in the publicly-available Board backup.</p> <p>C. A summary of outreach activities and estimated reach will be provided in the <u>annual report</u>.</p>

1-5	Ensure responsible and effective management of District finances such that the District has the near-term and long-term financial means to support its mission.	<p>A. Receive a clean financial audit each year. A copy of the auditor’s report will be included in the annual report.</p> <p>B. Timely develop and approve fiscal-year budgets and amendments. The dates for public hearings and Board approval of the budget and any amendments will be provided in the annual report.</p>
1-6	Provide efficient administrative support and infrastructure, such that District operations are executed reliably and accurately, meet staff and local stakeholder needs, and conform to District policies and with federal and state requirements.	<p>A. Maintain, retain, and control all District records in accordance with the Texas State Library and Archives Commission-approved District Records Retention Schedule to allow for safekeeping and efficient retrieval of any and all records, and annually audit records for effective management of use, maintenance, retention, preservation and disposal of the records’ life cycle as required by the Local Government Code. A summary of records requests received under the PIA, any training provided to staff or directors, or any claims of violation of the Public Information Act will be provided in the <u>annual report</u>.</p> <p>B. Develop, post, and distribute District Board agendas, meeting materials, and backup documentation in a timely and required manner; post select documents on the District website, and maintain official records, files, and minutes of Board meetings appropriately. A summary of training provided to staff or directors or any claims of violation of the Open Meetings Act will be provided in the <u>annual report</u>.</p>
1-7	Manage and coordinate electoral process for Board members.	Ensure elections process is conducted and documented in accordance with applicable requirements and timelines. Elections documents will be maintained on file and a summary of elections-related dates and activities will be provided in the <u>annual report</u> for years when elections occur.

GOAL 2 - Controlling and Preventing Waste of Groundwater – 31 TAC 356.52(a)(1)(B)/TWC §36.1071(a)(2))

	Management Plan Objectives	Performance Standards
2-1	Require all newly drilled exempt and nonexempt wells, and all plugged wells to be registered and to comply with applicable District Rules, including Well Construction Standards.	A summary of the number and type of applications processed and approved for authorizations, permits, and permit amendments including approved use types and commensurate permit volumes for production permits and amendments will be provided in the <u>annual report</u> .
2-2	Ensure permitted wells and well systems are operated as intended by requiring reporting of periodic meter readings, making periodic inspections of wells, and reviewing pumpage compliance at regular intervals that are meaningful with respect to the existing aquifer conditions.	A. Inspect all new wells for compliance with the Rules, and Well Construction Standards, and provide a summary of the number and type of inspections or investigations in the <u>annual report</u> . B. Provide a summary of the volume of aggregate groundwater withdrawals permitted and actually produced from permitted wells for each Management Zone and permit type in the <u>annual report</u> .
2-3	Provide leadership and technical assistance to government entities, organizations, and individuals affected by groundwater-utilizing land use activities, including support of or opposition to legislative initiatives or projects that are inconsistent with this objective.	A. In even-numbered fiscal years, provide a summary of interim legislative activity and related District efforts in the <u>annual report</u> . In odd-numbered fiscal years, provide a legislative debrief to the Board on bills of interest to the District and provide a summary in the annual report. B. Provide a summary of District activity related to other land use activities affecting groundwater in the <u>annual report</u> .
2-4	Ensure all firm-yield production permits are evaluated with consideration given to the demand-based permitting standards including verification of beneficial use that is commensurate with reasonable non-speculative demand.	A summary of the number and type of applications processed and approved for authorizations, permits, and permit amendments including approved use types and commensurate permit volumes for production permits and amendments will be provided in the <u>annual report</u> .

GOAL 3 - Addressing Conjunctive Surface Water Management Issues – 31 TAC 356.52(a)(1)(D)/TWC §36.1071(a)(4)

	Management Plan Objectives	Performance Standards
3-1	Assess the physical and institutional availability of existing regional surface water and alternative groundwater supplies and the feasibility of those sources as viable supplemental or substitute supplies for District groundwater users.	Identify available alternative water resources and supplies that may facilitate source substitution and reduce demand on the Edwards Aquifer, while increasing regional water supplies, and evaluate feasibility by considering: <ol style="list-style-type: none"> 1. available/proposed infrastructure, 2. financial factors, 3. logistical/engineering factors, and 4. potential secondary impacts (development density/intensity or recharge water quality). A summary of District activity related to this objective will be provided in the <u>annual report</u> .
3-2	Encourage and assist District permittees to diversify their water supplies by assessing the feasibility of alternative water supplies and fostering arrangements with currently available alternative water suppliers.	Identify available alternative water resources and supplies that may facilitate source substitution and reduce demand on the Edwards Aquifer, while increasing regional water supplies, and evaluate feasibility by considering: <ol style="list-style-type: none"> 1. available/proposed infrastructure, 2. financial factors, 3. logistical/engineering factors, and 4. potential secondary impacts (development density/intensity or recharge water quality). A summary of District activity related to this objective will be provided in the <u>annual report</u> .
3-3	Demonstrate the importance of the relationship between surface water and groundwater, and the need for implementing prudent conjunctive use through educational programs with permittees and public outreach programs.	A. Provide summaries of associated outreach and education programs, events, workshops, and meetings in the monthly team activity reports in the publicly-available Board backup. B. Summarize outreach activities and estimate reach in the <u>annual report</u> .
3-4	Actively participate in the regional water planning process to provide input into policies, planning elements, and activities that affect the aquifers managed by the District.	Regularly attend regional water planning group meetings and <u>annually report</u> on meetings attended.

GOAL 4 - Addressing Natural Resource Issues which Impact the Use and Availability of Groundwater, and which are Impacted by the Use of Groundwater – 31 TAC 356.52 (a)(1)(E)/TWC §36.1071(a)(5)

	Management Plan Objectives	Performance Standards
4-1	<p>Assess ambient conditions in District aquifers on a recurring basis by:</p> <ol style="list-style-type: none"> 1. sampling and collecting groundwater data from selected wells and springs monthly; 2. conducting scientific investigations as indicated by new data and models to better determine groundwater availability for the District aquifers; and 3. conducting studies as warranted to help increase understanding of the aquifers and, to the extent feasible, detect possible threats to water quality and evaluate their consequences. 	<ol style="list-style-type: none"> A. Review water-level and water-quality data that are maintained by the District and/or TWDB, or other agencies, on a regular basis. B. Improve existing analytical or numerical models or work with other organizations on analytical or numerical models that can be applied to the aquifers in the District. C. A review of the data mentioned above will be assessed for significant changes and reported in the <u>annual report</u>.
4-2	<p>Evaluate site-specific hydrogeologic data from applicable production permits to assess potential impact of withdrawals to groundwater quantity and quality, public health and welfare, contribution to waste, and unreasonable well interference.</p>	<p>This involves evaluations of certain production permit applications for the potential to cause unreasonable impacts as defined by District rule. To evaluate the potential for unreasonable impacts, staff will:</p> <ol style="list-style-type: none"> A. Perform a technical evaluation of the application, aquifer test, and hydrogeological report; B. Use best available science and analytical tools to estimate amount of drawdown from pumping and influence on other water resources; and C. Recommend proposed permit conditions to the Board for avoiding unreasonable impacts if warranted. <p>A list of permit applications that are determined to have potential for unreasonable impacts will be provided in the <u>annual report</u>.</p>
4-3	<p>Implement separate management zones and, as warranted, different management strategies to address more effectively the groundwater management needs for the various aquifers in the District.</p>	<ol style="list-style-type: none"> A. Increase the understanding of District aquifers by assessing aquifer conditions, logging wells, and collecting water quality data. A summary of the number of water quality samples performed will be provided in the <u>annual report</u>. B. A summary of the volume of aggregate groundwater withdrawals permitted and actually produced from permitted wells for each Management Zone and permit type will be provided in the <u>annual report</u>.

4-4	Actively participate in the joint planning processes for the relevant aquifers in the District to establish and refine Desired Future Conditions (DFCs) that protect the aquifers and the Covered Species of the District HCP.	Attend at least 75% of the GMA meetings and annually report on meetings attended, GMA decisions on DFCs, and other relevant GMA business.
4-5	Implement the measures of the District Habitat Conservation Plan (HCP) and Incidental Take Permit (ITP) from the U.S. Fish & Wildlife Service (USFWS) for the covered species and covered activity to support the biological goals and objectives of the HCP.	Prior to ITP permit issuance, a progress report summarizing activities related to the USFWS review of the ITP application will be provided in the <u>annual report</u> . Upon ITP issuance, the <u>HCP annual report</u> documenting the District's activities and compliance with ITP permit requirements will be incorporated into the <u>annual report</u> by reference.

GOAL 5 - Addressing Drought Conditions – 31 TAC 356.52 (a)(1)(F)/TWC §36.1071(a)(6)

	Management Plan Objectives	Performance Standards
5-1	Adopt and keep updated a science-based drought trigger methodology, and frequently monitor drought stages on the basis of actual aquifer conditions, and declare drought conditions as determined by analyzing data from the District’s defined drought triggers and from existing and such other new drought-declaration factors, especially the prevailing DO concentration trends at the spring outlets, as warranted.	<p>A. During periods of District-declared drought, prepare a drought chart at least monthly to report the stage of drought and the conditions that indicate that stage of drought. During periods of non-drought, prepare the drought charts at least once every three months.</p> <p>B. A summary of the drought indicator conditions and any declared drought stages and duration will be provided in the <u>annual report</u>.</p>
5-2	Implement a drought management program that step-wise curtails freshwater Edwards Aquifer use to at least 50% by volume of 2014 authorized aggregate monthly use during Extreme Drought, and that designs/uses other programs that provide an incentive for additional curtailments where possible. For all other aquifers, implement a drought management program that requires mandatory monthly pumpage curtailments during District-declared drought stages.	During District-declared drought, enforce compliance with drought management rules to achieve overall monthly pumpage curtailments within 10% of the aggregate curtailment goal of the prevailing drought stage. A monthly drought compliance report for all individual permittees will be provided to the Board during District-declared drought, and a summary will be included in the <u>annual report</u> .
5-3	Inform and educate permittees and other well owners about the significance of declared drought stages and the severity of drought, and encourage practices and behaviors that reduce water use by a stage-appropriate amount.	<p>A. During District-declared drought, publicize declared drought stages and associated demand reduction targets in monthly eNews bulletins and continuously on the District website.</p> <p>B. A summary of drought and water conservation related newsletter articles, press releases, and drought updates sent to Press, Permittees, Well Owners and eNews subscribers will be provided in the <u>annual report</u>.</p>

5-4	<p>Assist and, where feasible, incentivize individual freshwater Edwards Aquifer historic-production permittees in developing drought planning strategies to comply with drought rules, including:</p> <ol style="list-style-type: none"> 1. pumping curtailments by drought stage to at least 50% of the 2014 authorized use during Extreme Drought, 2. “right-sizing” authorized use over the long term to reconcile actual water demands and permitted levels, and 3. as necessary and with appropriate conditions, the source substitution with alternative supplies. 	<ol style="list-style-type: none"> A. Require an updated UCP/UDCP from Permittees within one year of each five-year Management Plan Adoption. B. Provide a summary of any activity related to permit right sizing or source substitution with alternative supplies that may reduce demand on the freshwater Edwards Aquifer in the <u>annual report</u>.
5-5	<p>Implement a Conservation Permit that is held by the District and accumulates and preserves withdrawals from the freshwater Edwards Aquifer that were previously authorized with historic-use status and that is retired or otherwise additionally curtailed during severe drought, for use as ecological flow at Barton Springs during Extreme Drought and thereby increase springflow for a given set of hydrologic conditions.</p>	<p>A summary of the volume of aggregate groundwater withdrawals permitted and actually produced from permitted wells for each Management Zone and permit type including the volume reserved in the freshwater Edwards Conservation Permit for ecological flows will be provided in the <u>annual report</u>.</p>

**GOAL 6 - Addressing Conservation and Rainwater Harvesting where Appropriate and Cost-Effective – 31TAC 356.52
(a)(1)(G)/TWC §36.1071(a)(7)**

	Management Plan Objectives	Performance Standards
6-1	Develop and maintain programs that inform, educate, and support District permittees in their efforts to educate their end-user customers about water conservation and its benefits, and about drought-period temporary demand reduction measures.	<p>A. A summary of efforts to assist permittees in developing drought and conservation messaging strategies will be provided in <u>annual report</u>.</p> <p>B. Publicize declared drought stages and associated demand reduction targets monthly in eNews bulletins and continuously on the District website.</p>
6-2	Encourage use of conservation-oriented rate structures by water utility permittees to discourage egregious water demand by individual end-users during declared drought.	<u>On an annual basis</u> , the District will provide an informational resource or reference document to all Public Water Supply permittees to serve as resources related to conservation best management strategies and conservation-oriented rate structures.
6-3	Develop and maintain programs that educate and inform District groundwater users and constituents of all ages about water conservation practices and the use of alternate water sources such as rainwater harvesting, gray water, and condensate reuse.	Summarize water conservation related newsletter articles, press releases, and events in the <u>annual report</u> . Summary will describe the preparation and dissemination of materials shared with District groundwater users and area residents that inform them about water conservation and alternate water sources.

GOAL 7 - Addressing Recharge Enhancement where Appropriate and Cost-Effective – 31TAC 356.52 (a)(1)(G)/TWC §36.1071(a)(7)

	Management Plan Objectives	Performance Standards
7-1	<p>Improve recharge to the freshwater Edwards Aquifer by conducting studies and, as feasible and allowed by law, physically altering (cleaning, enlarging, protecting, diverting surface water to) discrete recharge features that will lead to an increase in recharge and water in storage beyond what otherwise would exist naturally.</p>	<p>Maintaining the functionality of the Antioch system will be the principal method for enhancing recharge to the freshwater Edwards Aquifer. Additional activities may be excavating sinkholes and caves within the District. A summary of all recharge improvement activities will be provided in the <u>annual report</u>.</p>
7-2	<p>Conduct technical investigations and, as feasible, assist water-supply providers in implementing engineered enhancements to regional supply strategies, including desalination, aquifer storage and recovery, effluent reclamation and re-use, and recharge enhancement of surface water (including floodwater) to increase the options for water-supply substitution and reduce dependence on the Aquifer.</p>	<p>Assess progress toward enhancing regional water supplies in the <u>annual report</u>.</p>

GOAL 8 - Addressing the Desired Future Conditions of the Groundwater Resources – 31TAC (a)(1)(H)/TWC §36.1071(a)(8)

	Management Plan Objectives	Performance Standards
8-1	<p>Freshwater Edwards Aquifer All-Conditions DFC: Adopt rules that restrict, to the greatest extent practicable, the total amount of groundwater authorized to be withdrawn annually from the Aquifer to an amount that will not substantially accelerate the onset of drought conditions in the Aquifer; this is established as a running seven-year average springflow at Barton Springs of no less than 49.7 cfs during average recharge conditions.</p>	<p>A. A summary of the volume of aggregate groundwater withdrawals permitted and actually produced from permitted wells for each Management Zone and permit type will be provided in the <u>annual report</u>.</p> <p>B. Upon ITP issuance, the <u>HCP annual report</u> documenting the District’s activities and compliance with ITP permit requirements will be incorporated into the <u>annual report</u> by reference.</p> <p>C. Upon ITP issuance, compile a summary of aquifer data including: 1) the frequency and duration of District-declared drought, 2) levels of the Aquifer as measured by springflow and indicator wells (including temporal and spatial variations), and 3) total annual and daily discharge from Barton Springs will be provided in the <u>annual report</u>.</p>

<p>8-2</p>	<p>Freshwater Edwards Aquifer Extreme Drought DFC: Adopt rules that restrict, to the greatest extent practicable and as legally possible, the total amount of groundwater withdrawn monthly from the Aquifer during Extreme Drought conditions in order to minimize take and avoid jeopardy of the Covered Species as a result of the Covered Activities, as established by the best science available. This is established as a limitation on actual withdrawals from the Aquifer to a total of no more than 5.2 cfs on an average annual (curtailed) basis during Extreme Drought, which will produce a minimum springflow of not less than 6.5 cfs during a recurrence of the drought of record (DOR).</p>	<ul style="list-style-type: none"> A. A summary of the volume of aggregate groundwater withdrawals permitted and actually produced from permitted wells for each Management Zone and permit type will be provided in the <u>annual report</u>. B. Upon ITP issuance, the <u>HCP annual report</u> documenting the District’s activities and compliance with ITP permit requirements will be incorporated into the <u>annual report</u> by reference. C. Upon ITP issuance, compile a summary of aquifer data including: 1) the frequency and duration of District-declared drought, 2) levels of the Aquifer as measured by springflow and indicator wells (including temporal and spatial variations), and 3) total annual and daily discharge from Barton Springs will be provided in the <u>annual report</u>.
<p>8-3</p>	<p>Implement appropriate rules and measures to ensure compliance with District-adopted DFCs for each relevant aquifer or aquifer subdivision in the District.</p>	<p>Develop and implement a cost-effective method for evaluating and demonstrating compliance with the DFCs of the relevant aquifers in the District, in collaboration with other GCDs in the GMAs. Prior to method implementation, provide a summary of activities related to method development in the <u>annual report</u>. Once developed, provide a summary of data for each District-adopted DFC for each relevant aquifer indicating aquifer conditions relative to the DFC and provide in the <u>annual report</u>.</p>

Appendix D

Meeting Minutes of Management Advisory Committee (2/1/23)

**Barton Springs/Edwards Aquifer Conservation District
Management Advisory Committee Meeting and Comments Summary
HCP Annual Report Review Meeting**

February 1, 2023, 3-4 pm via Zoom

Management Advisory Committee (MAC) members present at commencement: Blake Neffendorf (City of Buda), Elizabeth Bates (USFWS), Susan Meckel (LCRA), Clifton Ladd, Nathan Bendik (City of Austin), Scott Nester, Brian Hunt, Vicky Kennedy (Travis County), Dr. Ben Hutchins (Texas State University), Jennifer Walker (NWF), and Dr. Jack Sharp (UT-Austin). Staff present included: Dr. Tim Loftus, Dr. Brian Smith, Justin Camp, Jeff Watson, David Marino, Erin Swanson, Alyssa Gilbert, and Kendall Bell-Enders. These minutes represent a summarized version of the meeting and feedback/comments from the MAC (provided verbally during the meeting and through email).

Note: Section 6 of the Habitat Conservation Plan (HCP) details the roles of the plan participants, and includes, in Section 6.5.1.2, the development of a District HCP Management Advisory Committee (MAC) to advise and assist in the coordination of conservation activities affecting Covered Species at Barton Springs, and to monitor the implementation of the District HCP, both for the District and for the USFWS, as an additional measure of ensuring continued implementation of the HCP and compliance with the ITP.

Meeting Overview

Brian Smith led the meeting with a MS-PowerPoint presentation. He presented some tables and figures from the draft HCP Annual Report showing changes in permitted and actual pumping since 1993. He also described how the requirements for the District's HCP follow very closely with the District's Management Plan. Justin Camp gave an update on aquifer conditions and discussed a table showing salamander take for FY 2022. Brian Smith mentioned that comments from the MAC are due by February 6 so that the HCP Annual Report can be presented to the Board at their February 9 meeting. The final HCP Annual Report is due to USFWS by the end of February.

Comments and Feedback – Q&A

MAC members provided feedback verbally during the meeting and Dr. Sharp and Dr. Hutchins submitted written feedback via email. The following is a summary of all MAC comments and questions. The questions were answered during the meeting.

- What is the status of the well plugging and abandoned well program?
- Can abandoned wells be converted into monitor wells?
- What is the status of the Zilker Park monitor well program?
- Question about how the District relates the contributing zone to the Edwards Aquifer.
- Why is there an increase in irrigation from 10% in 2020 to 18% in 2022?
- Is it possible to verify the salamander take numbers?
- How is over pumping by permittees handled?
- Request for more description of database project. Description was added to the Annual Report in Section 15.0.
- Request for definitions of the different types of wells described in the Annual Report. Definitions were added to Section 1.2.
- Comment made that the MAC needs more time to review the draft annual report and to comment prior to the February 9 Board meeting.