Appendix A

Description of District's Validation Monitoring Protocol

Barton Springs
Edwards Aquifer
CONSERVATION DISTRICT

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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 # TE10607C-0

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,

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 synopsized 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 non-springflow 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, non-springflow-related District activities (like well construction *per se*),and add the springflow and non-springflow 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:

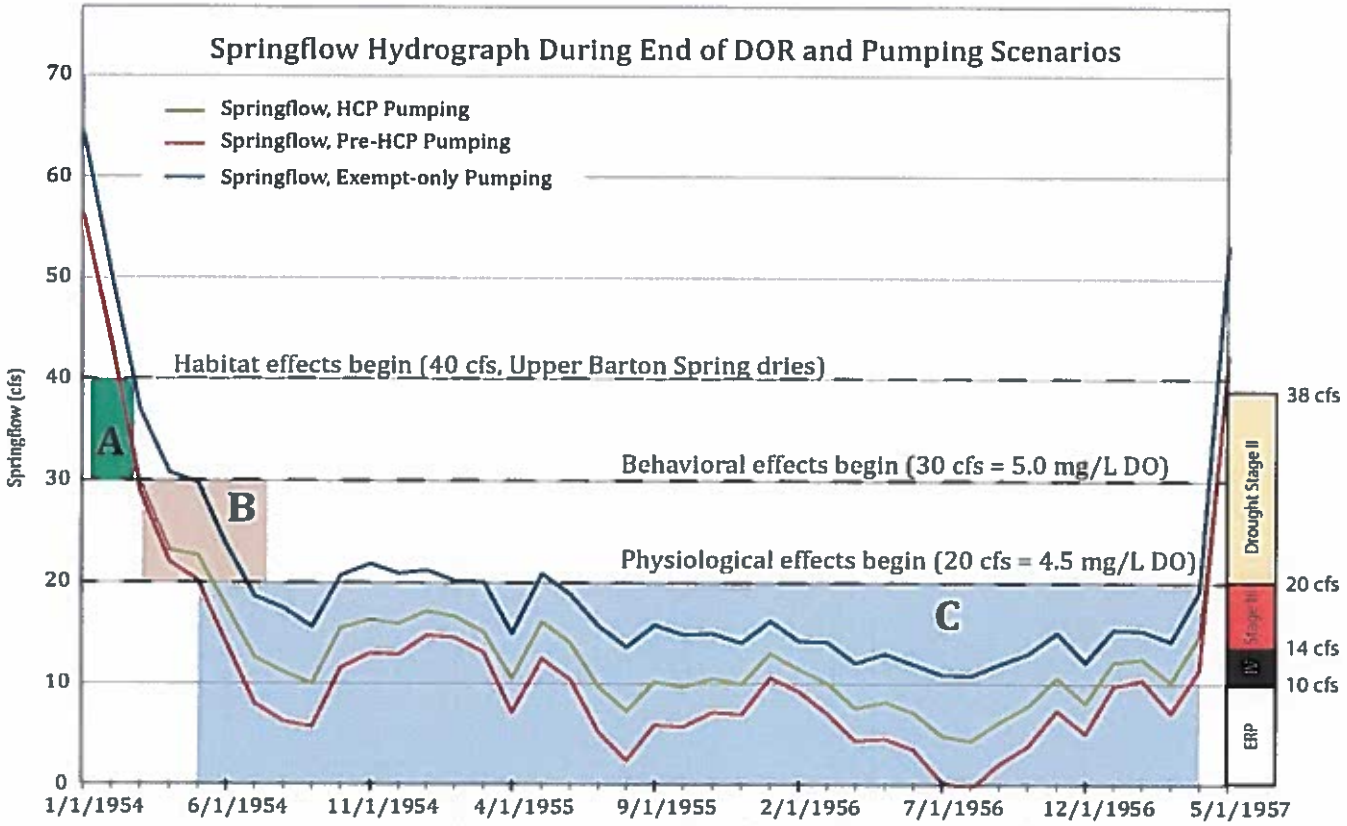
Take Type	Take Category	Inclusive Dates	No. of Months*	BSS Take Factor	Estimated BSS Take	ABS Take Factor	Estimated ABS Take
Springflow-Related	A #1	TBD-TBD	2.25	-	15	0	0
	A #2	TBD-TBD	0.60		15	0	0
	B	TBD-TBD; TBD-TBD	6.45	174	1122	36.6	236
	C	TBD-TBD	2.45	174	426	36.6	90
Occasional, Other	-	MM/DD/YYYY	N/A	N/A	1	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 take factor was developed to estimate potential monthly take each time springflows is 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 Factor (monthly below 30 cfs)
		A	B	C			
		Upper BS	Behavioral Effects	Physiological Effects			
BSS	4988	15	4988	29% x 4998 = 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 Barton Spring experiences mostly sub-lethal take because pumping hastens drying of habitat.

B: Springflow ≤30 cfs (≤ 5.0 mg/L DO): Up to 100% of the stipulated population potentially experiences take because decreased DO from pumping causes adverse behavioral effects that are mostly sub-lethal during these two months.

C: Springflow ≤20 cfs (≤ 4.5mg/L DO): Up to 29% of stipulated population potentially experiences take because decreased DO from pumping contributes to the adverse physiological effects ranging from sub-lethal to lethal as the depth and duration of drought increases. 29% derived from ratio of average permitted pumping to average total discharge over the 35months (4.8 cfs/16.7 cfs = 29%). Note: average DO at Main Springs 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

LAW DEPARTMENT

MEMORANDUM

TO: Rey Arellano, Assistant City Manager

FROM: Chad Shaw, Assistant City Attorney

DATE: May 7, 2019

SUBJECT: Interlocal Agreement with the Barton Springs Edwards Aquifer Conservation District

Attached for your signature please find two copies of an interlocal agreement between the Barton Springs Edwards Aquifer Conservation District (BSEACD) and the City. This agreement authorizes the parties to coordinate management activities for the protection of the Barton Springs and Austin blind salamander species. These activities are obligations set out in the City's permit from the U.S. Fish and Wildlife Service (USFWS) allowing for the operation and maintenance of Barton Springs.

Council authorized the negotiation and execution of this agreement as Item 88 on their August 7, 2014, agenda. The lengthy delay between authorization and execution was necessary because USFWS only recently approved BSEACD's related habitat conservation plan. Authorized representatives of BSEACD have already signed the agreement.

I have reviewed this agreement, and you are legally authorized to execute this agreement. Please do not hesitate to contact me at extension 42671 if you have any questions.

Please contact Andrew Boone at extension 42848 when the signed documents are ready to be picked up.

INTERLOCAL AGREEMENT BETWEEN
THE BARTON SPRINGS EDWARDS AQUIFER CONSERVATION DISTRICT
AND THE CITY OF AUSTIN

This Interlocal Agreement ("Agreement") is made by and between the Barton Springs Edwards Aquifer Conservation District, a political subdivision of the State of Texas acting by and through its duly elected Board of Directors or designee ("the District") and the City of Austin, Texas, a home-rule municipality and political subdivision of the State of Texas acting by and through its duly authorized City Manager or designee ("the City").

WITNESSETH:

WHEREAS, the Barton Springs segment of the Edwards Aquifer ("the Aquifer") provides drinking water to more than 60,000 Central Texans and withdrawal of most groundwater from the Aquifer is regulated by the District; and

WHEREAS, Barton Springs (the Springs) is owned and managed by the City and is a recreational and cultural asset to the City visited by more than 700,000 people annually, and

WHEREAS, the Barton Springs Complex, herein considered to be the individual outlets of Parthenia (Main) Spring, Eliza Spring, Old Mill (Sunken Garden) Spring, and Upper Barton Spring, in aggregate, is the primary natural discharge point of the Aquifer and both the Springs and the Aquifer provide habitat for the endangered Barton Springs salamander and endangered Austin blind salamander (together, the Covered Species); and

WHEREAS, goals of the City's Watershed Protection Department (WPD) are to maintain or enhance the existing rate of recharge to the Aquifer and to maintain or enhance critical environmental features like Barton Springs; and

WHEREAS, the District is committed to conserving, protecting, enhancing recharge, and preventing waste of groundwater and to preserving all aquifers within the District; and

WHEREAS, a conservation measure of the City's Habitat Conservation Plan for the Operation and Maintenance of Barton Springs and Adjacent Springs requires the expeditious development of a cooperative agreement with the District to formalize collaborative efforts to protect endangered endemic *Eurycea* salamanders and the Aquifer; and

WHEREAS, the conservation measures of the District's Habitat Conservation Plan for groundwater withdrawals by permitted well owners and management of the Barton Springs segment of the Edwards Aquifer require the development of an Inter-local Agreement with the City to formalize collaborative efforts and provide data and analyses important to protection of those endangered species;

WHEREAS, the WPD has been authorized by the City Council and designated by the City Manager to negotiate and execute this Agreement; and

WHEREAS, the City and District have already been successfully collaborating on a range of efforts to protect the quality and quantity of the Aquifer and the Springs on an *ad-hoc* basis:

NOW, THEREFORE, the **District** and the **City** agree to collaborate and coordinate on routine and planned communication, public education, flow/aquifer level measurement, monitoring, regional issues, recharge enhancement, and groundwater pumping matters and to make other related commitments, as follows.

I. Routine and Planned Communication and Public Education

A. The City and the District will meet annually to discuss the status of on-going or planned projects under the respective Habitat Conservation Plans of the City and District and other initiatives that may affect the quality or quantity of groundwater in the Aquifer or that may affect the current status and dynamics associated with the Covered Species and their stewardship.

B. In the spring of even numbered years, the City and the District will consider participation and joint collaboration to support a conference, designated the Kent Butler Summit, to serve as a forum for discussion and sharing of information related to issues affecting the Aquifer and the Covered Species.

C. In the summer of odd-numbered years, the City and the District will collaborate in organizing and hosting an informal technical meeting with other groups and individuals that are conducting studies related to the Barton Springs segment of the Edwards Aquifer. Interested parties will be encouraged to give presentations summarizing their studies.

D. The City and the District will coordinate and collaborate on public education and outreach efforts relating to water quality and quantity preservation of the Aquifer and the endangered species that use the Aquifer as habitat.

E. The City will provide to the District no later than January 31st of each year a copy of the City's scientific research permit (TE833851) report to the U.S. Fish and Wildlife Service ("the Service") as well as any reports and analyses produced by the City during the prior year that pertain to the following:

- Results of surveys of the Covered Species conducted by the City. These may be used to help evaluate responses to groundwater management actions during any low Aquifer water-level and low-flow conditions (herein, less than 30 cfs combined springflow at the Springs);
- Evaluations of Covered-Species habitat during various low-flow conditions,
- Analyses of relative salamander abundance and population characteristics based on observations during low-flow and other conditions
- Water-chemistry characteristics related to flow within the Aquifer and through the spring orifices during normal and low-flow conditions,

The City will also provide digital copies of these data upon request.

F. The City will provide to the District no later than January 31st of each year a copy of the annual report to the U.S. Fish and Wildlife Service ("the Service") for the City's Incidental Take Permit (TE 839031-1) for the operation and maintenance of Barton Springs, or as soon thereafter as made available by the City to the Service.

G. The District will provide to the City no later than the ensuing December 1st after this Agreement is effective and of each year thereafter:

- Reports on aggregate actual groundwater production by permittees by use type for the previous fiscal year and on any estimate of exempt use made by the District for that year,

and if and as requested by the City, supporting and illustrative data and analyses produced during the previous year;

- A summary review of modeling of the Aquifer and of Aquifer water balance modeling, if any, produced during the previous year.
- Laboratory reports or summary spreadsheets of water quality data collected by the District at the Springs during the previous year, and if and as requested by the City, laboratory reports or summary water quality data for sampled springs, wells, or surface sites in the Aquifer area.

H. The District will provide to the City no later than March 15th of each year a copy of the District's Annual Report to the Service for the District's Incidental Take Permit (TE 10607C-0) for Groundwater Use and Management of the Aquifer, or as soon thereafter as made available by the District to the Service.

II. Spring Flow/Aquifer Level Measurement

A. The City will continue to fund the measurement of spring discharge by the United States Geological Survey ("USGS") at Barton Springs (USGS Station 08155500) and real-time telemetry reporting of gage-height and spring dissolved oxygen to the USGS website.

B. The District will continue to fund the measurement and telemetry of water levels in the Lovelady monitor and drought stage indicator well (USGS Station 301237097464801), or some other index well, and real-time telemetry reporting of its water-level data.

C. The City, when Barton Springs combined discharge is estimated to be less than 40 cubic feet per second (cfs) according to the USGS gage at the Springs, will make manual discharge measurements of main Barton Springs, Eliza Spring and Old Mill Spring and of total Barton Springs complex springflow from all outlets at least monthly, and when the discharge is estimated to be 22 cfs or below, twice per month; in both circumstances, the City will share the manual discharge measurements with the District within one week of the measurement date.

D. The District, when Barton Springs combined discharge approaches a drought stage threshold (38 cfs, 20 cfs, 14 cfs, and 10 cfs), as estimated by the corresponding water-level elevations at the USGS gage at the Lovelady monitor and drought-indicator well, will make manual discharge measurements of total springflow of Barton Springs as needed to confirm Barton Springs flow for assessing drought stage status and prognosis, and share the manual discharge measurements with the City within one week of the measurement date.

E. The City and the District will collaborate to improve the accuracy of measurement of combined total discharge from the Barton Springs Complex where feasible. The District and the City will notify the USGS when the gage's reported instantaneous spring flow values differ from the manual measurements made by either party by 20%.

F. The City will consider the District's input into the evaluation of the preliminary engineering feasibility review, design and installation of new flow measurement equipment or construction of an improved flow measurement structure or structures to more accurately measure total discharge from the Barton Springs Complex if the City pursues capital projects to improve spring flow measurement.

G. The City and the District will coordinate on joint flow loss studies in the recharge zone. Such collaboration may involve District contributions of in-kind support or District Board of Directors (Board)-approved and budgeted financial support.

III. Monitoring

A. The City will request permission of, receive authorization from, and coordinate with the District on all City-conducted dye tracing activities of the Aquifer, including documenting shared roles and responsibilities, as applicable.

B. The District will notify the City of dye tracing activities within the Aquifer. The City and the District will determine, in advance of the dye trace and as applicable, which entity will be responsible for sampling designated wells and springs for the term of the trace and document responsibilities in a written plan for each trace.

C. The City will continue Barton Springs salamander and Austin blind salamander surveys, including both routine quarterly surveys and any exception-based surveys, pursuant to the City's federal permits TE 833851 and TE 839031.

D. The City will continue water quality monitoring of the Barton Springs Complex pursuant to the most current version of the City's Texas Pollutant Discharge Elimination System Municipal Separate Storm Sewer System permit and associated Stormwater Management Plan and provide copies of the annual permit report to the District for routine monitoring, and, if and as conducted, any exception-based monitoring. This continued monitoring by the City specifically includes enabling the continuous monitoring of dissolved oxygen at Barton Springs.

E. The City will facilitate District access to the Barton Springs complex for non-biological sampling. The City will determine if the proposed District sampling activity will be consistent with the City's ITP requirements.

F. The City and the District will collaboratively define and evaluate options and assess feasibility, and, if determined feasible, the District will emplace several new subsurface monitors by converting existing and/or installing new wells, including but not limited to:
    - One of the prospective Magellan Longhorn Pipeline monitor wells in the Garrison Park-Amur Street area for multiple use as a sentinel and groundwater/habitat monitoring well;
    - Existing open-hole wells in the recharge zone remote from Zilker Park for conversion to secure habitat monitoring well(s) that allow both groundwater and biological sampling;
    - One or more new multi-port wells in the Edwards/Upper(most) Glen Rose in or near Zilker Park;
    - One or more new open-hole Habitat Monitoring Wells, nearby the new multi-port well in Zilker Park, for periodic or episodic groundwater and biological sampling

G. The City will assess the efficacy of reallocating funds currently used in some or all of its existing groundwater data collection program with the USGS throughout the Barton Springs Zone, herein to include the contributing, recharge, and confined zones of the Aquifer, to provide additional resources for collaborative efforts under this Agreement, including but not limited to installing new "hybrid" wells used for both groundwater and habitat monitoring, periodic sampling of such wells, and analyzing water quality and habitat data from them. .

H. The City will facilitate District access to important existing and future District monitor wells, to include but not be limited to:
    - Lovelady Drought Index well-- assist District and USGS staff with periodic access to the monitor well, if needed;
    - Longhorn Pipeline Monitor Wells—one or more wells to be installed in the Garrison Park-Amur Street area;
    - Ruby Ranch Monitor Well - a multiport well on City property at Ruby Ranch;

- DO Augmentation Wells – mitigation measures, if feasible, in the vicinity of the Barton Springs outlets, as described in subsection VII.A below; and
- Any other groundwater or habitat monitoring wells to be used by the District and/or City that currently exist on City property or that may be installed in the future on City property with the City's concurrence. Such wells may be for groundwater-level monitoring, groundwater chemistry sampling, and/or for habitat characteristics, as described in subsection VII.D below.

IV. Regional Cooperation

A. The City and the District agree to continue to organize and participate in meetings of the Barton Springs Zone Regional Water Quality Protection Plan working group.
B. The City and the District agree to continue to share information and coordinate on studies related to Texas Department of Transportation projects over the Aquifer.
C. The City and the District agree to continue to share information and coordinate actions in response to Texas Commission on Environmental Quality wastewater disposal permit actions within the contributing or recharge zones of the Aquifer.
D. The City and the District agree to continue to share information and coordinate actions in response to proposed State of Texas legislation that may affect the Aquifer.
E. The City has documented its support for service of a District board member or staff person on the City's Environmental Commission in City Code Section 2-1-144 (*Environmental Commission*).
F. The City will add a District staff member knowledgeable in Aquifer hydrogeology and acceptable to the City to the City's Habitat Conservation Plan Scientific Advisory Committee.
G. The District will ensure that a City staff member knowledgeable in Aquifer hydrogeology or salamander biology and acceptable to the District serves on the District's Habitat Conservation Plan Management Advisory Committee.
H. The District will recommend to Groundwater Management Area (GMA) 10 and support the inclusion of a suitable City staff member as an advisory committee member if a GMA 10 advisory committee is formed.

V. Recharge Enhancement

A. The City and the District will coordinate to identify and possibly implement mechanisms to reduce demand on the Aquifer as a water supply or otherwise augment water in the Aquifer.
B. The City and the District will share information and coordinate on planned recharge enhancement or aquifer storage projects.
C. Under the terms of the City's HCP and if requested by the City, the District will agree to provide available in-kind support to recharge enhancement projects conducted on City land, including cave debris cleaning or salamander habitat improvement projects.

VI. Groundwater Withdrawal

A. The District will consider the City's input, including new scientific information, in determining if the current Desired Future Conditions of the Aquifer during drought will be sufficient to maintain discharge and dissolved-oxygen levels at Barton Springs to be protective of endangered salamander populations.

B. The City will evaluate potential options for reducing demand on the Aquifer as a water supply, such as the following:
    - Enabling interconnections to the City water system by certain District Public Water Supply Historic-Use permittees during declared drought as a substitute water supply with a commitment to annexation in exchange for greater than mandatory curtailments during the interconnection period; and
    - Providing treated effluent to certain other District permittees during declared drought as a substitute water supply for non-potable uses.

C. The District will maintain rules that prevent re-permitting of retired historic use and quantified additional recharge from recharge enhancement facilities within the District as additional firm-yield supply.

D. The District will ensure City-designated WPD staff members are provided public notices of administratively complete well applications.

E. The District will notify the City of authorized well drilling activities within the Barton Springs Risk Management Zone, as delineated on the mutually agreed map.

F. The City will ensure District-designated staff members are provided public notices of City activities within and of interest to the District.

VII. Other Related Commitments

A. The City will coordinate with the District on subsurface dissolved oxygen augmentation efforts in improving salamander habitats of the Barton Springs Complex during extreme low flow conditions that result in decreases of dissolved oxygen below the highest threshold demonstrated to compromise survival of endangered salamanders. These dissolved oxygen augmentation activities, including feasibility study, pilot-scale demonstration of concept, and implementation of full-scale system, will require separate and sequential approval by both parties, dependent on the findings and conclusions in the preceding study, and will follow a written procedural plan that is agreed to in advance by the City and the District and approved by the U.S. Fish and Wildlife Service. Dissolved oxygen augmentation must not adversely affect salamander populations or their habitat, as determined solely by the City. City participation and permission of access to Barton Springs by the District are contingent upon determination by the City throughout the process that the project will not substantially and adversely alter existing groundwater flow paths and will not directly or indirectly harm existing salamander habitat. The City shall be responsible for compliance with all City permitting and regulatory requirements associated with such efforts.

B. The City, during Extreme Drought conditions as declared by the District, will maintain the normal operational water level of Barton Springs Pool.

C. The District will coordinate with the City to conduct a study of the distribution of the DO concentrations throughout the surface (epigean) environment, including all then-flowing spring runs in the Barton Springs Complex and the main Barton Springs pool, and in the subsurface within the Aquifer by hydrologic and hydrogeologic zones at both non-storm high (generally defined as when Barton Springs discharge is 75 cfs or greater) and low (generally defined as when Barton Springs discharge is lower than 30 cfs) water levels.

D. The District and the City will partner to investigate the feasibility and, if feasible, study the habitat characteristics of the Aquifer by installing two or more wells, with at least one well proximal to Barton Springs and its salamander habitat and at least one well proximal to the known habitat of the salamander population remote from Barton Springs. The City will

facilitate, as necessary, acquiring and maintaining access to the wells for aquifer and ecology monitoring.

E. To support the City's Austin Salamander Conservation Center captive salamander population research and refugium, the District will collect water quality samples and measure corresponding groundwater levels from the Austin Nature and Science Center well at least five times over five years, including twice during high aquifer water levels and twice during low aquifer water level conditions, and analyze the samples for major cations and anions, DO, nitrates + nitrites, and *E. coli* bacteria and other parameters as mutually agreed to.

VIII. TERM, TERMINATION

A. This Agreement shall be effective from and after the date of execution by all parties and shall expire upon the expiration of the latter of the Incidental Take Permits issued by the U.S. Fish and Wildlife Service to each party, unless previously terminated pursuant to this Agreement.

B. This Agreement may not be altered, amended, or modified except in writing, approved by the Board and the City Manager of the City of Austin or designee.

C. If either party defaults in the performance of any of the terms or conditions of this Agreement, the defaulting party shall have 60 days after receipt of written notice of the default within which to cure the default. If such default is not cured within 60 days, then the offended party shall have the right without further notice to terminate this Agreement.

D. The other subsections of this section notwithstanding, should either the City or the District have their respective Incidental Take Permits from the U.S. Fish and Wildlife Service terminated or amended in such a way that this Agreement is no longer a required provision of the ITP, this Agreement is terminated, and another one may be initiated at the parties' mutual agreement.

IX. MISCELLANEOUS

A. Severability. If any section, subsection, sentence, clause or phrase of this Agreement is for any reason held to be unconstitutional, void, or invalid, the validity of the remaining portions of the Agreement shall not be affected thereby. It is the intent of the parties signing this Agreement that no portion of it, or provision or regulation contained in it shall become inoperative or fail by reason of unconstitutionality or invalidity of any other section, subsection, sentence, clause, phrase, provision or regulation of this Agreement.

B. Law and Venue. This Agreement shall be governed by the laws of the State of Texas. The obligations under this Agreement are performable in Travis County, Texas. It is expressly understood that any lawsuit or litigation arising out of or relating to this contract will take place in Travis County, Texas.

C. Entire Agreement. This Agreement constitutes the entire agreement between the City and the District. No other bilateral agreement, statement or promise relating to the subject matter of this Agreement that is not contained in this Agreement is valid or binding.

D. Notice. Notices to either party shall be in writing and may be either hand delivered or sent by certified or registered mail, postage paid, return receipt requested. If sent to the parties at the addresses designated herein, notice shall be deemed effective upon receipt in the case of hand delivery and three days after deposit in the U.S.P.S. mail in case of mailing.

The address of the City for all purposes under this Agreement and for all notices herein shall be:

City of Austin
Watershed Protection Department
Attn: Jose M. Guerrero, PE, Interim Director
505 Barton Springs Rd, 11th Floor
Austin, TX 78704

The address of the District for all purposes under this Agreement and for all notices herein shall be:

Alicia Reinmund-Martinez, General Manager
Barton Springs Edwards Aquifer Conservation District
1124 Regal Row
Austin, TX 78748

E. Indemnity. To the extent allowed by Texas law, each party agrees that it is responsible to the exclusion of any such responsibility of any other party for its own proportionate share of liability for its negligent acts and omissions for claims, suits, and causes of action, including claims for property damage, personal injury and death, arising out of or connected to this Agreement and as determined by a court of competent jurisdiction, provided that the execution of this Agreement will not be deemed a negligent act.

F. Appropriations. Nothing in this Agreement may be construed to obligate the parties to any current or future expenditures in excess of amounts duly appropriated by their respective governing body.

WHEREFORE, the parties have executed this Agreement hereto, as follows:

CITY OF AUSTIN

BY: _____ DATE: 5/8/2019
Rey Arellano
Assistant City Manager

APPROVED AS TO FORM:

BY: _____
Chad Shaw
Assistant City Attorney

BARTON SPRINGS EDWARDS AQUIFER CONSERVATION DISTRICT

BY: _____ DATE: 4/11/2019
Blayne Stansberry, President
Barton Springs Edwards Aquifer Conservation District

ATTEST: Blake Dorsett DATE: 4/11/19

Blake Dorsett
Board Secretary

APPROVED AS TO FORM:

BY: Bill Dugat DATE: April 11, 2019

Bill Dugat
District General Counsel

INTERLOCAL AGREEMENT BETWEEN
THE BARTON SPRINGS EDWARDS AQUIFER CONSERVATION DISTRICT
AND THE CITY OF AUSTIN

This Interlocal Agreement ("Agreement") is made by and between the Barton Springs Edwards Aquifer Conservation District, a political subdivision of the State of Texas acting by and through its duly elected Board of Directors or designee ("the District") and the City of Austin, Texas, a home-rule municipality and political subdivision of the State of Texas acting by and through its duly authorized City Manager or designee ("the City").

WITNESSETH:

WHEREAS, the Barton Springs segment of the Edwards Aquifer ("the Aquifer") provides drinking water to more than 60,000 Central Texans and withdrawal of most groundwater from the Aquifer is regulated by the District; and

WHEREAS, Barton Springs (the Springs) is owned and managed by the City and is a recreational and cultural asset to the City visited by more than 700,000 people annually, and

WHEREAS, the Barton Springs Complex, herein considered to be the individual outlets of Parthenia (Main) Spring, Eliza Spring, Old Mill (Sunken Garden) Spring, and Upper Barton Spring, in aggregate, is the primary natural discharge point of the Aquifer and both the Springs and the Aquifer provide habitat for the endangered Barton Springs salamander and endangered Austin blind salamander (together, the Covered Species); and

WHEREAS, goals of the City's Watershed Protection Department (WPD) are to maintain or enhance the existing rate of recharge to the Aquifer and to maintain or enhance critical environmental features like Barton Springs; and

WHEREAS, the District is committed to conserving, protecting, enhancing recharge, and preventing waste of groundwater and to preserving all aquifers within the District; and

WHEREAS, a conservation measure of the City's Habitat Conservation Plan for the Operation and Maintenance of Barton Springs and Adjacent Springs requires the expeditious development of a cooperative agreement with the District to formalize collaborative efforts to protect endangered endemic *Eurycea* salamanders and the Aquifer; and

WHEREAS, the conservation measures of the District's Habitat Conservation Plan for groundwater withdrawals by permitted well owners and management of the Barton Springs segment of the Edwards Aquifer require the development of an Inter-local Agreement with the City to formalize collaborative efforts and provide data and analyses important to protection of those endangered species;

WHEREAS, the WPD has been authorized by the City Council and designated by the City Manager to negotiate and execute this Agreement; and

WHEREAS, the City and District have already been successfully collaborating on a range of efforts to protect the quality and quantity of the Aquifer and the Springs on an *ad-hoc* basis:

NOW, THEREFORE, the **District** and the **City** agree to collaborate and coordinate on routine and planned communication, public education, flow/aquifer level measurement, monitoring, regional issues, recharge enhancement, and groundwater pumping matters and to make other related commitments, as follows.

I. Routine and Planned Communication and Public Education

A. The City and the District will meet annually to discuss the status of on-going or planned projects under the respective Habitat Conservation Plans of the City and District and other initiatives that may affect the quality or quantity of groundwater in the Aquifer or that may affect the current status and dynamics associated with the Covered Species and their stewardship.

B. In the spring of even numbered years, the City and the District will consider participation and joint collaboration to support a conference, designated the Kent Butler Summit, to serve as a forum for discussion and sharing of information related to issues affecting the Aquifer and the Covered Species.

C. In the summer of odd-numbered years, the City and the District will collaborate in organizing and hosting an informal technical meeting with other groups and individuals that are conducting studies related to the Barton Springs segment of the Edwards Aquifer. Interested parties will be encouraged to give presentations summarizing their studies.

D. The City and the District will coordinate and collaborate on public education and outreach efforts relating to water quality and quantity preservation of the Aquifer and the endangered species that use the Aquifer as habitat.

E. The City will provide to the District no later than January 31st of each year a copy of the City's scientific research permit (TE833851) report to the U.S. Fish and Wildlife Service ("the Service") as well as any reports and analyses produced by the City during the prior year that pertain to the following:

- Results of surveys of the Covered Species conducted by the City. These may be used to help evaluate responses to groundwater management actions during any low Aquifer water-level and low-flow conditions (herein, less than 30 cfs combined springflow at the Springs);
- Evaluations of Covered-Species habitat during various low-flow conditions,
- Analyses of relative salamander abundance and population characteristics based on observations during low-flow and other conditions
- Water-chemistry characteristics related to flow within the Aquifer and through the spring orifices during normal and low-flow conditions,

The City will also provide digital copies of these data upon request.

F. The City will provide to the District no later than January 31st of each year a copy of the annual report to the U.S. Fish and Wildlife Service ("the Service") for the City's Incidental Take Permit (TE 839031-1) for the operation and maintenance of Barton Springs, or as soon thereafter as made available by the City to the Service.

G. The District will provide to the City no later than the ensuing December 1st after this Agreement is effective and of each year thereafter:

- Reports on aggregate actual groundwater production by permittees by use type for the previous fiscal year and on any estimate of exempt use made by the District for that year,

and if and as requested by the City, supporting and illustrative data and analyses produced during the previous year;

- A summary review of modeling of the Aquifer and of Aquifer water balance modeling, if any, produced during the previous year.
- Laboratory reports or summary spreadsheets of water quality data collected by the District at the Springs during the previous year, and if and as requested by the City, laboratory reports or summary water quality data for sampled springs, wells, or surface sites in the Aquifer area.

H. The District will provide to the City no later than March 15th of each year a copy of the District's Annual Report to the Service for the District's Incidental Take Permit (TE 10607C-0) for Groundwater Use and Management of the Aquifer, or as soon thereafter as made available by the District to the Service.

II. Spring Flow/Aquifer Level Measurement

A. The City will continue to fund the measurement of spring discharge by the United States Geological Survey ("USGS") at Barton Springs (USGS Station 08155500) and real-time telemetry reporting of gage-height and spring dissolved oxygen to the USGS website.

B. The District will continue to fund the measurement and telemetry of water levels in the Lovelady monitor and drought stage indicator well (USGS Station 301237097464801), or some other index well, and real-time telemetry reporting of its water-level data.

C. The City, when Barton Springs combined discharge is estimated to be less than 40 cubic feet per second (cfs) according to the USGS gage at the Springs, will make manual discharge measurements of main Barton Springs, Eliza Spring and Old Mill Spring and of total Barton Springs complex springflow from all outlets at least monthly, and when the discharge is estimated to be 22 cfs or below, twice per month; in both circumstances, the City will share the manual discharge measurements with the District within one week of the measurement date.

D. The District, when Barton Springs combined discharge approaches a drought stage threshold (38 cfs, 20 cfs, 14 cfs, and 10 cfs), as estimated by the corresponding water-level elevations at the USGS gage at the Lovelady monitor and drought-indicator well, will make manual discharge measurements of total springflow of Barton Springs as needed to confirm Barton Springs flow for assessing drought stage status and prognosis, and share the manual discharge measurements with the City within one week of the measurement date.

E. The City and the District will collaborate to improve the accuracy of measurement of combined total discharge from the Barton Springs Complex where feasible. The District and the City will notify the USGS when the gage's reported instantaneous spring flow values differ from the manual measurements made by either party by 20%.

F. The City will consider the District's input into the evaluation of the preliminary engineering feasibility review, design and installation of new flow measurement equipment or construction of an improved flow measurement structure or structures to more accurately measure total discharge from the Barton Springs Complex if the City pursues capital projects to improve spring flow measurement.

G. The City and the District will coordinate on joint flow loss studies in the recharge zone. Such collaboration may involve District contributions of in-kind support or District Board of Directors (Board)-approved and budgeted financial support.

III. Monitoring

A. The City will request permission of, receive authorization from, and coordinate with the District on all City-conducted dye tracing activities of the Aquifer, including documenting shared roles and responsibilities, as applicable.

B. The District will notify the City of dye tracing activities within the Aquifer. The City and the District will determine, in advance of the dye trace and as applicable, which entity will be responsible for sampling designated wells and springs for the term of the trace and document responsibilities in a written plan for each trace.

C. The City will continue Barton Springs salamander and Austin blind salamander surveys, including both routine quarterly surveys and any exception-based surveys, pursuant to the City's federal permits TE 833851 and TE 839031.

D. The City will continue water quality monitoring of the Barton Springs Complex pursuant to the most current version of the City's Texas Pollutant Discharge Elimination System Municipal Separate Storm Sewer System permit and associated Stormwater Management Plan and provide copies of the annual permit report to the District for routine monitoring, and, if and as conducted, any exception-based monitoring. This continued monitoring by the City specifically includes enabling the continuous monitoring of dissolved oxygen at Barton Springs.

E. The City will facilitate District access to the Barton Springs complex for non-biological sampling. The City will determine if the proposed District sampling activity will be consistent with the City's ITP requirements.

F. The City and the District will collaboratively define and evaluate options and assess feasibility, and, if determined feasible, the District will emplace several new subsurface monitors by converting existing and/or installing new wells, including but not limited to:
    - One of the prospective Magellan Longhorn Pipeline monitor wells in the Garrison Park-Amur Street area for multiple use as a sentinel and groundwater/habitat monitoring well;
    - Existing open-hole wells in the recharge zone remote from Zilker Park for conversion to secure habitat monitoring well(s) that allow both groundwater and biological sampling;
    - One or more new multi-port wells in the Edwards/Upper(most) Glen Rose in or near Zilker Park;
    - One or more new open-hole Habitat Monitoring Wells, nearby the new multi-port well in Zilker Park, for periodic or episodic groundwater and biological sampling

G. The City will assess the efficacy of reallocating funds currently used in some or all of its existing groundwater data collection program with the USGS throughout the Barton Springs Zone, herein to include the contributing, recharge, and confined zones of the Aquifer, to provide additional resources for collaborative efforts under this Agreement, including but not limited to installing new "hybrid" wells used for both groundwater and habitat monitoring, periodic sampling of such wells, and analyzing water quality and habitat data from them. .

H. The City will facilitate District access to important existing and future District monitor wells, to include but not be limited to:
    - Lovelady Drought Index well-- assist District and USGS staff with periodic access to the monitor well, if needed;
    - Longhorn Pipeline Monitor Wells—one or more wells to be installed in the Garrison Park-Amur Street area;
    - Ruby Ranch Monitor Well - a multiport well on City property at Ruby Ranch;

- DO Augmentation Wells – mitigation measures, if feasible, in the vicinity of the Barton Springs outlets, as described in subsection VII.A below; and
- Any other groundwater or habitat monitoring wells to be used by the District and/or City that currently exist on City property or that may be installed in the future on City property with the City's concurrence. Such wells may be for groundwater-level monitoring, groundwater chemistry sampling, and/or for habitat characteristics, as described in subsection VII.D below.

IV. Regional Cooperation

A. The City and the District agree to continue to organize and participate in meetings of the Barton Springs Zone Regional Water Quality Protection Plan working group.
B. The City and the District agree to continue to share information and coordinate on studies related to Texas Department of Transportation projects over the Aquifer.
C. The City and the District agree to continue to share information and coordinate actions in response to Texas Commission on Environmental Quality wastewater disposal permit actions within the contributing or recharge zones of the Aquifer.
D. The City and the District agree to continue to share information and coordinate actions in response to proposed State of Texas legislation that may affect the Aquifer.
E. The City has documented its support for service of a District board member or staff person on the City's Environmental Commission in City Code Section 2-1-144 (*Environmental Commission*).
F. The City will add a District staff member knowledgeable in Aquifer hydrogeology and acceptable to the City to the City's Habitat Conservation Plan Scientific Advisory Committee.
G. The District will ensure that a City staff member knowledgeable in Aquifer hydrogeology or salamander biology and acceptable to the District serves on the District's Habitat Conservation Plan Management Advisory Committee.
H. The District will recommend to Groundwater Management Area (GMA) 10 and support the inclusion of a suitable City staff member as an advisory committee member if a GMA 10 advisory committee is formed.

V. Recharge Enhancement

A. The City and the District will coordinate to identify and possibly implement mechanisms to reduce demand on the Aquifer as a water supply or otherwise augment water in the Aquifer.
B. The City and the District will share information and coordinate on planned recharge enhancement or aquifer storage projects.
C. Under the terms of the City's HCP and if requested by the City, the District will agree to provide available in-kind support to recharge enhancement projects conducted on City land, including cave debris cleaning or salamander habitat improvement projects.

VI. Groundwater Withdrawal

A. The District will consider the City's input, including new scientific information, in determining if the current Desired Future Conditions of the Aquifer during drought will be sufficient to maintain discharge and dissolved-oxygen levels at Barton Springs to be protective of endangered salamander populations.

B. The City will evaluate potential options for reducing demand on the Aquifer as a water supply, such as the following:
    - Enabling interconnections to the City water system by certain District Public Water Supply Historic-Use permittees during declared drought as a substitute water supply with a commitment to annexation in exchange for greater than mandatory curtailments during the interconnection period; and
    - Providing treated effluent to certain other District permittees during declared drought as a substitute water supply for non-potable uses.

C. The District will maintain rules that prevent re-permitting of retired historic use and quantified additional recharge from recharge enhancement facilities within the District as additional firm-yield supply.

D. The District will ensure City-designated WPD staff members are provided public notices of administratively complete well applications.

E. The District will notify the City of authorized well drilling activities within the Barton Springs Risk Management Zone, as delineated on the mutually agreed map.

F. The City will ensure District-designated staff members are provided public notices of City activities within and of interest to the District.

VII. Other Related Commitments

A. The City will coordinate with the District on subsurface dissolved oxygen augmentation efforts in improving salamander habitats of the Barton Springs Complex during extreme low flow conditions that result in decreases of dissolved oxygen below the highest threshold demonstrated to compromise survival of endangered salamanders. These dissolved oxygen augmentation activities, including feasibility study, pilot-scale demonstration of concept, and implementation of full-scale system, will require separate and sequential approval by both parties, dependent on the findings and conclusions in the preceding study, and will follow a written procedural plan that is agreed to in advance by the City and the District and approved by the U.S. Fish and Wildlife Service. Dissolved oxygen augmentation must not adversely affect salamander populations or their habitat, as determined solely by the City. City participation and permission of access to Barton Springs by the District are contingent upon determination by the City throughout the process that the project will not substantially and adversely alter existing groundwater flow paths and will not directly or indirectly harm existing salamander habitat. The City shall be responsible for compliance with all City permitting and regulatory requirements associated with such efforts.

B. The City, during Extreme Drought conditions as declared by the District, will maintain the normal operational water level of Barton Springs Pool.

C. The District will coordinate with the City to conduct a study of the distribution of the DO concentrations throughout the surface (epigean) environment, including all then-flowing spring runs in the Barton Springs Complex and the main Barton Springs pool, and in the subsurface within the Aquifer by hydrologic and hydrogeologic zones at both non-storm high (generally defined as when Barton Springs discharge is 75 cfs or greater) and low (generally defined as when Barton Springs discharge is lower than 30 cfs) water levels.

D. The District and the City will partner to investigate the feasibility and, if feasible, study the habitat characteristics of the Aquifer by installing two or more wells, with at least one well proximal to Barton Springs and its salamander habitat and at least one well proximal to the known habitat of the salamander population remote from Barton Springs. The City will

facilitate, as necessary, acquiring and maintaining access to the wells for aquifer and ecology monitoring.

E. To support the City's Austin Salamander Conservation Center captive salamander population research and refugium, the District will collect water quality samples and measure corresponding groundwater levels from the Austin Nature and Science Center well at least five times over five years, including twice during high aquifer water levels and twice during low aquifer water level conditions, and analyze the samples for major cations and anions, DO, nitrates + nitrites, and *E. coli* bacteria and other parameters as mutually agreed to.

VIII. TERM, TERMINATION

A. This Agreement shall be effective from and after the date of execution by all parties and shall expire upon the expiration of the latter of the Incidental Take Permits issued by the U.S. Fish and Wildlife Service to each party, unless previously terminated pursuant to this Agreement.

B. This Agreement may not be altered, amended, or modified except in writing, approved by the Board and the City Manager of the City of Austin or designee.

C. If either party defaults in the performance of any of the terms or conditions of this Agreement, the defaulting party shall have 60 days after receipt of written notice of the default within which to cure the default. If such default is not cured within 60 days, then the offended party shall have the right without further notice to terminate this Agreement.

D. The other subsections of this section notwithstanding, should either the City or the District have their respective Incidental Take Permits from the U.S. Fish and Wildlife Service terminated or amended in such a way that this Agreement is no longer a required provision of the ITP, this Agreement is terminated, and another one may be initiated at the parties' mutual agreement.

IX. MISCELLANEOUS

A. Severability. If any section, subsection, sentence, clause or phrase of this Agreement is for any reason held to be unconstitutional, void, or invalid, the validity of the remaining portions of the Agreement shall not be affected thereby. It is the intent of the parties signing this Agreement that no portion of it, or provision or regulation contained in it shall become inoperative or fail by reason of unconstitutionality or invalidity of any other section, subsection, sentence, clause, phrase, provision or regulation of this Agreement.

B. Law and Venue. This Agreement shall be governed by the laws of the State of Texas. The obligations under this Agreement are performable in Travis County, Texas. It is expressly understood that any lawsuit or litigation arising out of or relating to this contract will take place in Travis County, Texas.

C. Entire Agreement. This Agreement constitutes the entire agreement between the City and the District. No other bilateral agreement, statement or promise relating to the subject matter of this Agreement that is not contained in this Agreement is valid or binding.

D. Notice. Notices to either party shall be in writing and may be either hand delivered or sent by certified or registered mail, postage paid, return receipt requested. If sent to the parties at the addresses designated herein, notice shall be deemed effective upon receipt in the case of hand delivery and three days after deposit in the U.S.P.S. mail in case of mailing.

The address of the City for all purposes under this Agreement and for all notices herein shall be:

City of Austin
Watershed Protection Department
Attn: Jose M. Guerrero, PE, Interim Director
505 Barton Springs Rd, 11th Floor
Austin, TX 78704

The address of the District for all purposes under this Agreement and for all notices herein shall be:

Alicia Reinmund-Martinez, General Manager
Barton Springs Edwards Aquifer Conservation District
1124 Regal Row
Austin, TX 78748

E. Indemnity. To the extent allowed by Texas law, each party agrees that it is responsible to the exclusion of any such responsibility of any other party for its own proportionate share of liability for its negligent acts and omissions for claims, suits, and causes of action, including claims for property damage, personal injury and death, arising out of or connected to this Agreement and as determined by a court of competent jurisdiction, provided that the execution of this Agreement will not be deemed a negligent act.

F. Appropriations. Nothing in this Agreement may be construed to obligate the parties to any current or future expenditures in excess of amounts duly appropriated by their respective governing body.

WHEREFORE, the parties have executed this Agreement hereto, as follows:

CITY OF AUSTIN

BY: _____ DATE: 5/8/2019
Rey Arellano
Assistant City Manager

APPROVED AS TO FORM:

BY: _____
Chad Shaw
Assistant City Attorney

BARTON SPRINGS EDWARDS AQUIFER CONSERVATION DISTRICT

BY: _____ DATE: 4/11/2019
Blayne Stansberry, President
Barton Springs Edwards Aquifer Conservation District

ATTEST: Blake Dorsett DATE: 4/11/19

Blake Dorsett
Board Secretary

APPROVED AS TO FORM:

BY: Bill Dugat DATE: April 11, 2019

Bill Dugat
District General Counsel

Appendix C

Assessment of Progress on HCP Minimization Measures

This 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 2019 Management Plan Annual Report referred to as, *"Appendix B - Assessment of Progress toward Management Plan Goals and Objectives"*

"*Appendix B*" of the District's most recent Management Plan Annual Report is the Board-approved recent assessment by the District staff that describes the activities accomplished and progress made toward achieving the Management Plan and Habitat Conservation Plan goals, objectives, and performance standards. The objectives and their performance standards are described as the HCP Conservation Measures that avoid and minimize take.

That report may be accessed and downloaded via the District's website at:
https://bseacd.org/uploads/FY-2019-Final-Annual-Report-Audit-and-App-B-12.12.19.pdf
.

Management Plan Annual Report FY 2019
Appendix B

(Appendix B)
Assessment of Progress toward
Management Plan Goals and Objectives

Board-approved December 12, 2019

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

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 2019, 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 were presented or made.

In order to achieve the goals, management objectives, and performance standards adopted in the MP, on December 12, 2019, the District's Board of Directors (Board) evaluated progress made, and approved the District's FY 2019 Annual Report, including Appendix A (the annual financial audit), and Appendix B (Assessment of Progress toward Management Plan Goals and Objectives).

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 2019, the District adopted amendments and revisions to the Rules and Bylaws. A quorum of the Board voted unanimously to adopt the proposed revisions at its regular meeting on March 28, 2019. The rulemaking process was formally initiated in February 2019 as part of an ongoing effort to implement Aquifer Storage and Recovery (ASR) projects. There was a 20-day public comment period to provide an opportunity for rule review and to submit comments or formal protests on the proposed rules. The adopted rule amendments focused overall on:

- **Definitions**
- **Application Checklist (Well Drilling and Source & Recovery Permits)**
- **Hydrogeologic Report and Observation Wells**
- **Permit Amendments**
- **Saline Zone Requirements**
- **Aquifer Storage and Recovery Pilot Test**
- **Saline Edwards Modeled Available Groundwater/Desired Future Conditions**
- **Class D Conditional Permits**
- **Aquifer Storage and Recovery (new section)**

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 and permit type will be provided in the Annual Report.

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

FY 2019 Production from Individual Permittees		
Production Zone	Actual Production	Permitted Individual Production
Edwards	1,550,915,519	2,660,777,544
Trinity	200,300,364	506,381,557
Austin Chalk or Alluvial	174,450	2,500,000
Total (Gallons)	**1,751,390,333**	**3,169,659,101**
	(5,374.81 ac ft)	(9,727.31 ac ft)

FY 2019 Production from Limited Production Permits		
Production Zone	Actual Production*	Permitted Limited Production
Edwards	12,235,041	58,500,000
Trinity	4,078,347	19,500,000
Austin Chalk or Alluvial	0	0
Total (Gallons)	**16,313,338**	**78,000,000**
	(50.06 ac ft)	(239.37 ac ft)
**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*		

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 non-regulated 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, Education 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 Management Plan (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 Management Zone (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 Management Zones is also 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) *	**105,514,157**
Est # of wells	1009
cfs	0.45
% of Permitted Production	4.26%
Permitted Edwards Production(gpy)	*2,719,277,544*

**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) *	**120,258,950**
Est # of wells	1150
cfs	0.51
% of Permitted Trinity Production	23%
Permitted Trinity Production (gpy)	*525,881,557*

**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 drought stage graphic on the District home page was updated frequently to indicate drought trigger levels and associated drought conditions. The dynamic graphics shown on the Aquifer Data page were live, and viewed approximately 1,335 times throughout the fiscal year.

The District declared alarm stage drought on July 12, 2018, and lifted the drought declaration on October 15, 2018. The drought status change was publicized through drought stage icons and spotlights on the District website, a press release, eNews articles, and road signs and mailers were made available for use by Permittees.

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 was presented in the monthly status report section of the Board backups, generally in the first meeting of the month. 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 Report section of the meeting agenda.

Protect Your Groundwater Day	September	Target: All residents, permittees, well owners & groundwater users District promotes the National Groundwater Association's awareness campaign,
Rainwater Revival	October	Target: residents, well owners & groundwater users District sponsors and attends this alternate water supply focused educational event.
Teacher Wishlist Materials	October	Target: teachers and informal educators. District educators apply for a chance to receive free water science teaching materials and technology to augment their programs and classes.
Imagine a Day Without Water	October	Target: All residents National awareness media campaign to remind everyone to think about how important water is to our everyday lives and consider what it would be like to not have access to clean, reliable drinking water.
Water Conservation Symposium	January	Target: permittees, policy leaders, water operators, and conservation managers. District is a member and sponsor of the Central Texas Water Efficiency Network—the group that hosts the symposium.
Austin Cave Festival	February	Target: families & residents. District hosts and sponsors Cave Festival at the Wildflower Center with City of Austin Wildlands, Watershed Protection, and Parks and Rec.
Groundwater Awareness Week	March	Target: All residents, permittees District helps promote the National Groundwater Association Groundwater Awareness campaign.
Fix-A-Leak Week	March	Target: Well owners, permittees, and groundwater users District helps promote the US EPA Water Sense water conservation awareness campaign.
Camp scholarships due & chosen	March	Target: students ages 9-15. District collaborates with permittees funds the program. Promotion starts at the beginning of the calendar year.
College scholarship essay contest	March	Target: high school juniors, seniors, and immediate grads in the 8 school districts that cross the District's boundary. Kent Butler Groundwater Stewardship Scholarship as an essay contest. Promotion starts at the beginning of the calendar year.
Well Water Checkup	April	Target: well owners, permittees Well owners can bring in a water sample and have it analyzed for TDS, Nitrate, pH, and bacteria for free.
Endangered Species Day	May	Target: all residents, permittees District helps promote US FWS Endangered Species day and highlights habitat and groundwater management in place to protect the endangered salamanders in the District.
Water Conservation Period	May	Target: well owners, permittees, and groundwater users Runs from May 1 to Sept 31 when the District is not in Drought. Voluntary 10% reduction in pumpage.
Neighborhood Site Visits	May (variable)	Target: well owners in selected neighborhoods. Staff measure water levels (if possible), basic field parameters, and nitrate for free.
National Cave and Karst Day	June	Target: all residents, permittees District highlights role of caves and karst, surface water and groundwater interaction, and endangered species protection.
Groundwater to the Gulf	June	Target: teachers and informal educators. District is a lead organizer for the training and coordinates with 13

		other agencies to put on the training. Provides teachers with hands-on activities to use in the classroom to highlight groundwater, surface water, and habitats.
WFC Nature Nights	June	Target: residents and families The District participates in the WFC program with an activity about water conservation and/or recharge water quality protection.

In FY 2019, some highlights of the Education and Community Outreach Team included:

- **Participated in more than 30 outreach events (including field trips, presentations, and events) that reached approximately 3,800 adults and 4,200 children - a significant increase from last year.**

- **eNews bulletins were opened over 13,400 times from over 2,900 subscribers. Facebook posts were viewed 27,900 times. Twitter posts made 17,800 impressions. The web pages were viewed 39,700 times.**

- **Collaborated with Aquifer Science staff on the Travis County Groundwater Study. The Travis County Groundwater Project Group (including staff from the Aquifer Science and Education Outreach Teams) organized neighborhood site visits to collect water data in five different areas within the southwest Travis County study area. The visits took place in Hamilton Pool/Pedernales, Spicewood/Briarcliff, Lakeway/The Hills/Hudson Bend, Bee Cave, and Westlake/Lost Creek/Oak Hill areas. Approximately 50 well owners participated in the site visits and approximately 50 additional field measurements were taken. Water level and water quality analysis was collected from the over 100+ data collection points. Presentations were made to the Travis County Commissioners and the Southwestern Travis County Groundwater Conservation District (SWTCGCD) Board.**

- **Approximately 47 well owners in the District brought in water samples for the free water well screening for common contaminants during the Well Water Checkup.**

- **Co-hosted the 9th Annual Central Texas Water Conservation Symposium "Integrated Water: Keeping Conservation at the Forefront" in collaboration with the water providers and non-profit organizations participating in the Central Texas Water Efficiency Network (CTWEN).**

- **Co-hosted the 14th Annual Groundwater to the Gulf Summer Institute for Educators in collaboration with other state, local, and non-profit water educators, which trained 33 teachers and educators who in turn reach over 8,000 students annually.**

- **Co-hosted the Austin Cave Festival at the Lady Bird Johnson Wildflower Center, which attracted record attendance.**

- **Sponsored the 2018 Rainwater Revival and Hill Country Living event that brings rainwater harvesting system installers, suppliers, water haulers and other experts together to serve as a resource for homeowners and businesses that are interested in using rainwater as an alternate supply.**

- **Awarded two $2,500 college scholarships to Ian McIntosh from Liberal Arts & Science Academy for his essay titled "The Impact of Water on the Arthropods of Bull Creek," and Emma Cook from Hays High School for her essay titled "Expanding the Clean Water Act to**

Better Protect Groundwater Resources" with the support from District permittees' FY 2018 conservation credit donations.

- **Provided 20 scholarships for students ages 9-15 to attend Aquatic Science Adventure Camp hosted by the Edwards Aquifer Research and Data Center, with the support from District permittees' FY 2018 conservation credit donations.**

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 received and approved the FY 2019 Annual Financial Audit report provided by the District's financial auditor at its meeting on December 12, 2019. It is included with this Annual Report as Appendix A.

Timely develop and approve fiscal-year budgets and amendments.

For FY 2019, there were four budget versions. The initial budget was brought before the Board in a properly-noticed public hearing held on August 9, 2018 where it was approved. The Board approved Budget Revision 1 on March 14, 2019; Budget Revision 2 on June 27, 2019; and Budget Revision 3 on July 25, 2019.

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.

Administrative staff 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.

Administrative staff developed, posted and distributed all materials and backup documentation for all 19 District Board meetings held in FY 2019. All meeting minutes meeting were approved by the

Board at each meeting. Administrative staff maintained the officials 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 no election in FY 2019.

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 non-speculative 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 2019 is provided in the table below.

Processed Permit Applications	FY17	FY18	FY19
Minor Amendment	3	6	5
Major Amendments	0	7	0
New Exempt Well	9	4	10
Limited Production Permit (Nonexempt Domestic Wells)	22	14	16
Individual Production Permit	4	4	3
Individual Well Drilling Authorizations or Well Modification	3	3	8
Test Well	0	2	1
Well Plugging	10	8	5
Replacement Well	0	1	0
TOTAL	51	49	48

A summary of the individual production permits processed in FY 2019 is provided in the table below.

	Annual Volume (gpy)	Production Permits Processed	Permit Type	Use Type	Aquifer
1	1,600,000	BGSIX Holdings LLC	Historical Trinity	Irrigation	Trinity
2	100,000	Hays County	Historical Trinity	Industrial	Trinity
3	179,965,440	Needmore Water LLC	Historical Trinity	Agricultural Livestock	Trinity
4	*912,500,000**	*Electro Purification**	*Historical Trinity*	*Wholesale PWS*	*Trinity*
** This application was processed as administratively complete and is currently pending at the State Office of Administrative Hearings (SOAH). Final permit action and Board Decision has not taken place.*					

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 2019, the Regulatory Compliance Team conducted a number of inspections relating to the processing of permit applications. Staff completed a total of 30 inspections related to special investigations, site permittee inspections, and well permit applications. The Regulatory Compliance Team collected 23 water quality samples during routine permit inspections or from new well construction inspections. There were no formal enforcement actions initiated in FY 2019.

FY 2019 Inspections/ Investigations/ Visits	
Exempt Well Inspections	6
Limited Production Permit Inspections	17
Individual Production Permit Inspections	0
Test Well Inspections	0
Plugging Inspections	5
Special Investigation Inspections	2
Other Permittee Meetings/Visits *	5
**Multiple meetings were held with some permittees.*	
TOTAL	**35**

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

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.

The GM served as the primary point of contact, and coordinated with Brian Sledge of SledgeLaw Group PLLC, the District's legislative consultant, and the appointed Board Legislative Committee members (Blayne Stansberry and Dr. Robert D. Larsen) to monitor bills of interest to the District. Efforts included bill tracking and analysis, and meeting and providing information to legislators.

The following is a synopsis of the fate of certain priority bills of direct interest to the District:

- **HB 478 by Phelan. Relating to the funding of flood planning, mitigation, and infrastructure projects. Did not pass out of House Natural Resources Committee.**
- **HB 720 by Larson and Perry. Relating to appropriations of water for use in aquifer storage and recovery projects. Passed. Effective date June 10, 2019.**
- **HB 721 by Larson and Perry. Relating to the duty of the Texas Water Development Board to conduct studies of and prepare and submit reports on ASR. Passed. Effective date June 14, 2019.**
- **HB 722 by Larson and Perry. Relating to the development of brackish groundwater. Passed. Effective date September 1, 2019.**
- **HB 726 by Larson. Groundwater omnibus bill. Did not pass out of the Senate Water and Rural Affairs Committee.**
- **HB 790 by Davis. Relating to recovery of attorney's fees in certain civil cases. Did not pass to a Senate Committee.**
- **HB 807 by Larson and Buckingham. Relating to the state and regional water planning process. For a regional water planning area with significant identified water needs, the potential for ASR must be assessed. Passed. Effective date June 10, 2019.**
- **HB 817 by King. Relating to a restriction on permits authorizing direct discharges of waste or pollutants into water in certain areas of the Edwards Aquifer. Did not pass out of the House Natural Resources Committee.**
- **HB 1066 by Ashby and Perry. Relating to extensions of an expired permit for the transfer of groundwater from a groundwater conservation district. Passed. Effective date September 1, 2019.**
- **HB 1304 by Zwiener. Relating to the Hays Trinity Groundwater Conservation District. Did not pass out of the House Natural Resources Committee.**

- **SB 483 by Campbell and Zwiener. Relating to permits for certain injection wells that transect a portion of the Edwards Aquifer. Passed. Effective date June 10, 2019.**

- **SB 520 by Campbell and Kuempel. Relating to the storage and recovery of water in a portion of the Edwards Aquifer. Passed. Effective date September 1, 2019.**

- **SB 669 by Buckingham and Goodwin. Relating to the date for the confirmation election for the Southwestern Travis County Groundwater Conservation District. Passed. Effective date May 20, 2019**

- **SB 1010 by Perry. Relating to rules adopted by groundwater conservation districts overlying a common aquifer. Did not pass out of the House Natural Resources Committee.**

The SledgeLaw Group provided a legislative debriefing report to the Board at the June 13, 2019 meeting. The Board accepted the report as presented – satisfying this performance standard.

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

District staff actively participated in the following land-use activities that have the potential to affect groundwater resources:

- **Wastewater Meeting with multiple agencies – attended meeting with the Guadalupe Blanco River Authority (GBRA), City of Austin (CoA), City of San Marcos, Save Barton Creek Association (SBCA), Clearwater Water Supply Corporation and the Edwards Aquifer Authority (EAA) to discuss water quality concerns and potential legislation.**

- **State Highway 45 SW Roadway Project – coordinated site visits with consultant in the evaluation of the stormwater control structures, and reviewed and approved inspection reports.**

- **MoPac Intersections Roadway Project – performed periodic site inspections, provided guidance on mitigating karst features, and performed periodic inspections on environmental and stormwater control structures.**

- **Proposed Sawyer-Cleveland Wastewater Treatment Plant (WWTP) – submitted letter to Texas Commission on Environmental Quality (TCEQ) on behalf of the District, stating the reasons why the District opposed the proposed WWTP in the Barton Creek watershed.**

- **Kinder Morgan LLC Permian Highway Natural Gas Pipeline – presented at several public events on the possible impacts to the groundwater resources in Hays County, organized a technical discussion between Kinder Morgan officials and groundwater conservation districts (GCDs), submitted a formal request for technical information to Kinder Morgan, and submitted an official request to the Railroad Commission of Texas for a meeting to receive information on the Commission's oversight of oil and gas pipelines.**

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 non-speculative 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 non-speculative 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 2019 is provided in the table below.

Processed Permit Applications	FY17	FY18	FY19
Minor Amendment	3	6	5
Major Amendments	0	7	0
New Exempt Well	9	4	10
Limited Production Permit (Nonexempt Domestic Wells)	22	14	16
Individual Production Permit	4	4	3
Individual Well Drilling Authorizations or Well Modification	3	3	8
Test Well	0	2	1
Well Plugging	10	8	5
Replacement Well	0	1	0
TOTAL	51	49	48

A summary of the individual production permits processed in FY 2019 is provided in the table below.

	Annual Volume (gpy)	Production Permits Processed	Permit Type	Use Type	Aquifer
1	1,600,000	BGSIX Holdings LLC	Historical Trinity	Irrigation	Trinity
2	100,000	Hays County	Historical Trinity	Industrial	Trinity
3	179,965,440	Needmore Water LLC	Historical Trinity	Agricultural Livestock	Trinity
4	*912,500,000**	*Electro Purification**	*Historical Trinity*	*Wholesale PWS*	*Trinity*
** This application was processed as administratively complete and is currently pending at the State Office of Administrative Hearings (SOAH). Final permit action and Board Decision has not taken place.*					

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).

Worked cooperatively and closely with the Ruby Ranch Water Supply Corporation (WSC) and their consultants to conduct phase four of ASR pilot testing initiated in 2017 and ending in 2019 with an ASR application to the TCEQ (the 4th in Texas). The District assisted with hydrogeologic evaluations, and water level and water chemistry sampling throughout all phases of pilot testing.

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 several times with City of Buda staff and their consultant as they prepared a permit application for an ASR system.

Staff met with Creedmoor-Maha WSC board and staff to discuss the potential for desalination and ASR as potential sources of water.

Regulatory Compliance and Aquifer Science Teams had discussions with Bill Walters (Gragg Tract) on the pilot-testing of the Lower Trinity Aquifer. District staff sampled the initial test production well (5850755) and helped plan an aquifer test (for FY 2020) of two additional potential supply wells in the Lower Trinity Aquifer.

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 was presented in the monthly status report section of the Board backups, generally in the first meeting of each month. 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 Report section of the meeting agenda. Please see table in Objective 1-4 for a schedule of events and programs.

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

Please see Section 1-4 Highlights.

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 2019, District staff attended all four meetings of the Lower Colorado Regional Water Planning Group (LCRWPG) – October 24, 2018, January 9, 2019, April 24, 2019, and July 10, 2019 and attended the Unique Stream Segments Committee Meeting held on April 11, 2019. Highlights from these four meetings of the LCRWPG include the following:

October 24, 2018 – consultants made presentations on the Water Management Strategies Committee meeting and the strategies that were scoped for evaluation during the 2016 planning cycle. LCRWPG approved the notice to proceed for the partial scope of work for the consultants.

January 9, 2019 – besides committee update reports, the consultants made a presentation on the overall progress of the planning process and the updates to non-Modeled Available Groundwater availability – the non-relevant groundwater sources. The LCRWPG created the Unique Stream Segment Committee.

April 24, 2019 – the Committees provided update reports, and the consultants presented progress to date and a summary of Chapter 2, which was available for review. Also, the TWDB presented an overview of the Brackish Resources Aquifer Characterization System study.

July 10, 2019 – the TWDB presented a summary of the bills that were approved in the 86th legislative session; and the consultant provided a summary of the LCRWPG committees, including Water Management, Legislative/Policy and Water Modeling Committees. The consultant presented the comments received to date on Chapter 2, and informed the planning group of the availability of Chapters 1 and 3 in October.

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 32 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 (32 sites in FY 2019). All data has been compiled in the TWDB database that is publicly available. In addition, staff has repeatedly visited and sampled numerous wells in areas reporting or anticipating problems such as the Electro Purification LLC (EP) and Summer Mountain Ranch areas.

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.

District staff have refined analytical models for use in the evaluation of the potential for unreasonable impacts. These include analytical modeling for the EP permit request, and a potential Phase I that has low potential for unreasonable impacts.

District staff provided key technical support in the development of a conceptual model for the aquifers of the Blanco River watershed. That report (Martin et al., 2019[1]) was published at the end of FY 2019. The next step is to develop a numerical model from the conceptual model in FY 2020.

District staff compiled and collected new hydrogeologic data in a cooperative study with Travis County on the groundwater resources of Southwestern Travis County. Results provide key insights into the Middle and Lower Trinity Aquifers within and adjacent to the District. These studies will help inform conceptual and numerical models of the region.

- **https://bseacd.org/2019/11/blanco-river-aquifer-assessment-tool-a-tool-to-assess-how-the-blanco-river-interacts-with-its-aquifers-creating-the-conceptual-model/**
- **https://bseacd.org/projects/travis-county-groundwater-study/**

A review of the data mentioned above will be assessed for significant changes and reported in the Annual Report.

No significant changes were observed in water-level and water-quality data during FY 2019, although water levels in the Edwards and Trinity Aquifers started dropping due to a very dry summer. The exception is the significant decline in Trinity water levels over time west and adjacent to the District within Southwestern Travis County. These data indicate the need for additional Trinity monitoring data in the northern portion of the District.

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.

- **Aquifer Science staff are continuing to collect data in the EP and Needmore areas and are working with Hays County and HTGCD to install additional monitor wells near Jacobs's Well and west of EP. As additional data become available, further analyses will be conducted.**

- **As indicated above, development of numerical models is underway to assist in the evaluations of potential impacts.**

- **Aquifer Science staff discussed and presented suggested revisions to the Trinity desired future condition (DFC) to increase the ability to accurately monitor and assess its compliance considering large permit requests.**

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 32 samples from sample sights including wells and springs from the Edwards and Trinity Aquifers for major ions and isotopes.**

- **The Regulatory Compliance Team collected 23 water quality samples during routine permit inspections or from new well construction inspections.**

- **All teams worked in collaboration with the Texas State Edwards Aquifer Research and Data Center (EARDC) laboratory to offer a free water well screening for private wells in the area. Well owners collected their own samples and dropped them off at the District office to be screened for common contaminants; approximately 47 well owners participated during the 2019 Water Well Checkup (April 2019).**

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 non-speculative 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 2019 is provided in the table below.

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Individual Production Permit	4	4	3
Individual Well Drilling Authorizations or Well Modification	3	3	8
Test Well	0	2	1
Well Plugging	10	8	5
Replacement Well	0	1	0
TOTAL	51	49	48

A summary of the individual production permits processed in FY 2019 is provided in the table below.

	Annual Volume (gpy)	Production Permits Processed	Permit Type	Use Type	Aquifer
1	1,600,000	BGSIX Holdings LLC	Historical Trinity	Irrigation	Trinity
2	100,000	Hays County	Historical Trinity	Industrial	Trinity
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4	*912,500,000**	*Electro Purification**	*Historical Trinity*	*Wholesale PWS*	*Trinity*
** This application was processed as administratively complete and is currently pending at the State Office of Administrative Hearings (SOAH). Final permit action and Board Decision has not taken place.*					

Objective 4-4. Actively participate in the joint planning processes for the relevant aquifers in the District to establish and refine 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.

District staff attended 100% of the GMA 9 and GMA 10 meetings that were held in FY 2019. Following is a summary of these meetings:

GMA 9

District staff attended all four GMA 9 general meetings as well as a technical committee meeting held in FY 2019. The first meeting on November 5, 2018 was held in Dripping Springs. At this meeting, the committee discussed a resolution regarding portions of the northern Medina County and the annual review of individual GCD management plans. The second meeting was held on February 4, 2019 in Kerrville. At this meeting, discussions on possible revisions to the GMA 9 DFCs as well as standardization of monitor well analysis and reporting occurred. The technical committee meeting of March 12, 2019 was hosted by the Cow Creek GCD in Boerne. The technical subcommittee, including District staff, discussed further the standardization of monitor well analysis and reporting to aid monitoring of DFCs. The third general meeting hosted by the SWTCGCD in Bee Caves on April 22, 2019 concentrated on TWDB updates. There is a new water services boundary viewer that links to the TCEQ database which allows access to information about wells, depths, pumping rates, volumes for customers, etc. TWDB also presented on an upcoming brackish groundwater study for the Trinity Aquifer south of the Colorado River. The fourth general meeting for GMA 9 took place June 17, 2019 in Boerne. It concentrated on administrative work and the selection of Blanton & Associates to compile the next Explanatory Report for GMA 9.

GMA 10

District staff attended all three GMA 10 meetings held in FY 2019. All meetings were held at the EAA in San Antonio. The first meeting was held on October 18, 2018. At this meeting, the Committee approved the reassignment of the Medina County GCD solely to GMA 10, and had preliminary discussions on the District's proposal to establish a new DFC for the Trinity Aquifer. The second meeting was held on January 7, 2019, where the Committee appointed Alicia Reinmund-Martinez as the GMA 10 representative to the Regional Water Planning Group K. Also, the Committee discussed in more detail the District's proposal to amend the DFC for the Trinity Aquifer. The third meeting was held on April 8, 2019, where the Committee had a general discussion on the GMA 10 evaluation needs for the development of the 2022 DFCs as well as a summary of approved bills from the 86th legislative session. On August 8, 2019, the District hosted a meeting with representatives from the Plum Creek CD and the Comal Trinity GCD to obtain initial feedback on the District's proposal to modify the DFC expression for the Trinity Aquifer. With this feedback, District staff presented a final proposal at the September 16, 2019 general meeting of the GMA 10 Joint Planning Committee.

Objective 4-5. Implement the measures of the District 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.

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. To celebrate the event, the District and USFWS held a signing celebration to acknowledge the contributions and persistence of the advisory committee, stakeholders, staff, Directors, consultants, and researchers that helped develop the HCP over the years. On April 11, 2019, the Board approved an Interlocal Agreement between the District and the CoA to collaborate and coordinate on routine and planned activities relative to each entity's respective HCP. The first HCP Annual Report will be submitted to the USFWS by February 28, 2020.

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 non-drought, 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.

District 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.

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 triggers are indeed representative of drought conditions, regardless of the aquifer.

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

FY 2019 began with a status of Stage II Alarm Drought declared by the Board on July 12th, 2018. An average of 13 inches of rain in September to October provided much needed recharge to the Edwards and Trinity Aquifers. These rains revived aquifer water levels and Barton Springs flow, elevating to above Stage II Alarm drought warning levels. The Board subsequently updated the drought status from Stage II Alarm Drought to NO Drought on October 11th, 2018. The calendar year ended with some of the wettest December weather ever recorded. By New Year's Eve, six inches of rain had fallen in Austin and the Hill Country for the month of December, more than two times the average. January 2019 provided about 3 additional inches, exceeding its historical average of 1.9 inches.

A combined 14 inches of spring rain fell in May and June 2019 providing even more recharge. Barton Springs flow quickly responded to the fall 2018 rains and additional spring 2019 rains to maintain an average daily spring flow of 100cfs throughout FY 2019. On June 14th, 2019, water level measurements in the Lovelady monitor well had risen to surpass the third highest peak recorded in 2003 (536.0 ft-msl or 117.4 ft-dtw).

Summer came with a drying trend. Below-average rainfall initiated a rapid decline at the Lovelady monitor well beginning July 15, 2019. This decrease has continued through a dry fall season and is projected through the winter.
To summarize, the Austin/Hill Country area has received an average 27 inches of rainfall so far in 2019, producing significant recharge for local aquifers. However, official forecasts point toward drier and milder-than-normal conditions across Central Texas, which will likely result in further declines as 2020 gets underway. We hope spring will bring its usual upward swing of recharge to keep our aquifers well-supplied.

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 declared Stage II Alarm Drought on July 12, 2018 and remained in Stage II status throughout October 11, 2018. The District has implemented all drought-related rules and curtailments in accordance with the District's enforcement plan and drought management protocols. Drought enforcement measures were assessed for Stage II Alarm Drought for the entire duration of the drought. A monthly drought compliance report for all individual permittees was provided during the months of August 2018 – September 2018 to the Board during District-declared drought, and those reports are found on the drought management website pages. After lifting drought in October, the District was in No-Drought status the remainder of FY 2019.

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 declared alarm stage drought on July 12, 2018, and lifted the drought declaration on October 15, 2018. The drought status change was publicized through drought stage icons and spotlights on the District website, a press release, eNews articles, and road signs and mailers were made available for use by Permittees.

Articles included:

- **August/September 2018: Trinity Aquifer Trends**
- **October: Aquifer District Lifts Drought Restrictions**
- **January: Recharge in Action**
- **January: Climate Change and the Edwards Aquifer**

- **March:** **Save Water… Fix Leaks**
- **April:** **Use Water Wisely (Water Conservation Period)**
- **April:** **Aquifer Status/Predictions**
- **June:** **Aquifer Status**

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.

eNews: **Trinity Aquifer Trends (August/September 2018)**
Press release: **Aquifer District Lifts Drought Declaration (October 2018)**
eNews: **Recharge in Action (January 2019)**
eNews/event: **Water Conservation Symposium (January 2019)**
eNews: **Save Water… Fix Leaks (March 2019)**
eNews: **Use Water Wisely (April 2019)**
Press release: **Aquifer District Enters Water Conservation Period (May 2019)**

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.

During the spring and summer 2019, the regulatory staff work 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 shall have current UDCPs and UCPs on file that are updated in accordance with District rules. Permittees have the option to revise drought target charts no more than once per year but must update their UDCP and UCP plans at least every five years. Staff completed a full update for all permittees to ensure that each file included updated drought templates (Drought Target Chart, UDCP, UCP).

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 non- speculative 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 conducted an underpumpage analysis and determined that while many permittees' actual production was less than the authorized permitted amount, it was typically due to bringing on alternative supplies or water conservation. Therefore, authorized permitted volumes were not reduced in FY 2019.

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 above in the Objective 1-2 Performance Standard update. 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, and 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 Annual Report.

Each permittee is required to have an approved UDCP that outlines conservation actions to be taken under each drought stage.

District staff provides bill inserts and road signs to all permittees upon drought declaration to help them comply with messaging requirements set forth in the UDCP.

District staff actively promotes aquifer status through eNews, press releases, and the District website. Permittees are encouraged to share this information with their end users.

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

The District declared alarm stage drought on July 12, 2018 and lifted the drought declaration on October 15, 2018. The drought status change was publicized through drought stage icons and spotlights on the District website, a press release, eNews articles, and road signs and mailers were made available for use by Permittees.

Articles included:

- **eNews: Trinity Aquifer Trends (August/September 2018)**
- **Press Release: Aquifer District Lifts Drought Declaration (October 2018)**
- **eNews: Recharge in Action (January 2019)**
- **eNews/event: Water Conservation Symposium (January 2019)**
- **eNews: Save Water… Fix Leaks (March 2019)**
- **eNews: Use Water Wisely (April 2019)**
- **Press Release: Aquifer District Enters Water Conservation Period (May 2019)**

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. This year the theme was: "Integrated Water: Keeping Conservation at the Forefront." The symposium is structured to provide information about 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 Rainwater Revival and Hill Country Living Festival, the Central Texas Water Conservation Symposium, Austin Cave Festival, LBJ Wildflower Center (LBJWFC) Nature Nights Rocks-Water-Mud, and Groundwater to the Gulf: A Summer Institute for Educators.

This fiscal year approximately seven press releases and eNews articles discussed aspects of water conservation and alternate water supply.

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 District staff in FY 2019 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 2019, the District has worked with other entities in the area, such as City of Buda, City of Kyle, EAA, and Ruby Ranch WSC, to evaluate the potential for the Trinity Aquifers as reservoirs for ASR facilities. District staff worked cooperatively with the Ruby Ranch WSC to conduct a fourth and final phase of ASR pilot testing. A status report is currently being prepared.

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 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 the Objective 1-2 Performance Standard update.

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 will submit its first annual report to USFWS in February 2020.

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 2019 began with a status of Stage II Alarm Drought declared by the Board on July 12, 2018. An average of 13 inches of rain in September to October provided much needed recharge to the Edwards and Trinity Aquifers. These rains revived aquifer water levels and Barton Springs flow, elevating to above Stage II Alarm drought warning levels. The Board subsequently updated the drought status from Stage II Alarm Drought to NO Drought on October 15, 2018. The calendar year ended with some of the wettest December weather ever recorded. By New Year's Eve, six inches of rain had fallen in Austin and the Hill Country for the month of December, more than two times the average. January 2019 provided about 3 additional inches, exceeding its historical average of 1.9 inches.

A combined 14 inches of spring rain fell in May and June 2019 providing even more recharge. Barton Springs flow quickly responded to the fall 2018 rains and additional spring 2019 rains to maintain an average daily spring flow of 100cfs throughout FY 2019. On June 14, 2019, water level measurements in the Lovelady monitor well had risen to surpass the third highest peak recorded in 2003 (536.0 ft-msl or 117.4 ft-dtw).

Summer came with a drying trend. Below-average rainfall initiated a rapid decline at the Lovelady well beginning July 15, 2019. This decrease has continued through a dry fall season and

is projected through the winter. The total annual discharge is 19,920 cfs or average daily discharge of 54.58 cfs.

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 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 the Objective 1-2 Performance Standard update.

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 will submit its first annual report to USFWS in February 2020.

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 8-2 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 9, in FY 2019 a technical subcommittee, including District staff, prepared a proposed common methodology to track water levels for DFC compliance. The proposed methodology will require each GCD to maintain a summary spreadsheet for each aquifer. It was further proposed that every five years, in the GMA 9 Explanatory Report, the GCDs could combine these individual results by using the location of each well to produce a grid of the monitored drawdowns resulting in an average monitored

drawdown throughout GMA 9 for each aquifer. A summary of these drawdowns will be provided to each GCD.

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. In FY 2019, District staff developed and discussed a proposal to modify this DFC expression with the goal to establish a means for measuring compliance. The District presented and discussed this proposal at three GMA 10 meetings, a District-hosted meeting with neighboring GCDs, and with the TWDB. District staff will present the proposal to the Board in early FY 2020, and could potentially refine the DFC expression.

For the Freshwater Edwards, Northern Subdivision in GMA 10, in the beginning of the fiscal year about 13 inches of rain between September 1, 2018 and October 30, 2018 provided much needed recharge to the Edwards and Trinity Aquifers. These rains revived aquifer water levels and Barton Springs flow, elevating to above Stage II Alarm drought warning levels. The Board subsequently updated the drought status from Stage II Alarm Drought to NO Drought on October 11, 2018. The calendar year ended with some of the wettest weather ever recorded and by New Year's Eve, six inches of rain had fallen in Austin - more than two times the average. An additional three inches of rain fell in January 2019 exceeding its historical average of 1.9 inches.

A combined 14 inches of spring rain fell in May and June 2019 providing even more recharge. Barton Springs flow quickly responded to the fall 2018 rains and additional spring 2019 rains to maintain an average daily spring flow of 100cfs throughout FY 2019. On June 14, 2019, water level measurements in the Lovelady monitor well had risen to surpass the third highest peak recorded in 2003 (536.0 ft-msl or 117.4 ft-dtw). Summer came with a drying trend and below-average rainfall initiated a rapid decline at the Lovelady well beginning July 15. This decrease has continued through a dry fall season and is projected through the winter.

With this stated, the average daily springflow at Barton Springs over the 84 months from September 1, 2013 to August 31, 2019 was 82 cfs. The DFC expression is springflow at Barton Springs during average recharge conditions shall be no less than 49.7 cfs over an 84-month period.

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.

Appendix D

Meeting Minutes (1/28/2020) of Management Advisory Committee

BSEACD Habitat Conservation Plan
Management Advisory Committee List of Members
January 2020

Sign In	EMAIL	Organization
Cindy Loeffler	cindy.loeffler@tpwd.texas.gov	Texas Parks and Wildlife Department
Jennifer Walker	WalkerJ@nwf.org	Environmental Community-National Wildlife Federation
Nathan Bendik NB present	Nathan.bendik@austintexas.gov	Salamander biologist-COA Watershed Protection Department
Blake Neffendorf	bneffendorf@ci.buda.tx.us	PWS permittee-City of Buda
Scott Nester	nester4family@yahoo.com	Property Owner in District - Aquifer-using Landowner)
Christy Muse	christymuse@shieldranch.com	Private Property/Conservation – Shields Ranch
Susan Meckel	smeckel@lcra.org	River Authority- Lower Colorado River Authority
Jon White Clifton	jon.white@traviscountytx.gov	County Government – Travis Co
~~Cliff~~ Ladd	clifton.ladd@blantonassociates.com	Interested Private Citizen (Public At-Large)
Dr. Ben Hutchins	Bh1333@txstate.edu	Technical/Ecological expert
Dr. Brian Smith BS Present	brians@bseacd.org	BSEACD Technical staff
Tanya Sommer	tanya_sommer@fws.gov	USFWS Representative (non-voting)
Christina Williams	Christina_williams@fws.gov	USFWS Representative (non-voting)
Laurie Dries	ldries@mac.com	Salamander expert and former chair of the MAC
Dr. Jack Sharp	jmsharp@jsg.utexas.edu	Hydrogeologist

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

Buda City Hall Meeting Room
January 28, 2020, 1-3pm

Management Advisory Committee (MAC) members present at commencement: Cindy Loeffler, Jennifer Walker, Nathan Bendik, Blake Neffendorf, Scott Nester, Christy Muse, Susan Meckel, Jon White, Clifton Ladd, Dr. Ben Hutchins, and Laurie Dries. Staff present included: Vanessa Escobar, Dr. Brian Smith, Kendall Bell-Enders, Brian Hunt, Justin Camp, Jackie Vay, Erin Swanson, and Robin Gary. These minutes represent a summarized version of the meeting and feedback/comments from the MAC (provided verbally during the meeting and through email); the complete discussion during the meeting was recorded digitally.

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.

1. Background of the MAC

Dr. Smith explained the purpose of the MAC meeting at least annually to receive and review the District's annual progress report and associated other documentation pertaining to the ITP. The HCP MAC's role is to advise and assist the Board in the coordination of conservation activities affecting Covered Species at Barton Springs and ensure continued improvement of the HCP and compliance with the ITP.

2. Description of Covered Activities

Ms. Escobar described the two main types of covered activities (pertaining to groundwater withdrawals and managing species habitat) and how they are directly related to TWDB Goals documented through the District's Management Plan.

3. Groundwater Withdrawals

Ms. Escobar illustrated how the 33 Management Plan objectives are tied to the 25 HCP minimization measures, 5 HCP mitigation measures and 2 HCP research measures. She reviewed the Edwards drought management strategies and explained the Extreme Drought Withdrawal Limits that would protect springflow and habitat. Drought pumpage reductions were in effect for one month during FY2019 and permittees exceeded their drought compliance targets.

4. HCP Expenditures

Ms. Escobar reviewed HCP Expenditures for FY2019, explaining that because all District activity was related to fulfilling the Management Plan objectives, and therefore also the HCP measures, all expenditures are considered towards HCP Implementation Activities.

5. Status of the Aquifer

Dr. Smith discussed recorded groundwater levels in the Lovelady monitor well and springflow and dissolved oxygen levels at Barton Springs for the reporting period.

6. Estimated Annual Take

Dr. Smith presented the estimated annual take based on 8 days of hybrid drought.

7. Mitigation and Research Measures: What's Next

Dr. Smith reviewed status and future plans for DO feasibility studies, installation of monitor wells, possibility of DO augmentation near Barton Springs, groundwater modeling, dye-trace studies, and water quality studies.

8. Comments and Feedback – Q&A

MAC members provided feedback verbally during the meeting and Laurie Dries, Susan Meckel, and Ben Hutchins submitted written feedback via email. The following is a summary of all MAC comments.

General procedure, report structure

- Provide an interim status update(s) throughout the year, so MAC doesn't have to wait until the year-end report to catch up on all the activities.
- Consider adding an executive summary discussing the purpose and findings of the report, especially how it differs from the Management Plan report.
- Add a table that presents basic completion/partially complete/not complete status and a brief explanation or reference where to find more detail. This would make it easy to track progress over the years.
- Review use of acroynms/abbreviations to be sure to define the first time they are used.
- It would be helpful to add estimated timeline on some of the activities. Could just be general estimate like "in the next few years" or next year, etc.
- Add context to minimize the number of times the reader has to refer to another report or appendix.
- Show drought thresholds or periods of declared drought--where possible--to hydrographs, charts, and timelines to help provide context.
- All the right info is in the report, just needs help for the reader to tie it together. Good job! This is hard stuff and even 6 years into the EAA HCP, they're still refining the annual report.

Pumpage numbers

- Wanted to better understand how annually the permittees actually pump 58% of their permitted amount, and why during the September drought curtailment only resulted in 43% less than permitted. He pointed out this doesn't seem like successful behavior change, but it may just be how it was presented.
- Add a time series of pumpage tracking over the years. Pumpage context would be helpful to understand how effectiveness of the drought declarations. It would also help to show how actual annual % pumpage compare over the years and seasonally.
- It would be useful to show/expand on the behavior change, response to curtailments, and effectiveness of the drought management activities to measure confidence in that permit compliance (especially during droughts) to reach management goals.
- It would be helpful to add explanation of how exempt well production is estimated.
- Can you separate out use type (domestic, pws, irrigation, industrial)? That would be interesting to see. How much is currently in the ecological flow reserve? That would be a cool thing to track as it grows through the course of the ITP.

<u>Take estimate comments:</u>

- Explain conditions A, B, and C in take table and characterize drought (non-drought, severe etc) as it relates to the modeled droughts that we derived the total take from.
- State the type of take experienced and indicate the relative % of A+B vs C to describe in a general way the corresponding behavioral vs potential physiological take.
- Add the CoA's recent information on populations to the appropriate section.
- Section 10.0 states salamander populations 'remained stable' and in the next sentence talks about low abundance especially recruitment and reproduction compared to prior years. That doesn't sound stable to me. Consider changing the wording or adding some additional explanation about how populations can be stable but less abundant than in previous years.
- Applauded the fact that we reported 8 days of take and appreciated that we didn't discount it as being so small to not count.
- Update reference to CoA's salamander population report.