Environmental Stewardship
A Sustainable Ecosphere

WATERKEEPER® ALLIANCE AFFILIATE

May 28, 2023

Ms. Laurie Gharis
Chief Clerk
Texas Commission on Environmental Quality
MC-105
P.O. Box 13087
Austin, Texas 78711-3087

VIA ELECTRONIC FILING

RE: Corix Utilities (Texas) Inc., McKinney Roughs Permit Application WQ0013977001 - PFAS Compounds in River/Tributary and Review of Integrated Assessments of Segment 1428.

Dear Ma. Gharis:

These comments on the above referenced application are submitted on behalf of Environmental Stewardship and its members.

Environmental Stewardship requested that a public meeting be held to assure it and others have adequate information and time to submit comments prior to TCEQ's final decision regarding whether to grant the proposed draft permit. Environmental Stewardship reserves its right to a contested case hearing contingent on resolving all issues raised herein resulting from the application and draft permit.

The initial comments of Environmental Stewardship were provided on May 4, 2023. Additional comments are being provided herein.

Environmental Stewardship is requesting that:

- PFAS compounds be limited in this wastewater permit to the extent possible and that the applicant be required to identify sources of these compounds, monitor, and determine whether treatment technology is available to remove them the wastewater discharged.
- TCEQ provide a review of best-available wastewater treatment technology necessary to meet the exceptional aquatic life use, recreational, and drinking water standards that apply to Segment 1428 of the Colorado River, and to require such standards be used in this permit. Consideration of centralized, decentralized and water resource recovery options should be included in cooperation with the City of Bastrop and Bastrop County.
- TCEQ provide any such data as are available that would justify their determination that this segment is, or is not, meeting the Exceptional Aquatic Use standards.
- TCEQ conduct, prior to making a final decision regarding this permit, such biological assessment studies as are necessary to not only adequately assess, but to take remedial actions where needed to reverse the degradation of this segment of the river.

- TCEQ provide copies of the anti-degradation reviews on the receiving waters (Tier 1 and 2), and the studies that underlay these reviews. Environmental Stewardship further requests that this determination be reexamined and modified after appropriate studies have been conducted to determine the current status of impaired fish and macrobenthic communities resulting from nitrogen, phosphates, and other impairments in the segments 1428, including the level of PFAS contamination.

Environmental Stewardship is a Texas non-profit that works to protect the Colorado River, Matagorda Bay, and the Carrizo-Wilcox Aquifer group in the lower basin. Environmental Stewardship has members who own property near and downriver from the McKinney Roughs wastewater discharge. Environmental Stewardship also has members who have drinking water and/or irrigation wells in the Colorado Alluvial Aquifer and adjacent aquifers downriver from the proposed discharge, who would be adversely affected by the proposed 10-fold increase in wastewater discharge. Moreover, Environmental Stewardship is concerned about the overall ecological health of the Colorado River, its tributaries, and the aquifers of the region.

PFAS COMPOUNDS FOUND IN THE COLORADO RIVER AND TRIBUTARIES BELOW AUSTIN

Environmental Stewardship has been conducting a field sampling project to estimate the extent to which the surface and groundwaters of lower Travis County and Bastrop County and are contaminated by per- and polyfluoroalkyl substances (PFAS)[1]. To date these compounds have been detected in the Colorado River, many of its tributaries, and the Colorado Alluvial Aquifer. Additional samples have been taken in lower Travis County and groundwater wells in Bastrop County that will be available in the near future.

Figures 1 and 2 summarize the findings to-date. Each sample was analyzed by Cyclopure for 55 PFAS compounds. The result of each analysis is found in Attachment 1.

Figure 1 shows the concentration (parts per trillion, ppt, ng/L) of PFOA, PFOS, and Total PFAS compounds found at Webberville, Wilbarger Bend, McKinney Roughs, Utley Bridge, Bastrop (below the Wastewater Treatment Plant), and Smithville. This figure also shows the concentration in the Colorado Alluvial Aquifer at Wilbarger Bend.

The Environmental Protection Agency is proposing that PFOA and PFOS be limited[2] in drinking water to 4.0 ppt. The concentration of PFOA compound was detected above the 4.O ppt proposed limit in all river samples except in the Bastrop location. PFOS compound was above the proposed limit at Wilbarger Bend, McKinney Roughs, Utley bridge and Smithville.

[1] https://www.environmental-stewardship.org/PFAS-FOREVER-CHEMICALS-IN-TEXAS-COLORADO-RIVER/
[2] https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas

PFAS Contamination

PFAS Compounds in the Colorado River Basin
Austin to Smithville, TX.

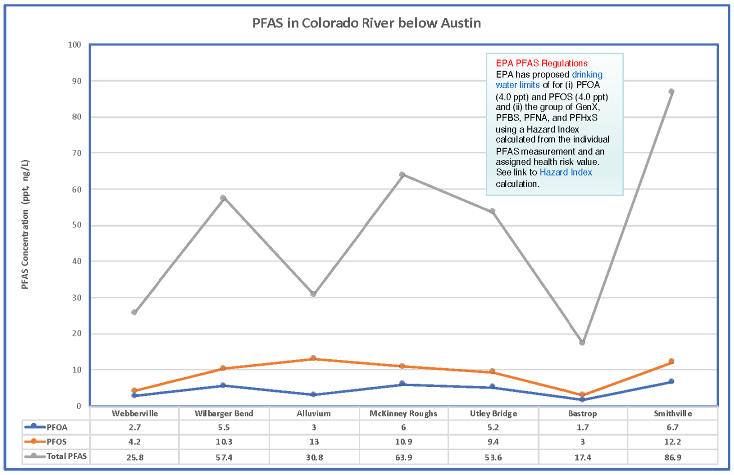


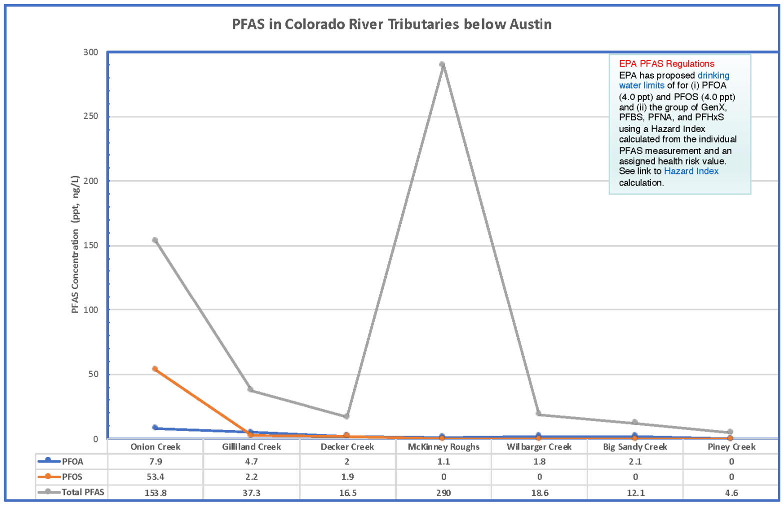
Figure 1. PFAS Compounds in the Colorado River below Austin.

Figure 2 shows the concentration (parts per trillion, ppt, ng/L) of PFOA, PFOS, and Total PFAS compounds found in Onion Creek, Decker Creek, Gilliland Creek, unnamed creek at McKinney Roughs, Wilbarger Creek, Big Sandy Creek, and Piney Creek tributaries to the Colorado River.

This figure shows that Onion Creek and the unnamed tributary at McKinney Roughs have the highest concentration of PFAS compounds. The concentration of PFOA compound was detected above the 4.O ppt proposed limit in Onion Creek and Gilliland Creek. PFOS compound was above the proposed limit in Onion Creek.

Perfluoropentanoic acid (PFPeA) was the primary compound detected in the unnamed tributary to the Colorado River in McKinney Roughs. Perfluoropentanoic acid is a monocarboxylic acid that is perfluorinated pentanoic acid. It has a role as an environmental contaminant and a xenobiotic. It is functionally related to a valeric acid. PFPeA is a breakdown product of stain- and grease-proof coatings on food packaging, couches, and carpets, including Stainmaster.

PFAS Compounds in the Colorado River Basin
Austin to Smithville, TX.



	Onion Creek	Gilliland Creek	Decker Creek	McKinney Roughs	Wilbarger Creek	Big Sandy Creek	Piney Creek
PFOA	7.9	4.7	2	1.1	1.8	2.1	0
PFOS	53.4	2.2	1.9	0	0	0	0
Total PFAS	153.8	37.3	16.5	290	18.6	12.1	4.6

Figure 2. PFAS Compounds in Colorado River Tributaries below Austin

Environmental Stewardship is concerned that PFAS compounds are ubiquitous throughout the Colorado River basin below Austin. Though regulatory actions have not been finalized at a federal or state level, it is evident that attention needs to be brought to this situation and actions be taken where possible to start remedial actions to remove or eliminate the compounds from both surface and groundwater where possible. As such, Environmental Stewardship is requesting that these PFAS compounds be limited in this wastewater permit to the extent possible and that the applicant be required to identify sources of these compounds, monitor, and determine whether treatment technology is available to remove them the wastewater discharged.

IS THE WASTEWATER TREATMENT PROPOSED ADEQUATE TO MEET EXCEPTIONAL AQUATIC LIFE USE STANDARD FOR SEGMENT 1428 OF THE COLORADO RIVER?

The health of a river — an ecological system which functions as a massive water filter —required that best-available treatment technology be used in order to meet *exceptional* aquatic-life use standards.

Depending on the health of a stream, and how it is managed to maintain its ecological health, it is able to assimilate some amount of pollution by neutralizing the impact of the pollution as the stream breaks down the pollutant as it flows through the environment. As you might expect, a healthy stream can carry and treat a larger "load" of pollution than a stream that is ecologically stressed. This is what is called a stream's "assimilative capacity".

The assimilative use of a stream or river to removed pollutants must be balanced with the other uses of the stream, such as for recreation, drinking-water supply, and, in the case of Segment 1428 of the Colorado River, *exceptional aquatic-life use*.

The amount of pollutant *load* that a stream can handle, while also providing the beneficial recreational, drinking-water supply and exceptional aquatic-life use, must be managed by *limiting* the amount of total pollution load that is allowed to be disposed of in the stream. This is done in the permitting process and, where needed, by a management process called Total Maximum Daily Loading (TMDL).

The TCEQ is the agency of the state that has been delegated the authority under the federal Clean Water Act to manage this balancing of beneficial uses in Texas.

The starting place in managing the balance between the beneficial uses of a stream or river is a periodic "*health assessment*". Just like we get a periodic health checkup to assess how our body is functioning -- whether it is compromised by disease or poor diet -- a stream needs to be *assessed* to determine whether it is meeting the standards that have been set for it, or if it is in some way *impaired*. If it is impaired and cannot manage the pollution load that has been placed on it, then, by law, a Total Maximum Daily Load limit must be determined, and a management plan established, to remedy the impairment and return the stream to a healthy status.

Again, the TCEQ is the agency that has been delegated the responsibility to do periodic assessments of the water quality and ecological health of Texas rivers, streams, and lakes. *See our concerns discussed below regarding impaired Fish and Macrobenthic communities.*

Unfortunately, all treated wastewater is not the same quality when it is discharged through an outfall and into a stream or river, or through land application such as a sprayfield.

Some wastewaters may be treated to very high standards using current best-available technology, whereas other wastewater may be treated to lower, often old, standards that may have once been "best-available". Often, the capacity of an older plant is expanded, but continues to use the old treatment technology. Sometimes, in a best case scenario, an older plant is also modernized with better technology when it is expanded.

Package Plants

Package plants, like being proposed for use by Corix/McKinney Roughs, are pre-manufactured treatment facilities used to treat wastewater in small communities or on individual properties.

Here is what the EPA[3] says about package plants:

Disadvantages

While package plants have some advantages for small scale operations, they also have disadvantages dependent on process types:

- Extended aeration plants do not achieve denitrification or phosphorus removal without additional unit processes.
- A longer aeration period requires more energy.

[3] United States Environmental Protection Agency, Wastewater Technology Fact Sheet Package Plants, EPA 832-F-00-016 September 2000

- Systems require a larger amount of space and tankage than other "higher rate" processes, which have shorter aeration detention times.
- It is hard to adjust the cycle times for small communities.
- Post equalization may be required where more treatment is needed.
- Sludge must be disposed frequently.
- Specific energy consumption is high.
- Oxidation ditches can be noisy due to mixer/aeration equipment and tend to produce odors when not operated correctly.
- Biological treatment is unable to treat highly toxic waste streams.
- Some systems have a relatively large footprint.
- Systems have less flexibility should regulations for effluent requirements change.

Performance

The performance of package plants in general can be affected by various operational and design issues (Metcalf and Eddy, 1991).

- Large and sudden temperature changes
- Removal efficiency of grease and scum from the primary clarifier (except with oxidation ditches that do not use primary clarifiers)
- Incredibly small flows that make designing self-cleaning conduits and channels difficult
- Fluctuations in flow, BOD_5 loading, and other influent parameters
- Hydraulic shock loads, or the large fluctuations in flow from small communities
- Sufficient control of the air supply rate

Operation and Maintenance

Operation requirements will vary depending on state requirements for manning package treatment systems. Manning requirements for these systems may typically be less than eight hours a day. Each type of system has additional operational procedures that should be followed to keep the system running properly.

Owners of these systems must be sure to follow all manufacturer's recommendations for routine and preventative maintenance requirements. Each owner should check with the manufacturer to determine essential operation and maintenance (O&M) requirements.

Depending on state requirements, most systems must submit regular reports to local agencies. In addition, system operators must make safety a primary concern. Wastewater treatment manuals and federal and state regulations should be checked to ensure safe operation of these systems.

Centralized, Decentralized, or Water Resource Recovery?

The higher level discussions around the best wastewater treatment options seems to be around whether to continue with large, centralized wastewater treatment facilities, or to adopt a decentralized approach. Woven through the discussion is how to bring water resource recovery and reuse into play.

It appears that the Environmental Protection Agency is leaning toward a more decentralized approach that includes water, nutrient, and energy recovery and reuse. The Water Research Foundation said it this way: "Used water, which was previously thought of as waste, is now seen as a valuable source for highly commoditized resources -- including **N**utrient, **E**nergy and clean **W**ater"; **Re-N-E-W-able Resources.**

These are issues that have also been raised regarding Corix/McKinney Roughs permit applications. The question is: how do we bringing innovative solutions to these situations, rather than continuing to look at wastewater as a by-product to be disposed of on our land or into our river?

Environmental Stewardship is concerned that the treatment standards proposed for disposal of treated industrial and municipal wastewater in this segment of the Colorado River are not adequate to maintain the exceptional aquatic life use. As such, Environmental Stewardship is requesting that TCEQ provide a review of best-available wastewater treatment technology necessary to meet the exceptional aquatic life use, recreational, and drinking water standards that apply to Segment 1428 of the Colorado River, and to require such standards be used in this permit. Consideration of centralized, decentralized and water resource recovery options should be included in cooperation with the City of Bastrop and Bastrop County.

IMPAIRED FISH AND MACROBENTHIC COMMUNITY CONCERNS FOR SEGMENT 1428 OF THE COLORADO RIVER

It has become clear to persons that use and recreate on this reach of the river that the water quality and ecology of the Colorado River below Austin are likely impaired. Two segments (1428 and 1434), that have the highest aquatic and recreational use standards in the state, appear to be falling short of meeting the standards set in the 1980's and early '90's, and updated in 2018. (TAC, Title 30, Chapter 307.10(1), Appendix A - pages 29-31.)

Environmental Stewardship *strongly* objects to the statement by TCEQ that Segment No. 1428 of the Colorado River is not currently listed on the State's inventory of impaired and threatened waters (the 2022 CWA § 303(d) list) in its Notice of Application and Preliminary Decision for TPDES Permit for Municipal Wastewater[4] because this statement seeks to imply that this segment is not impaired or threatened waters, and therefore meets the criteria to accept disposal of treated wastewater into the River. To the contrary, the evidence shows that concerns were initially raised about impairment of fish and macrobenthic communities in the 2002 Texas Integrated Report on the Colorado River Basin[5] along with nutrients nitrogen and phosphate. However, it also appears that very little has been done to further investigated or otherwise address these concerns since their initial listing.

In reviewing the 2020 Texas Integrated [Assessment] Report[6] for the Colorado River (Basin 14) it is clear that impaired fish and macrobenthic communities in these segments of the river were once

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[4] NOTICE OF APPLICATION AND PRELIMINARY DECISION FOR TPDES PERMIT FOR MUNICIPAL WASTEWATER TPDES, Permit No. WQ0013977001, Deba Dutta, P.E.12/16/2022.

[5] 2002 Fact Sheet: Colorado River Below Town Lake, Segment 1428, page 1; 2002 Water Quality Data , pages 1 and 4; Streams and Rivers Use Support Assessment, pages 8-46 and 8-52. These parameters were not listed as a concern in the 2000 Texas Water Quality Inventory.

[6] The Texas Integrated Report describes the status of the state's waters, as required by Sections 305(b) and 303(d) of the federal Clean Water Act. It summarizes the condition of the state's surface waters, including concerns for public health,

again carried over without evidence of biological assessments having been conducted for these concerns. Methods[7] for collecting and analyzing biological assemblage and habitat data provides metrics for evaluating fish and benthic communities for exceptional aquatic use for ecoregions, including that of Segment 1428. However, we are unable to find references to any recent data that has been collected that indicates that this segment is fully supporting, or not supporting, this standard of use. As such, we are requesting that TCEQ provide any such data as are available that would justify their determination that this segment is, or is not, meeting the Exceptional Aquatic Use standards.

Environmental Stewardship asserts that segment 1428 is impaired according to the 2020 and 2010, 2008, and 2006 Texas Integrated Reports, and likely should be on the 303(d) list of impaired streams where it would be subject of a management strategy to remedy the impairments.

Unless the TCEQ is able to provide adequate evidence to justify that Segment 1428 is fully supporting the Exceptional Aquatic Use standard, Environmental Stewardship requests that the TCEQ conduct, prior to making a final decision regarding this permit, such biological assessment studies as are necessary to not only adequately assess, but to take remedial actions where needed to reverse the degradation of this segment of the river.

In addition, Environmental Stewardship, is requesting copies of the anti-degradation reviews on the receiving waters (Tier 1 and 2), and the studies that underlay these reviews. Environmental Stewardship further requests that this determination be reexamined and modified after appropriate studies have been conducted to determine the current status of impaired fish and macrobenthic communities resulting from nitrogen, phosphates, and other impairments in the segments 1428, including the level of PFAS contamination.

Environmental Stewardship's overall goal is protection of the exceptionally high-quality waters of the Colorado River in this segment, and groundwater aquifers that exchange water with the river. The draft permit proposed by TCEQ raises many concerns in addition to those raised in these comments. Lacking adequate time and documents, we have limited our comments to those of greatest concern.

Thank you for your consideration. If you have any questions regarding these comments, please feel free to contact me.

Sincerely,

Steve Box
Executive Director
Environmental Stewardship
Executive.Director@envstewardship.org

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fitness for use by aquatic species and other wildlife, and specific pollutants and their possible sources. https://www.tceq.texas.gov/waterquality/assessment/20twqi

[7] Surface Water Quality Monitoring Procedures, Volume 2, Appendix B (RG-416, Revised May 2014)

ATTACHMENT 1 - ISSUSES LIST
ATTACHMEMT 2 - PERMIT & BEDC MAP OF CITY OF BASTROP ETJ EXPANSION
ATTACHMENT 3 - PFAS SURFACE WATER MONITORING REPORT

CC: Mr. Troy Hotchkiss, P.E., Integrated Water Services, Inc., thotchkiss@integratedwaterservices.com
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Senator Charles Schwertner, District 5 Charles.Schwertner@senate.texas.gov
Representative Stan Gerdes, District 17 Stan.Gerdes@house.texas.gov

Environmental Stewardship is a nonprofit organization whose purposes fall under the following categories: Public Policy - Aiming to protect, conserve, restore, and enhance the earth's natural resources in order to meet current and future needs of the environment and humans; Science & Ecology - Gathering and using scientific information to restore and sustain ecological services provided by environmental systems; and Outreach & Education - Providing environmental education and outreach that encourages public stewardship. We are a Texas nonprofit 501(c) (3) charitable organization. For more information visit our website at http://www.environmental-stewardship.org/.

ATTACHMENT 1

PFAS Compounds in the Colorado River Basin below Austin

May 5, 2023

Environmental Stewardship

PFAS Compounds in the Colorado River Basin Below Austin

May 5, 2023

Environmental Stewardship
info@envstewardship.org

Introduction

Environmental Stewardship (ES) is an environmental non-profit in the Bastrop, TX area which conducts environmental research to inform policy and decision-making in Texas. In December 2022, ES conducted a preliminary test of surface water contamination of per-and polyfluoroalkyl substances (PFAS) in the Colorado river and its tributaries. The goal of this study is to ascertain the existence of PFAS contamination and report upon the results to the proper authorities so judgments can be made about the state of our environment and catalyze discussion regarding plans to move forward in a regulatory sense.

PFAS are a widely employed industrial chemical group used to create fluoropolymer coatings and products that resist heat and water, such as non-stick cooking products, clothing, furniture, food packaging, adhesives, and wire insulation. These chemicals do not break down in the environment, rather they are persistent and bioaccumulate in fish and wildlife, and infiltrate soil and water. The nature of their composition and multifunctional use makes them environmentally pervasive and globally widespread. The nature of their composition and bioaccumulation capacity has led to discoveries of the compound in the blood of humans and animals (Domingo, 2019).

Definitive claims about the impact of long-term exposure to PFAS on human health cannot be made as research is currently rudimentary and ongoing (Fenton, 2021). However, the EPA released an updated drinking water Health Advisory1 (HA) about PFAS, for which the results of this study have been framed upon. This new HA states that the advised level of exposure to PFOA and PFOS are .004 ppt2 (ng/L) and .002 ppt (ng/L) respectively3. The EPA is a regulatory agency with enforcement authority. However, the agency has authorized most states by a delegationprocess whereby a memorandum of agreement guides the state in implementing and enforcing federal regulations on a local level. States, however, can independently set limits and enforce limits. Texas Commission on Environmental Quality (TCEQ) has been delegated this authority but has not issued regulatory standards or advisories about PFAS. Therefore, it is necessary for the proper authorities at TCEQ to address the concerns brought forth in this study.

Methods

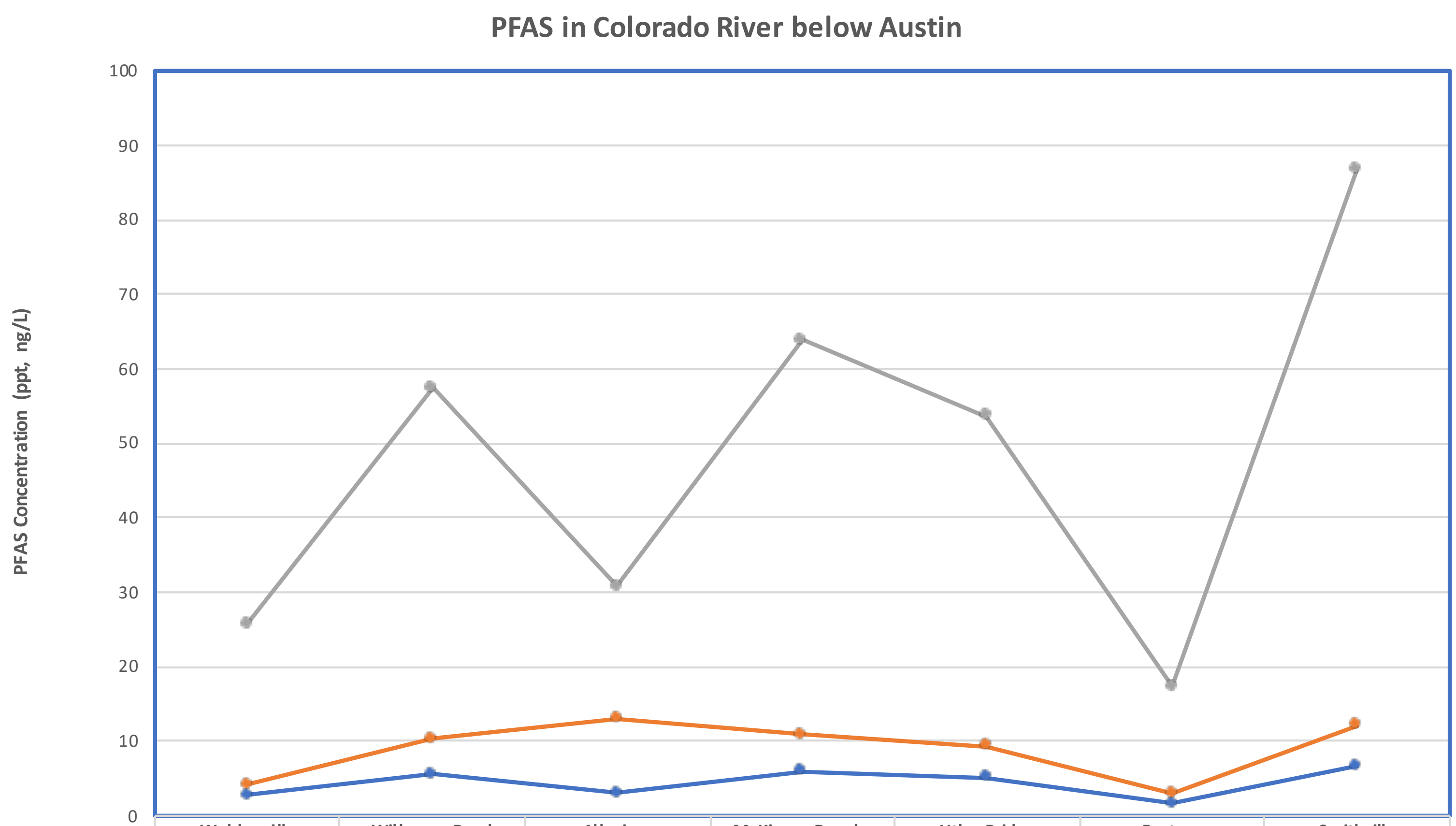
Environmental Stewardship worked with Cyclopure labs for PFAS testing of water samples. All eleven samples discussed in this report were collected with a Cyclopure product called Water Test Kit Pro. These kits do not require the collecting and shipping of large water samples, rather water is filtered through Cyclopure's patented filtration device DEXSORB®. This lab uses an isotope dilution method to determine the existence of 55 PFAS chemicals, including all listed in EPA health advisories. See list at end of this document. Cyclopure is not a certified lab, therefore these results serve as preliminary information and demand further inspection by a certified lab to be considered by state and federal regulatory agencies. For more information on Clyclopure's patented technology and laboratory efficacy,please consult their website.

Samples were collected along the Colorado River and its tributaries in and around Bastrop County. Each sample location was publicly accessible from main roads and did not broach private property (Images 3-5). The directions for use outlined by Cyclopure were followed. Gloves were worn and about 250 ml of water was directly collected into the Cyclopure testing kit. Before collecting the sample from the site, the data card from the test kit was filled out with the appropriate information from the sample location. Sample collection was executed with precaution. The inside of the sample cup was not touched and the blue extraction filter at the bottom of the cup containing the DEXSORB® was not detached or disturbed.

Once all the location and sample data were recorded, water samples were collected directly into the Cyclopure sample cup. When taking the sample, the cup was faced up-stream with little to no disturbance of the river/stream bottom. Each water sample cup was filled to the 250 ml line and the lid was placed directly back onto the cup immediately after the collection of water. Once all collected water was filtered through the testing kit, which took roughly about 15-20 minutes depending on turbidity, they were sealed, labeled, and returned to Cyclopure labsor analysis.

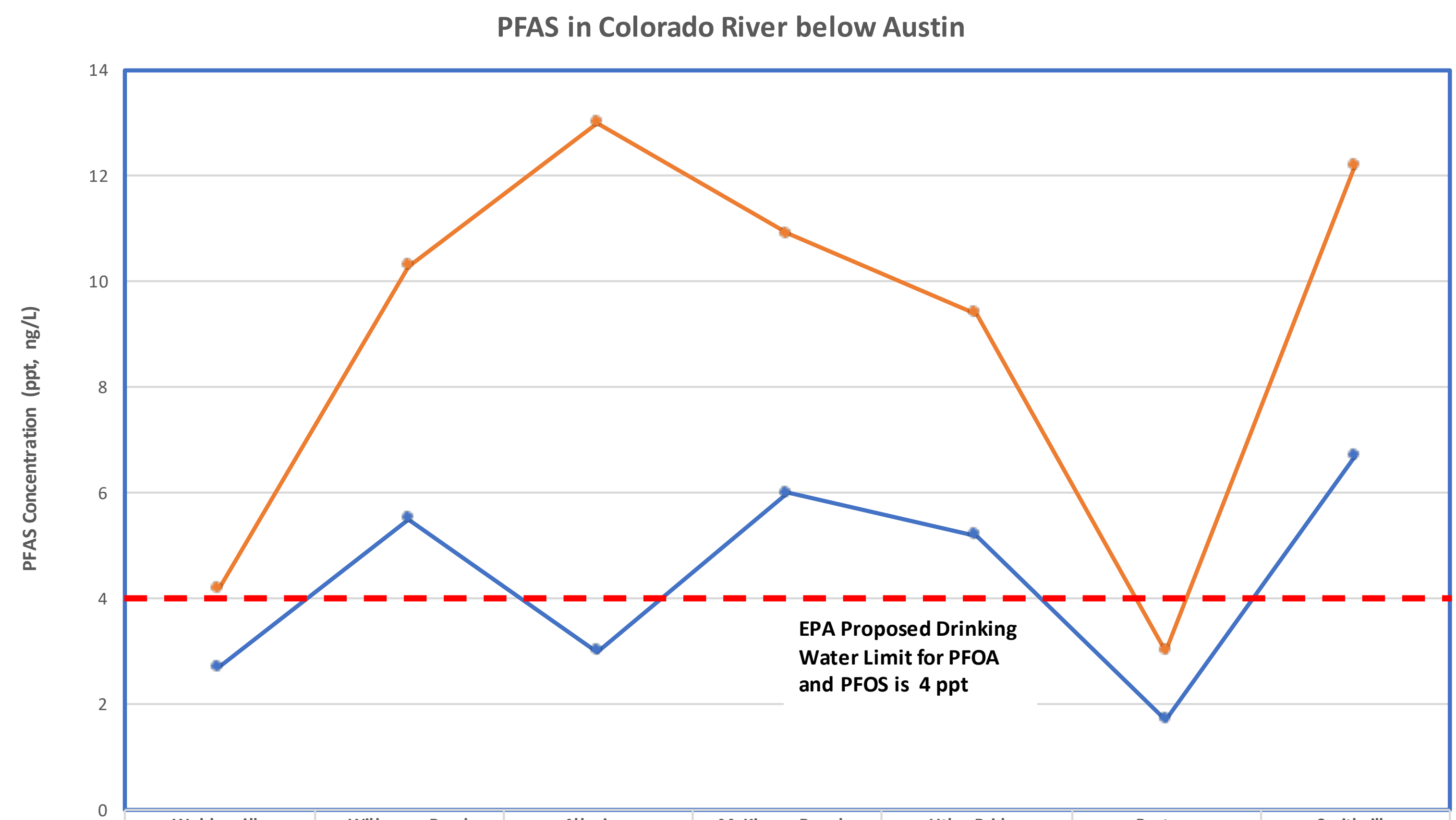
For more information see **: PFAS Contamination in Surface Water Samples taken from the Colorado River and tributaries in Bastrop County**, December 2022 by Molly O'Neil Fisher 02/11/23

PFAS Compounds in the Colorado River Basin
Austin to Smithville, TX.



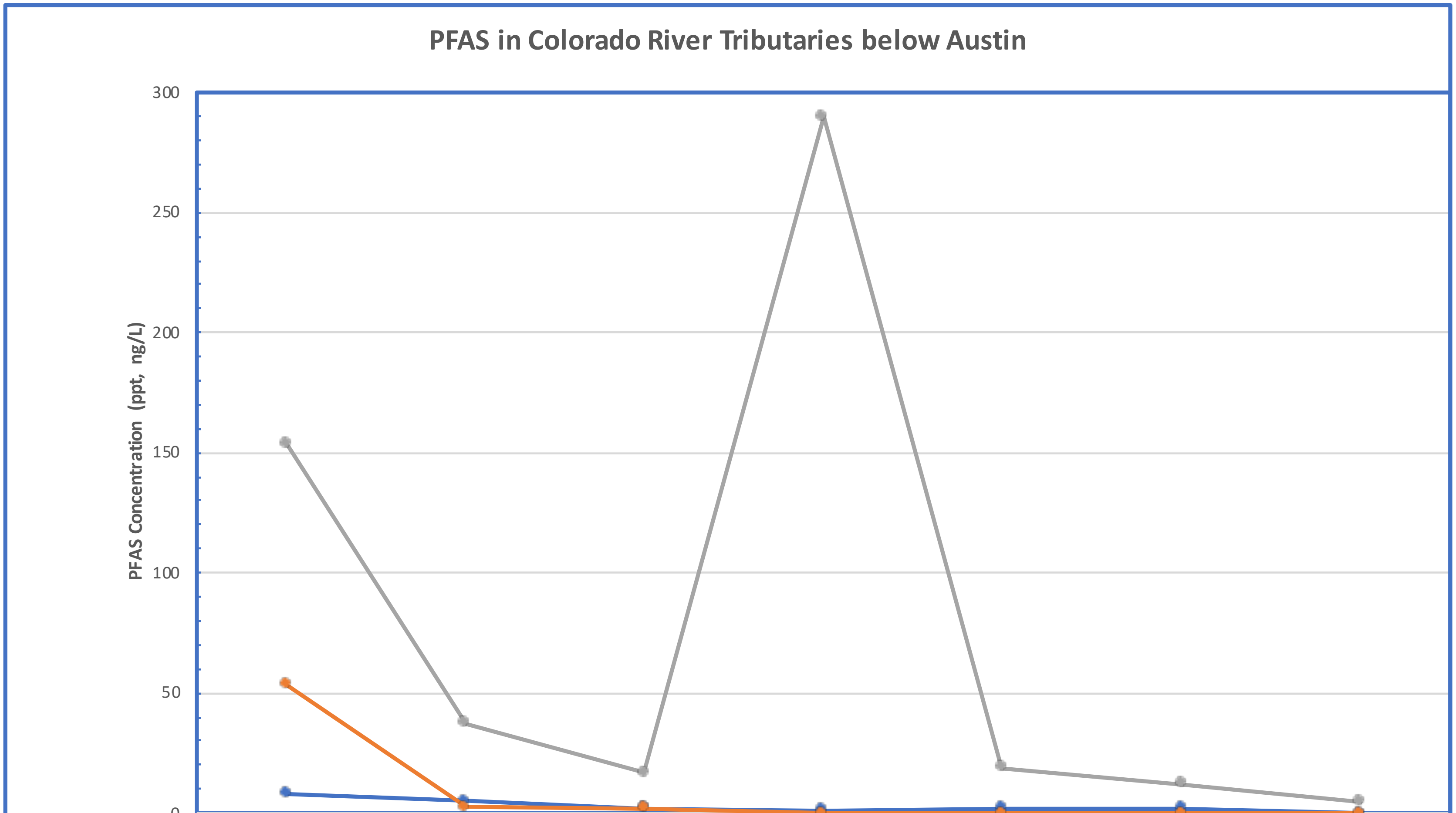
	Webberville	Wilbarger Bend	Alluvium	McKinney Roughs	Utley Bridge	Bastrop	Smithville
PFOA	2.7	5.5	3	6	5.2	1.7	6.7
PFOS	4.2	10.3	13	10.9	9.4	3	12.2
Total PFAS	25.8	57.4	30.8	63.9	53.6	17.4	86.9

PFAS Compounds in the Colorado River Basin
Austin to Smithville, TX.



	Webberville	Wilbarger Bend	Alluvium	McKinney Roughs	Utley Bridge	Bastrop	Smithville
PFOA	2.7	5.5	3	6	5.2	1.7	6.7
PFOS	4.2	10.3	13	10.9	9.4	3	12.2

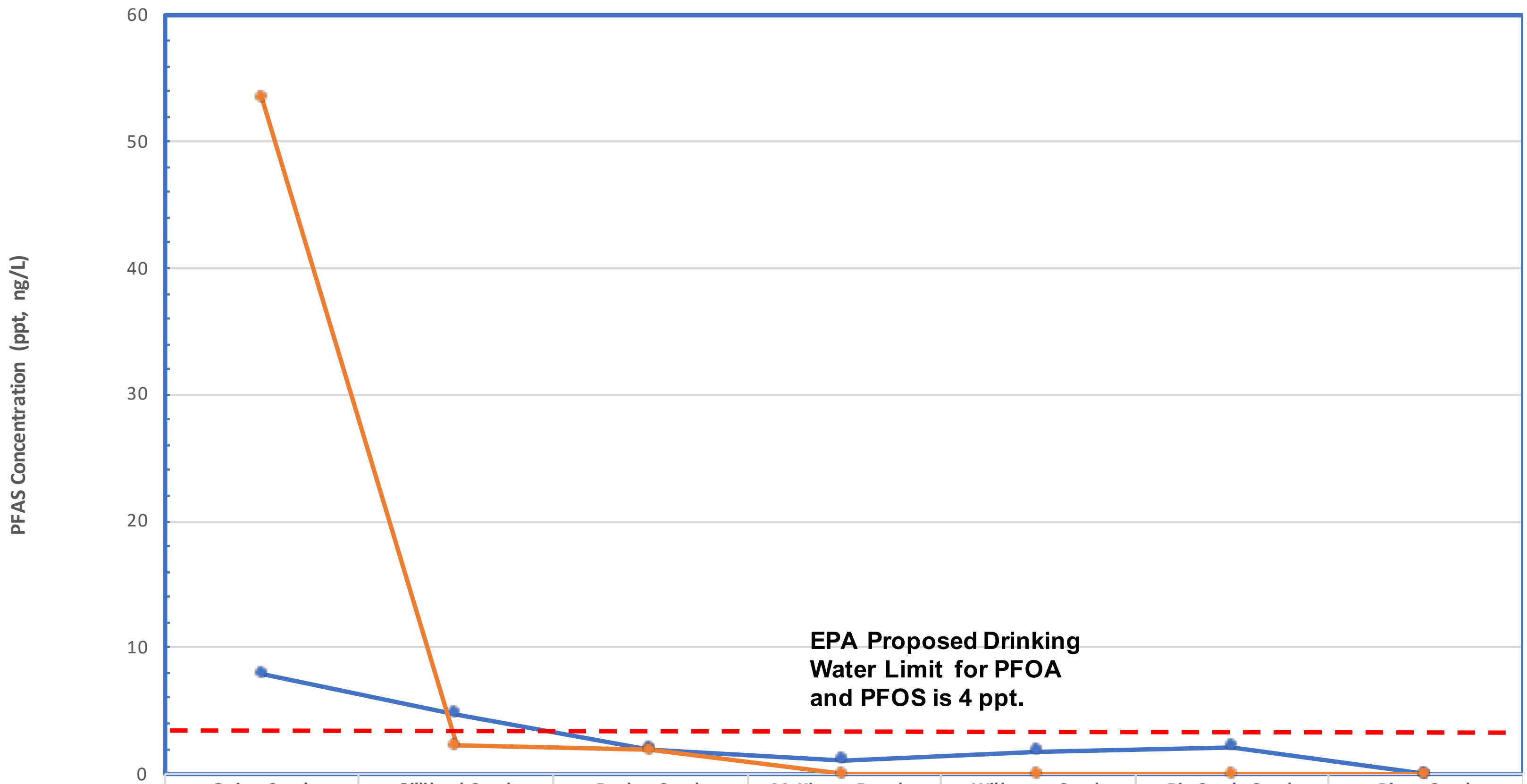
PFAS Compounds in the Colorado River Basin
Austin to Smithville, TX.



	Onion Creek	Gilliland Creek	Decker Creek	McKinney Roughs	Wilbarger Creek	Big Sandy Creek	Piney Creek
PFOA	7.9	4.7	2	1.1	1.8	2.1	0
PFOS	53.4	2.2	1.9	0	0	0	0
Total PFAS	153.8	37.3	16.5	290	18.6	12.1	4.6

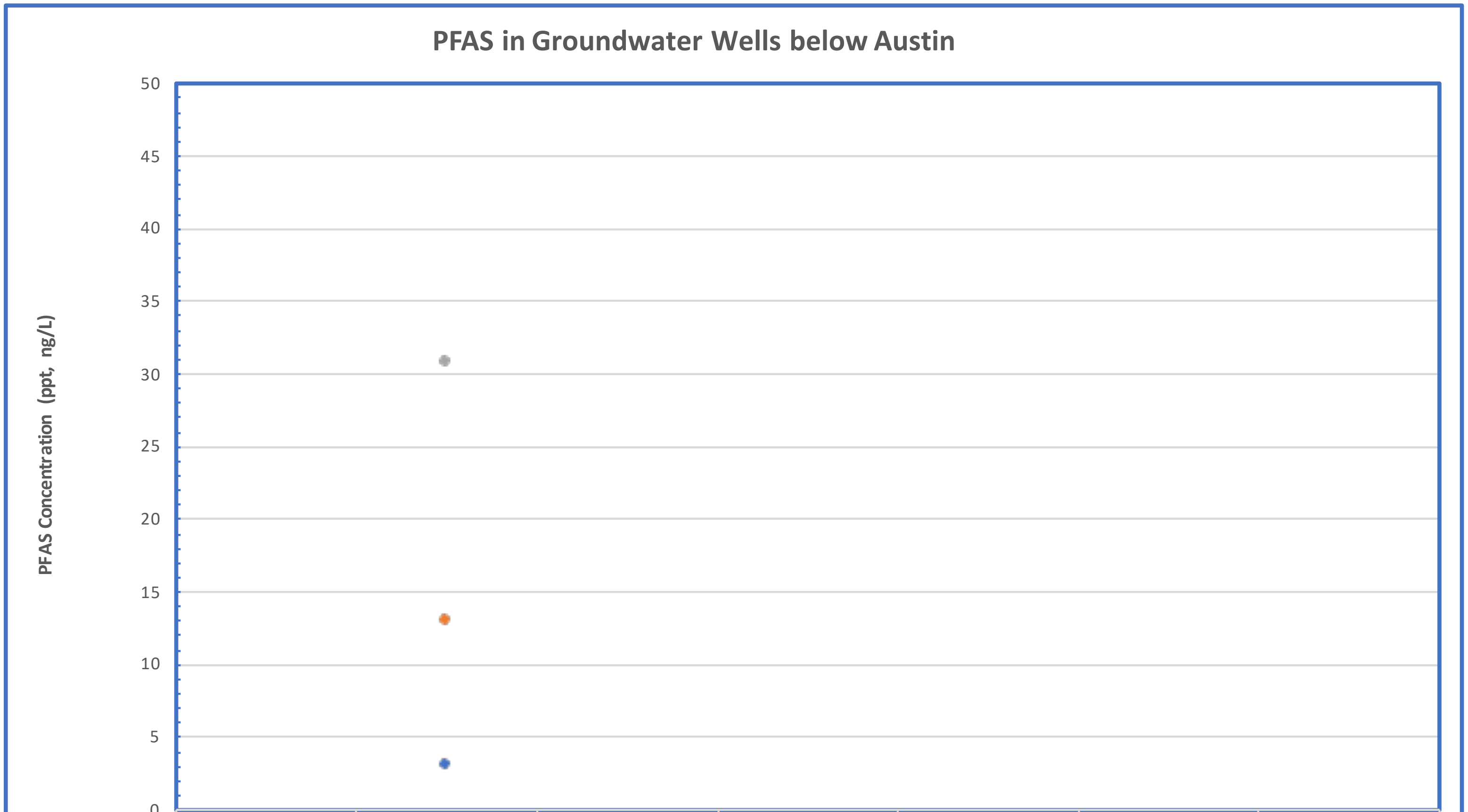
PFAS Compounds in the Colorado River Basin
Austin to Smithville, TX.

PFAS in Colorado River Tributaries below Austin



	Onion Creek	Gilliland Creek	Decker Creek	McKinney Roughs	Wilbarger Creek	Big Sandy Creek	Piney Creek
PFOA	7.9	4.7	2	1.1	1.8	2.1	0
PFOS	53.4	2.2	1.9	0	0	0	0

REV 0, 5/5/23



	ES-#	ES-10	ES-#	ES-#	ES-#	ES-#	ES-#
PFOA		3					
PFOS		13					
Total PFAS		30.8					

Environmental Stewardship, TX: PFAS Test Results — Onion - Webberville

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WATERKEEPER® ALLIANCE AFFILIATE

Detects in Yellow

Format part per trillion (ng/L)

Exceeding Proposed Limit

Of Concern

Name				Onion Creek		Gilliland Creek		Decker Creek		Colorado River at Webberville	
Location				Austin, TX 78617 ES-1 ; ONC		Manor, TX 78653 ES-2 ; GILC		Austin, TX 78725 ES-3 ; DEC		Colorado River, Boat Ramp @ Webberville, TX	
Comments/ ES Sample #	EPA Proposed Drinking Water Limits (ng/L)			ES-1	Level Exceeding (#/limit)	ES-2	Level Exceeding (#/limit)	ES-3	Level Exceeding (#/limit)	ES- Upstream	Level Exceeding (#/limit)
Filtration				unfiltered		unfiltered		unfiltered		unfiltered	
Sampling Date				12/16/22		12/16/22		12/16/22		9/16/22	
Barcode										WKA_2022_0242	
Order Number				P-140680472		P-140680472		P-140680472		wtk-22-00126	
PFBA				4.8		2.4		3		2.3	
PFPeA				12.4		10.3		3		3.9	
PFHxA				13.9		6		2.1		3.8	
PFHpA				8		1.7		1.2		1.9	
PFOA	4.0			7.9	2.0	4.7	1.2	2	0.5	2.7	0.7
PFNA	Group			1.1		1.2		< 1 ng/L			
PFDA				< 1 ng/L		< 1 ng/L		< 1 ng/L			
GenX	Group			< 2 ng/L		< 2 ng/L		< 2 ng/L			
PFBS	Group			7.1		6.7		1.9		1.9	
PFHxS	Group			37.5		2.1		1.4		5.1	
PFOS	4.0			53.4	13.4	2.2	0.6	1.9	0.5	4.2	1.1
Group Hazard Index	1.0	0.0	-1.0	4.3	3.3	0.4	-0.6	0.2	-0.8	0.6	-0.4
Total PFAS (11 Compounds)		**0**		**146.1**		**37.3**		**16.5**		**25.8**	
Additional PFAS											
6:2 FTS				1.8							
FBSA				1.4							
PFHpS				1.3							
PFPeS				3.2							
Total PFAS (All Detected)		**0**		**153.8**		**37.3**		**16.5**		**25.8**	

Analysis by:

cyclopure

PFAS compounds collected in the DEXSORB extractiondisc are eluted for anlysis on a HPLC-MS/MS.

Isotope dilution methods are applied to measure a total of 55 PFAS, including all PFASlisted under EPA PFAS test methods.

Cyclopure Inc

EPA PFAS Regulations

EPA has proposed drinking water limits of for (i) PFOA (4.0 ppt) and PFOS (4.0 ppt) and (ii) the group of GenX, PFBS, PFNA, and PFHxS using a Hazard Index calculated from the individual PFAS measurement and an assigned health risk value. See link to Hazard Index calculation.

Texas PFAS Regulations.

Texas Commission on Environmental Quality has not established PFAS drinking limits at this time.

GenX, PFBS, PFNA and PFHxS Hazard Group

What is a Hazard Index?

The Hazard Index is a long-established tool that EPA regularly uses, for example in the Superfund program, to understand health risk from chemical mixtures. EPA is proposing a Hazard Index MCL to limit any mixture containing one or more of PFNA, PFHxS, PFBS, and/or GenX Chemicals. The Hazard Index considers the different toxicities of PFNA, GenX Chemicals, PFHxS, and PFBS. For these PFAS, water systems would use a hazard index calculation to determine if the combined levels of these PFAS in the drinking water at that system pose a potential risk and require action.

Equation

Hazard Index (HI) = ([GenXwater][10 ppt]) + ([PFBSwater][2000 ppt]) + ([PFNAwater][10 ppt])+ ([PFHxSwater][9.0 ppt])

If the running annual average Hazard Indexos greater than 1.0,it is a violation of the proposed HI MCL

See EPA Hazard Index Fact Sheet

ES Rev 0, 4/29/23

Environmental Stewardship, TX: PFAS Test Results

Wilbarger Bend

Environmental Stewardship — A Sustainable Ecosphere

WATERKEEPER® ALLIANCE AFFILIATE

Detects in Yellow

Format part per trillion (ng/L)

Exceeding Proposed Limit

Of Concern

Name		Colorado River, Upper Wilbarger Bend		Colorado Alluvial Aquifer		Tributary at McKinney Roughs		Colorado River at McKinney Roughs		Colorado River at Utley Bridge	
Location		Colorado River, Upper Wilbarger Bend		Colorado Alluvial Aquifer		Tributary at McKinney Roughs		Colorado River at McKinney Roughs		Colorado River @ Utley Bridge	
Comments/ ES Sample #	EPA Proposed Drinking Water Limits (ng/L)	ES-11	Level Exceeding (#/limit)	ES-10	Level Exceeding (#/limit)	ES-13	Level Exceeding (#/limit)	ES-14	Level Exceeding (#/limit)	ES-12	Level Exceeding (#/limit)
Filtration		unfiltered		unfiltered		unfiltered		unfiltered		unfiltered	
Sampling Date		3/17/23		3/17/23				3/29/23		3/17/23	
Barcode								WTK_PFAS_2652		WTK_PFAS_2680	
Order Number		7058		P-140680472				7058		7058	
PFBA		5.8		3.3		5.8		4.6		4.4	
PFPeA		7.5		< 1 ng/L		200.4		8.4		6.4	
PFHxA		9.4		< 1 ng/L		79.2		9.4		9.3	
PFHpA		3.8		< 1 ng/L		2		4.2		4	
PFOA	4.0	5.5	1.4	3	0.8	1.1	0.3	6	1.5	5.2	1.3
PFNA	Group	1.7		1.2		< 1 ng/L		1.8		1.5	
PFDA		1		< 1 ng/L		< 1 ng/L		1.1		1	
GenX	Group	< 2 ng/L		< 2 ng/L		< 2 ng/L		< 2 ng/L		< 2 ng/L	
PFBS	Group	5.5		4		1.5		5.8		5.1	
PFHxS	Group	6.9		6.3		< 1 ng/L		9.6		7.3	
PFOS	4.0	10.3	2.6	13	3.3	< 1 ng/L	0.0	10.9	2.7	9.4	2.4
Group Hazard Index	1.0	0.9	-0.1	0.8	-0.2	0.0	-1.0	0.0	-1.0	0.0	-1.0
Total PFAS (11 Compounds)		**57.4**		**30.8**		**290**		**61.8**		**53.6**	
Additional PFAS											
6:2 FTS											
FBSA								1.1			
PFHpS											
PFPeS								1.0			
Total PFAS (All Detected)		**57.4**		**30.8**		**290**		**63.9**		**53.6**	

Analysis by:

cyclopure

PFAS compounds collected in the DEXSORB extractiondisc are eluted for anlysis on a HPLC-MS/MS.

Isotope dilution methods are applied to measure a total of 55 PFAS, including all PFASlisted under EPA PFAS test methods.

Cyclopure Inc

EPA PFAS Regulations

EPA has proposed drinking water limits of for (i) PFOA (4.0 ppt) and PFOS (4.0 ppt) and (ii) the group of GenX, PFBS, PFNA, and PFHxS using a Hazard Index calculated from the individual PFAS measurement and an assigned health risk value. See link to Hazard Index calculation.

Texas PFAS Regulations.

Texas Commission on Environmental Quality has not established PFAS drinking limits at this time.

GenX, PFBS, PFNA and PFHxS Hazard Group

What is a Hazard Index?

The Hazard Index is a long-established tool that EPA regularly uses, for example in the Superfund program, to understand health risk from chemical mixtures. EPA is proposing a Hazard Index MCL to limit any mixture containing one or more of PFNA, PFHxS, PFBS, and/or GenX Chemicals. The Hazard Index considers the different toxicities of PFNA, GenX Chemicals, PFHxS, and PFBS. For these PFAS, water systems would use a hazard index calculation to determine if the combined levels of these PFAS in the drinking water at that system pose a potential risk and require action.

Equation

Hazard Index (HI) = ([GenXwater][10 ppt]) + ([PFBSwater][2000 ppt]) + ([PFNAwater][10 ppt])+ ([PFHxSwater][9.0 ppt])

If the running annual average Hazard Indexos greater than 1.0,it is a violation of the proposed HI MCL

See EPA Hazard Index Fact Sheet

ES Rev 0, 4/29/23

Environmental Stewardship, TX: PFAS Test Results — Wilbarger to Piney

Environmental Stewardship — A Sustainable Ecosphere
WATERKEEPER® ALLIANCE AFFILIATE

Detects in Yellow — Exceeding Proposed Limit

Format part per trillion (ng/L)

Name		Colorado River at McKinney Roughs		Colorado River at Utley Bridge		Wilbarger Creek		Big Sandy Creek		Piney Creek	
Location		Colorado River at McKinney Roughs		Colorado River @ Utley Bridge		Elgin, TX 78621 ES-8 ; WILC		Bastrop, TX 78602 ES-9 ; BSC		Bastrop, TX 78602 ES-7 ; PINC	
Comments/ ES Sample #	EPA Proposed Drinking Water Limits (ng/L)	ES-14	Level Exceeding (#/limit)	ES-12	Level Exceeding (#/limit)	ES-8	Level Exceeding (#/limit)	ES-9	Level Exceeding (#/limit)	ES-7	Level Exceeding (#/limit)
Filtration		unfiltered		unfiltered		unfiltered		unfiltered		unfiltered	
Sampling Date		3/29/23		3/17/23		12/17/22		12/17/22		12/17/22	
Barcode		WTK_PFAS_2652		WTK_PFAS_2680							
Order Number		7058		7058		P-140680472		P-140680472		P-140680472	
PFBA		4.6		4.4		2.2		1.6		1.6	
PFPeA		8.4		6.4		8.4		4.4		< 1 ng/L	
PFHxA		9.4		9.3		2.8		2.9		< 1 ng/L	
PFHpA		4.2		4		< 1 ng/L		< 1 ng/L		< 1 ng/L	
PFOA	4.0	6	1.5	5.2	1.3	1.8	0.5	2.1	0.5	< 1 ng/L	0.0
PFNA	Group	1.8		1.5		< 1 ng/L		< 1 ng/L		< 1 ng/L	
PFDA		1.1		1		< 1 ng/L		< 1 ng/L		< 1 ng/L	
GenX	Group	< 2 ng/L		< 2 ng/L		< 2 ng/L		< 2 ng/L		< 2 ng/L	
PFBS	Group	5.8		5.1		3.4		1.1		1.2	
PFHxS	Group	9.6		7.3		< 1 ng/L		< 1 ng/L		1.8	
PFOS	4.0	10.9	2.7	9.4	2.4	< 1 ng/L	0.0	< 1 ng/L	0.0	< 1 ng/L	0.0
Group Hazard Index	1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.2	-0.8
Total PFAS (11 Compounds)		**61.8**		**53.6**		**18.6**		**12.1**		**4.6**	
Additional PFAS											
6:2 FTS											
FBSA		1.1									
PFHpS											
PFPeS		1.0									
Total PFAS (All Detected)		**63.9**		**53.6**		**18.6**		**12.1**		**4.6**	

Analysis by:

cyclopure

PFAS compounds collected in the DEXSORB extractiondisc are eluted for anlysis on a HPLC-MS/MS.

Isotope dilution methods are applied to measure a total of 55 PFAS, including all PFASlisted under EPA PFAS test methods.

Cyclopure Inc

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EPA has proposed drinking water limits of for (i) PFOA (4.0 ppt) and PFOS (4.0 ppt) and (ii) the group of GenX, PFBS, PFNA, and PFHxS using a Hazard Index calculated from the individual PFAS measurement and an assigned health risk value. See link to Hazard Index calculation.

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GenX, PFBS, PFNA and PFHxS Hazard Group

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The Hazard Index is a long-established tool that EPA regularly uses, for example in the Superfund program, to understand health risk from chemical mixtures. EPA is proposing a Hazard Index MCL to limit any mixture containing one or more of PFNA, PFHxS, PFBS, and/or GenX Chemicals. The Hazard Index considers the different toxicities of PFNA, GenX Chemicals, PFHxS, and PFBS. For these PFAS, water systems would use a hazard index calculation to determine if the combined levels of these PFAS in the drinking water at that system pose a potential risk and require action.

Equation

Hazard Index (HI) = ([GenXwater][10 ppt]) + ([PFBSwater][2000 ppt]) + ([PFNAwater][10 ppt])+ ([PFHxSwater][9.0 ppt])

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ES Rev 0, 4/29/23

Environmental Stewardship, TX: PFAS Test Results — Bastrop - Smithville

Environmental Stewardship — A Sustainable Ecosphere ™

WATERKEEPER® ALLIANCE AFFILIATE

Detects in Yellow — Exceeding Proposed Limit

Format part per trillion (ng/L)

Name		Colorado River at Bastrop				Cedar Creek		Alum Creek		Colorado River at Smithville	
Location		Colorado River downstream of HWY 71 Bridge, Bastrop, TX				Bastrop, TX 78602 ES-6 ; CEDC		Smithville, TX 78957 ES-5 ; ALC		Smithville, TX 78957 ES-54 ; CRS	
Comments/ ES Sample #	EPA Proposed Drinking Water Limits (ng/L)	ES- Downstream	Level Exceeding (#/limit)			ES-6	Level Exceeding (#/limit)	ES-5	Level Exceeding (#/limit)	ES-4 (54)	Level Exceeding (#/limit)
Filtration		unfiltered				unfiltered		unfiltered		unfiltered	
Sampling Date		9/16/22				12/17/22		12/17/22		12/17/22	
Barcode											
Order Number		wtk-22-00126				P-140680472		P-140680472		P-140680472	
PFBA		1.9				1.9		2.1		7.8	
PFPeA		2.8				< 1 ng/L		2.6		12	
PFHxA		3.1				< 1 ng/L		3.5		12.7	
PFHpA		1.5				< 1 ng/L		1.1		5.1	
PFOA	4.0	1.7	0.4			< 1 ng/L	0.0	1.4	0.4	6.7	1.7
PFNA	Group					< 1 ng/L		< 1 ng/L		1.6	
PFDA						< 1 ng/L		< 1 ng/L		< 1 ng/L	
GenX	Group					< 2 ng/L		< 2 ng/L		< 2 ng/L	
PFBS	Group	1.3				< 1 ng/L		4.3		7.4	
PFHxS	Group	2.1				< 1 ng/L		< 1 ng/L		16.2	
PFOS	4.0	3	0.8			< 1 ng/L	0.0	< 1 ng/L	0.0	12.2	3.1
Group Hazard Index	1.0	0.2	-0.8	0.0	-1.0	0.0	-1.0	0.0	-1.0	1.8	0.8
Total PFAS (11 Compounds)		**17.4**		**0.0**		**1.9**		**15.0**		**81.7**	
Additional PFAS											
6:2 FTS										2.5	
FBSA										1.2	
PFHpS										< 1 ng/L	
PFPeS										1.5	
Total PFAS (All Detected)		**17.4**		**0.0**		**1.9**		**15.0**		**86.9**	

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cyclopure

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ES Rev 0, 4/29/23

Appendix.

PFAS detected by Cyclopure analytical methods.

Compound	Abbreviation	CAS#	EPA 1633
Perfluorobutanoic Acid	PFBA	375-22-4	Y
Perfluoropentanoic Acid	PFPeA	2706-90-3	Y
Perfluorohexanoic Acid	PFHxA	307-24-4	Y
Perfluoroheptanoic Acid	PFHpA	375-85-9	Y
Perfluorooctanoic Acid	PFOA	335-67-1	Y
Perfluorononanoic Acid	PFNA	375-95-1	Y
Perfluorodecanoic Acid	PFDA	335-76-2	Y
Perfluoroundecanoic Acid	PFUnA	2058-94-8	Y
Perfluorododecanoic Acid	PFDoA	307-55-1	Y
Perfluorotridecanoic Acid	PFTrDA	72629-94-8	Y
Perfluorotetradecanoic Acid	PFTeA	376-06-7	Y
Perfluoropropane Sulfonic Acid	PFPrS	423-41-6	
Perfluorobutane Sulfonic Acid	PFBS	375-73-5	Y
Perfluoropentane Sulfonic Acid	PFPeS	2706-91-4	Y
Perfluorohexane Sulfonic Acid	PFHxS	355-46-4	Y
Perfluoroheptane Sulfonic Acid	PFHpS	375-92-8	Y
Perfluorooctane Sulfonic Acid	PFOS	1763-23-1	Y
Perfluorononane Sulfonic Acid	PFNS	474511-07-4	Y
Perfluorodecane Sulfonic Acid	PFDS	335-77-3	Y
Perfluorododecane Sulfonic Acid	PFDoS	79780-39-5	Y
4:2 Fluorotelomer Sulfonate	4:2 FTS	414911-30-1	Y
6:2 Fluorotelomer Sulfonate	6:2 FTS	425670-75-3	Y
8:2 Fluorotelomer Sulfonate	8:2 FTS	481071-78-7	Y
10:2 Fluorotelomer Sulfonate	10:2 FTS	120226-60-0	
Perfluorobutane Sulfonamide	FBSA	30334-69-1	
N-Methylperfluorobutanesulfonamide	MeFBSA	68298-12-4	
Perfluorohexane Sulfonamide	FHxSA	41997-13-1	
Perfluorooctane Sulfonamide	PFOSA	754-91-6	Y
Perfluorodecane Sulfonamide	FDSA	N/A	
N-Ethylperfluorooctane-1-Sulfonamide	NEtFOSA	4151-50-2	Y
N-Methylperfluorooctane-1-Sulfonamide	NMeFOSA	31506-32-8	Y
Perfluorooctane Sulfonamido Acetic Acid	FOSAA	2806-24-8	
N-Ethyl Perfluorooctane Sulfonamido Acetic Acid	NEtFOSAA	2991-50-6	Y
N-Methyl Perfluorooctane Sulfonamido Acetic Acid	NMeFOSAA	2355-31-9	Y
N-methyl perfluorooctanesulfonamidoethanol	NMeFOSE	24448-09-7	Y
N-ethyl perfluorooctanesulfonamidoethanol	NEtFOSE	1691-99-2	Y
Hexafluoropropylene Oxide Dimer Acid	HFPO-DA	13252-13-6	Y
4,8-Dioxa-3H-Perfluorononanoate	ADONA	919005-14-4	Y
Perfluoro-3-Methoxypropanoic Acid	PFMPA	377-73-1	Y
Perfluoro-4-Methoxybutanoic Acid	PFMBA	863090-89-5	Y
Perfluoro-3,6-Dioxaheptanoic Acid	NFDHA	151772-58-6	Y
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid	9Cl-PF3ONS	756426-58-1	Y
11-Chloroeicosafluoro-3-Oxanonane-1-Sulfonic Acid	11CL-PF3OUdS	763051-92-9	Y
Perfluoro(2-ethoxyethane) Sulfonic acid	PFEESA	113507-82-7	Y
Perfluoro-4-ethylcyclohexane Sulfonic Acid	PFECHS	646-83-3	
8-Chloroperfluoro-1-Octanesulfonic Acid	8Cl-PFOS	777011-38-8	
3-Perfluoropropyl Propanoic Acid	3:3FTCA	356-02-5	Y
2h,2h,3h,3h-Perfluorooctanoic Acid	5:3FTCA	914637-49-3	Y
3-Perfluoroheptyl propanoic acid	7:3FTCA	812-70-4	Y
2H-Perfluoro-2-dodecenoic acid	FDUEA	70887-94-4	
2H-perfluoro-2-decenoic acid	FOUEA	70887-84-2	
Bis(perfluorohexyl)phosphinic acid	6:6PFPi	40143-77-9	
(Heptadecafluorooctyl)(tridecafluorohexyl) Phosphinic Acid	6:8PFPi	610800-34-5	
Bis(perfluorooctyl)phosphinic acid	8:8PFPi	40143-79-1	
N-(3-dimethylaminopropan-1-yl) perfluoro-1-hexanesulfonamide	N-AP-FHxSA	50598-28-2	