

Thurston Water Testing for PFAS

April 19, 2023



SIERRA CLUB
ATLANTIC CHAPTER

Sources / Disclaimer

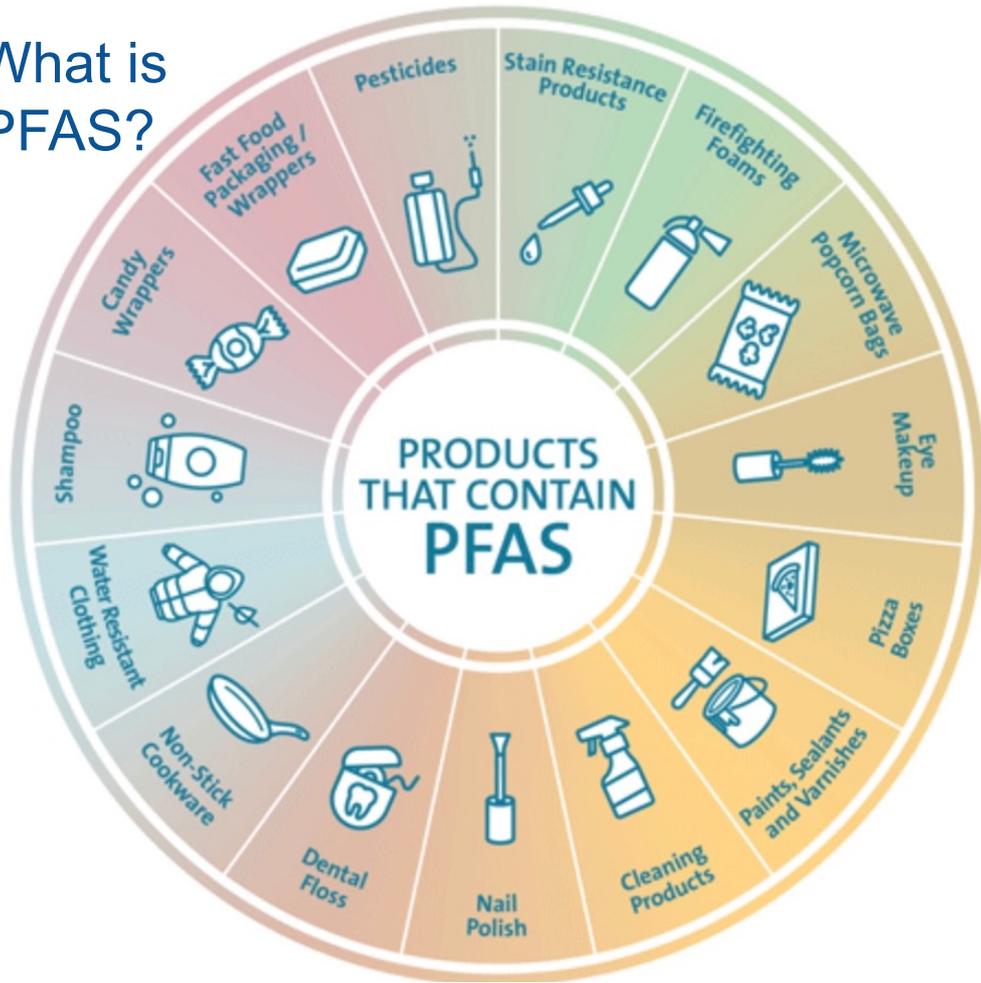
1. Analysis is for discussion purposes only
 - a. All water samples were tested by Cyclopure Labs (Illinois). Results shown here are from the Cyclopure lab reports.
 - b. These are not certified tests.
 - c. Well depths and land spreading timeline were collected at on-site interviews in March 2023.
 - d. All other data shared in this presentation is publicly available, and sourced in this deck.

2. Results are preliminary, subject to change with additional testing

Overview

1. What is PFAS
2. Health Effects of PFAS Exposure
3. Why It Matters in Thurston
4. Purpose and Scope
5. Methodology
6. Current NYS DEC and EPA Guidelines
7. Defined Sample Zones
8. Results By
 - a. Overall PFAS levels vs. DEC / EPA Guidelines
 - b. Less Than 1 PPT
 - c. Greater Than 1 PPT, by total PFAS, Compound, and Zone

What is PFAS?



PFAS: Per- and Polyfluoroalkyl Substances

- Known as “forever chemicals”
- Thousands of types; typically the focus is on ~50 compounds

Examples of PFAS Compounds Found in Thurston Water:

- PFBA
- PFOS
- PFOA

Health Effects of PFAS Exposure



Increased cholesterol levels



Increased risk of high blood pressure or pre-eclampsia in pregnant women



Decreased vaccine response in children



Small decreases in infant birth weights



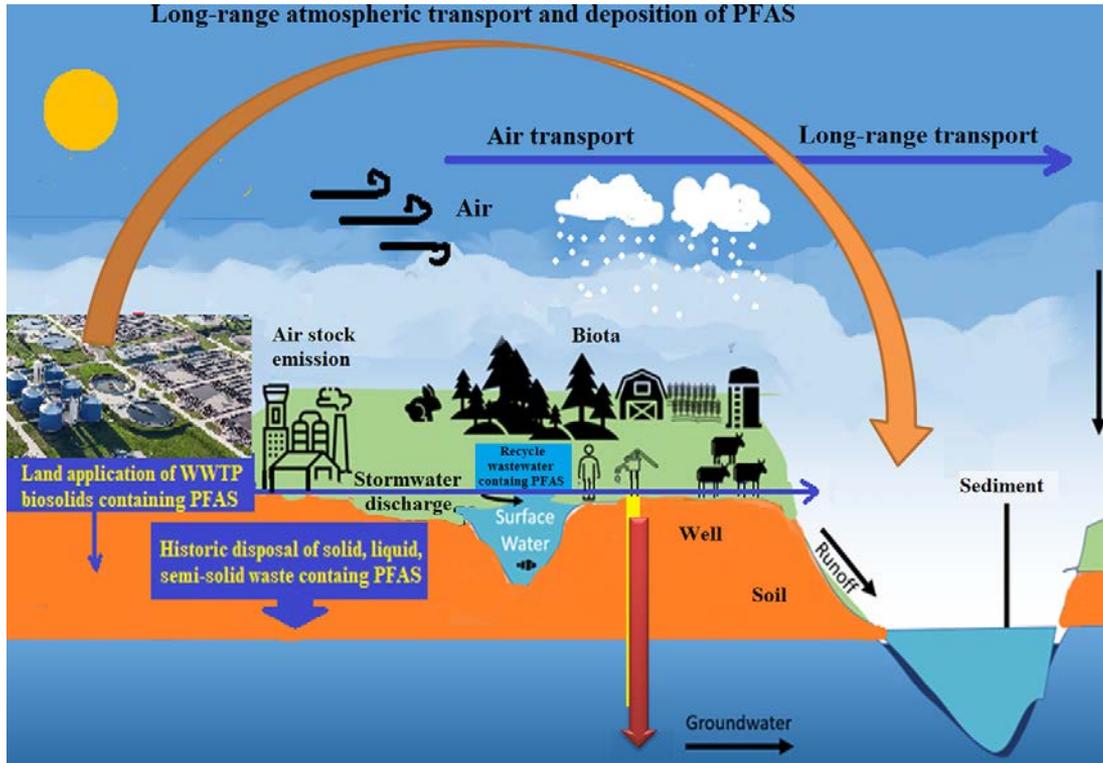
Changes in liver enzymes



Increased risk of kidney or testicular cancer

Why It Matters in Thurston

“Time heals all wounds” may not apply to PFAS contamination.



- Land application of biosolids containing PFAS **collects in the ground and water**
- PFOS and PFOA are both **highly persistent in the environment and highly mobile**. Both chemicals have a tendency to **bioaccumulate in humans, terrestrial organisms, and aquatic organisms**.
- PFOS and PFOA have been **measured in biosolids in multiple published studies**.¹

“WWTP” = Waste Water Treatment Plant

Visual Source: Science Direct, February 2022.

<https://www.sciencedirect.com/science/article/pii/S0048969721060812>

Source: 1EPA Biosolids Meeting, November 2020 (see appendix for details).

Purpose and Scope

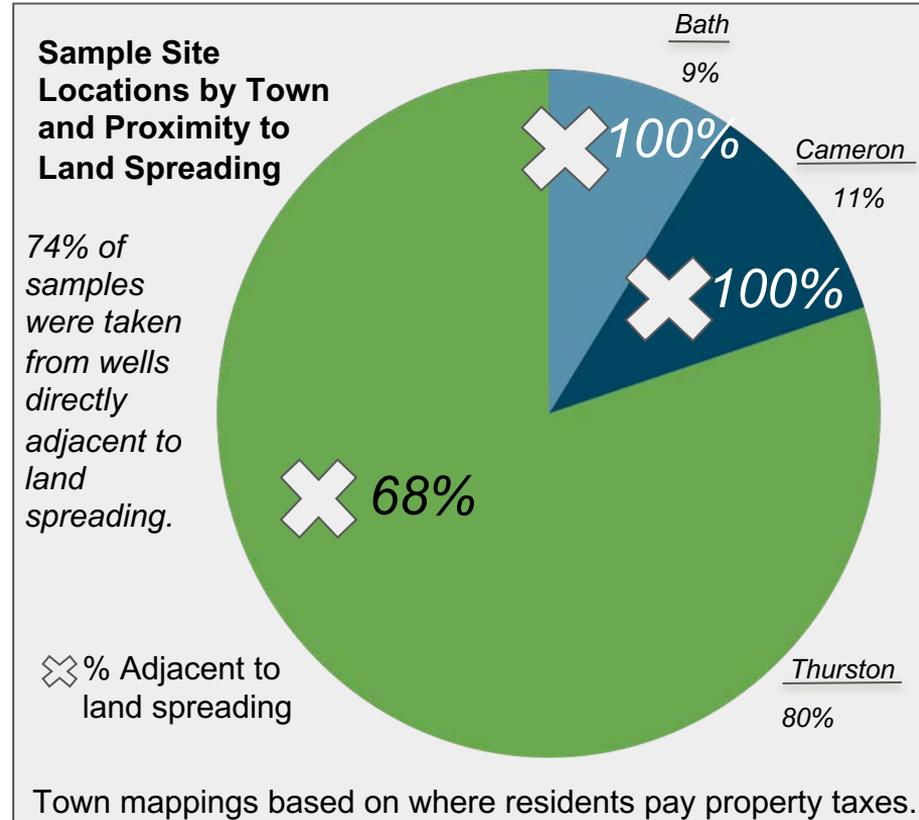
Test results will support property owners, and regional decision-making.

Scope: Thurston residents, or properties adjacent to selected land spreading operations in Thurston.

Water tests were funded by The Sierra Club (86%) and local donations from Thurston (14%).

Why are we doing this?

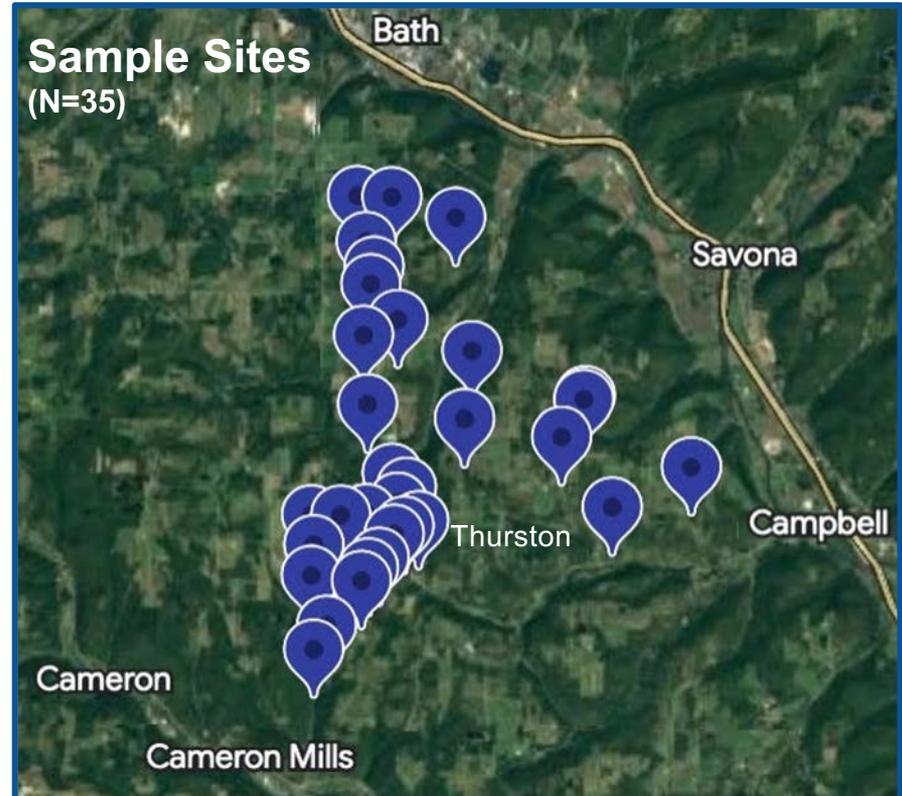
- Awareness of PFAS levels in local drinking water
- Informed local decision-making
- Collect for broader review of PFAS contamination



Methodology

We collected / merged data, and mapped to look for high-level patterns.

- **35** water sources in February - March 2023
 - **91% Private**
 - **9% Public / Businesses**
- Cyclopure Lab tested for **55 PFAS compounds**
- Results compared to guidelines from:
 - **EPA**
 - **NYS DEC**
- Compare PFAS results by:
 - **Total** Contamination Level (Parts per Trillion - PPT)
 - **Zones** (defined later)
 - **Compound** (PFAS type)



Source: Google Earth Pro, March 2023.

Current NYS and EPA PFAS Guidelines

Not all compounds have defined Parts per Trillion (PPT) limits.

	EPA		NYS DEC
	Enforceable (Proposed – March 2023)	Advisory (June 2022)	Human Health – Ambient / Raw Water Source
PFOA	4	0.004	6.7
PFOS	4	0.02	2.7
PFBS	-	2,000	-

The DOH public water guideline is 10 PPT. None of the water tested falls under this guideline because our sources were private wells and streams.

These are all examples of PFAS compounds.

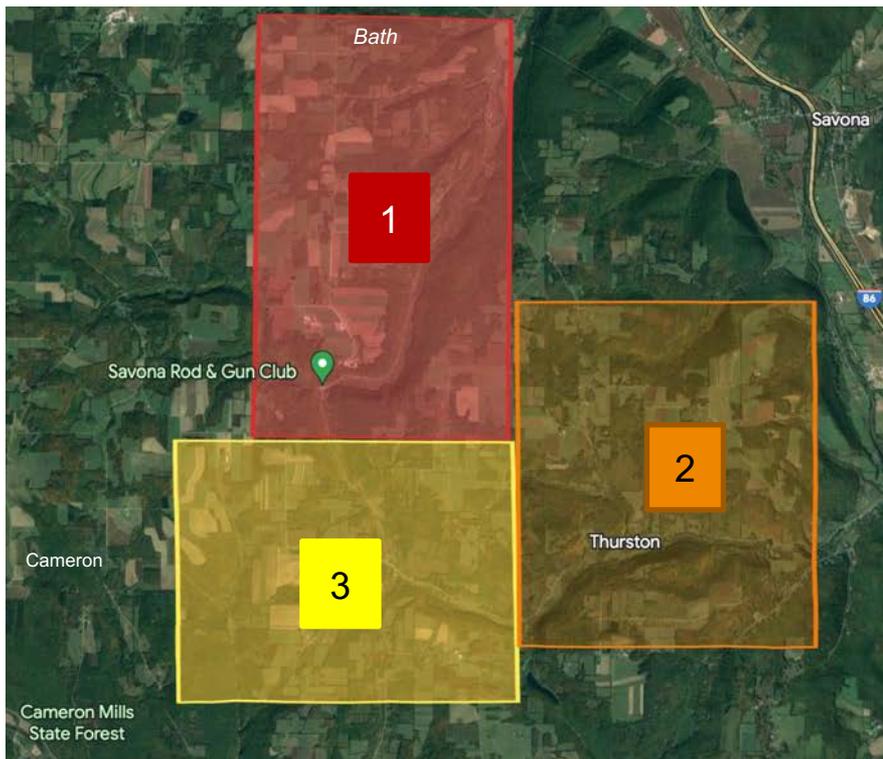
There are many more that do not have a limit defined by oversight agencies.

Measures above are in PPT unless otherwise noted.

Note: EPA: Proposed as of 3/16/23. EPA (2023 Proposed PFAS National Primary Drinking Water Regulation). NYS DEC: Proposed as of 3/15/23. EPA 'Actual' as of June 2022. NYS DEC (DEC Issues Ambient Water Guidance). See appendix for source links.

Defined Sample Zones

We created 3 zones within the sample region to better understand the test results.



Zone	# of Samples	Land Spreading Est. Start ¹
1: Bonny Hill	10	1980s
2: Thurston	8	After 2010
3: Risingville	17	After 2010

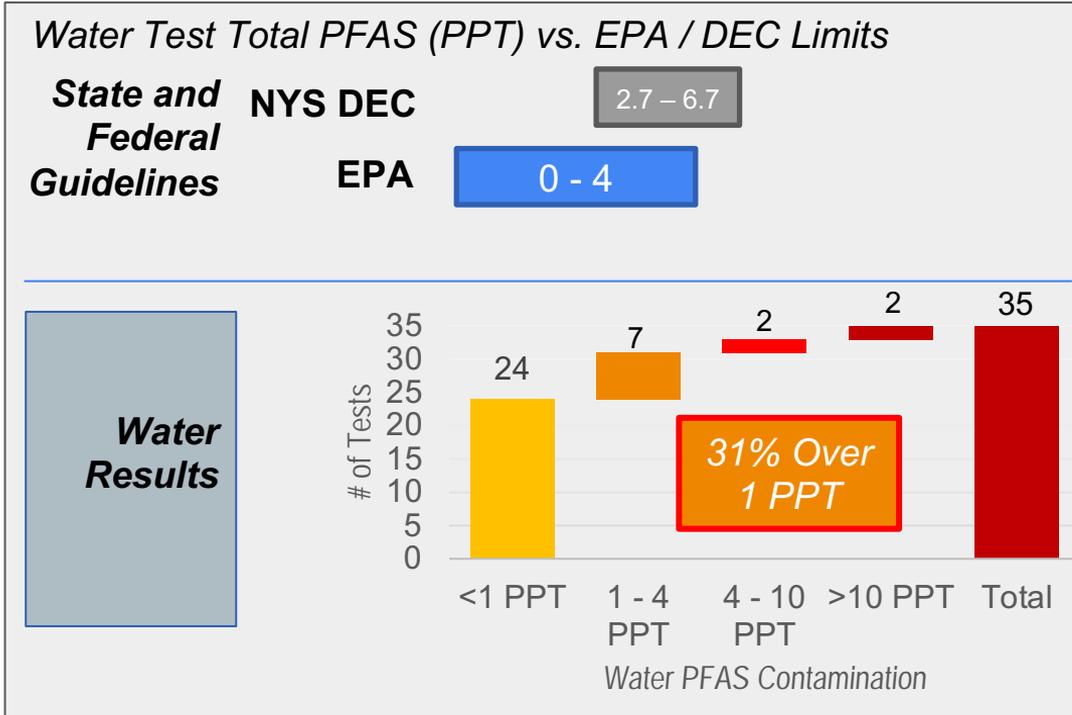
↑ PFAS Contamination ↓

Source: Google Earth Pro, March 2023. Zone overlay manually added for visualization.

¹Source: 15 residents adjacent to spreading operation, as of March 2023.

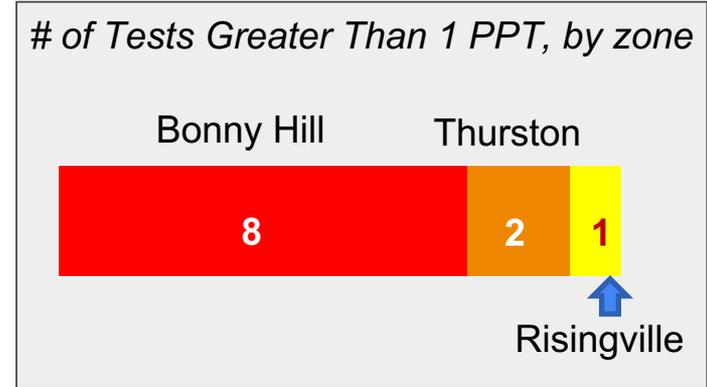
Results – Big Picture

90% of the greater than 1 PPT samples were taken from water directly adjacent to land spreading.



Key Findings:

- All water contained at least **11 PFAS compounds**.
- **31% (11 sites)** samples **greater than 1 PPT**



Note: EPA: Proposed as of 3/16/23. EPA (2023 Proposed PFAS National Primary Drinking Water Regulation). NYS DEC: Proposed as of 3/15/23. NYS DEC (DEC Issues Ambient Water Guidance). See appendix for source links. Measures above are in PPT unless otherwise noted. The Risingville sample greater than 1 PPT was from a stream.

Results – Less Than 1 PPT

Generally, PFAS compounds were found in quantities less than 1 PPT.

It's unclear what % of the results less than 1 PPT exceed the EPA 2022 guidelines.

	PFDA	HFPO-DA (GenX)	PFHxS	PFNA	PFHxA	PFHpA	PFPeA	PFBA	PFOA	PFOS	PFBS	N- MeFOSA A	NMeFOS E	FBSA
# of Compounds Found <1 PPT	35	35	35	35	34	34	34	32	32	30	28	1	1	1
EPA Guideline (PPT - 2022)	-	-	-	-	-	-	-	-	0.004	0.02	-	-	-	-

There were 62 instances of PFOA and/or PFOS in the “less than 1 PPT” results.



Note: EPA ‘Actual’ as of June 2022. See appendix for link. Measures above are in PPT unless otherwise noted.

Results – Greater Than 1 PPT – By Total PFAS

There were 11 samples with total PFAS greater than 1 PPT.

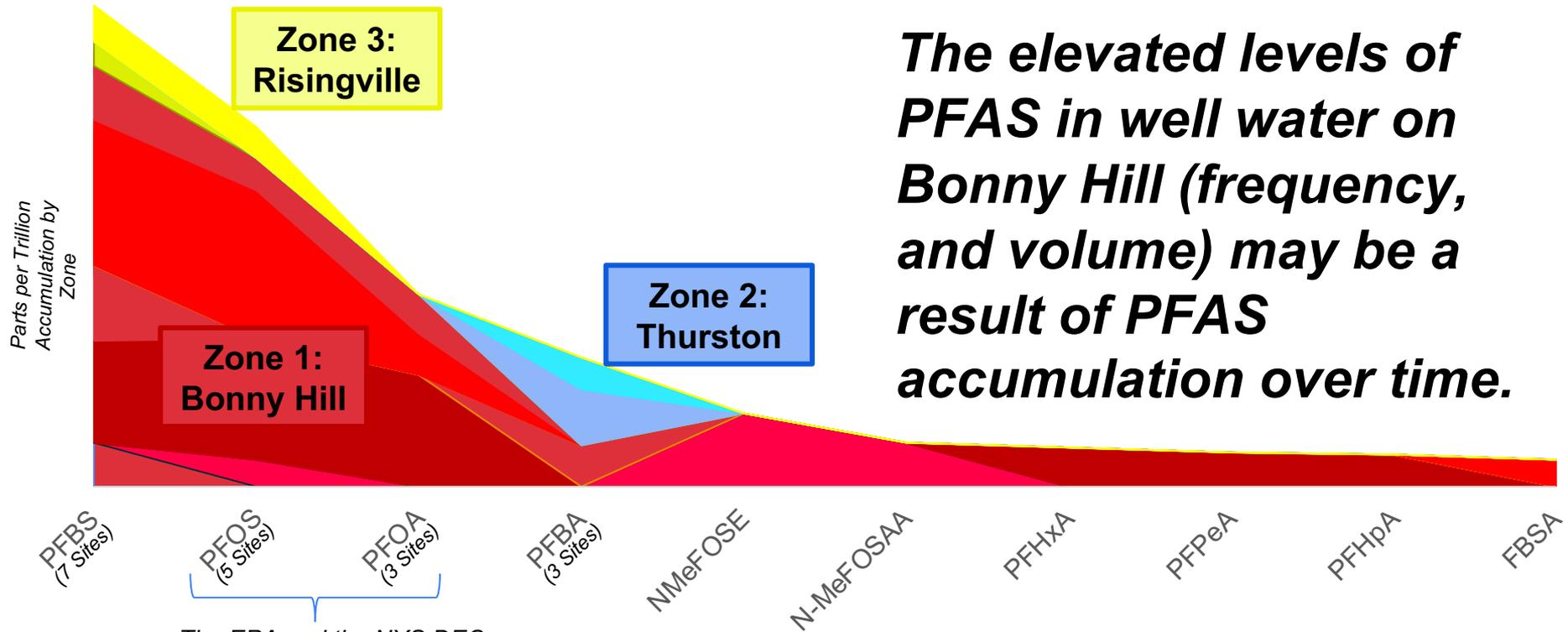
Reference	1	2	3	4	5	6	7	8	9	10	11
Zone	Bonny Hill	Thurston	Thurston	Bonny Hill	Bonny Hill	Risingville	Bonny Hill				
Total PFAS (PPT)	18.1	14.9	5.9	5.1	3.1	2.8	2.3	1.8	1.7	1.3	1.0
Compound with Highest Level Detected	PFOS	PFOS	NMeFOSE	PFBS	PFBS	PFBS	PFBA	PFBS	PFBA	PFBA	PFBS



Note: Cyclopure results, March 2023. Zone mapping done by Thurston Water team.

Results – Greater Than 1 PPT – By PFAS Compound

PFBS was the most common and highest-PPT compound found in the 35 samples.



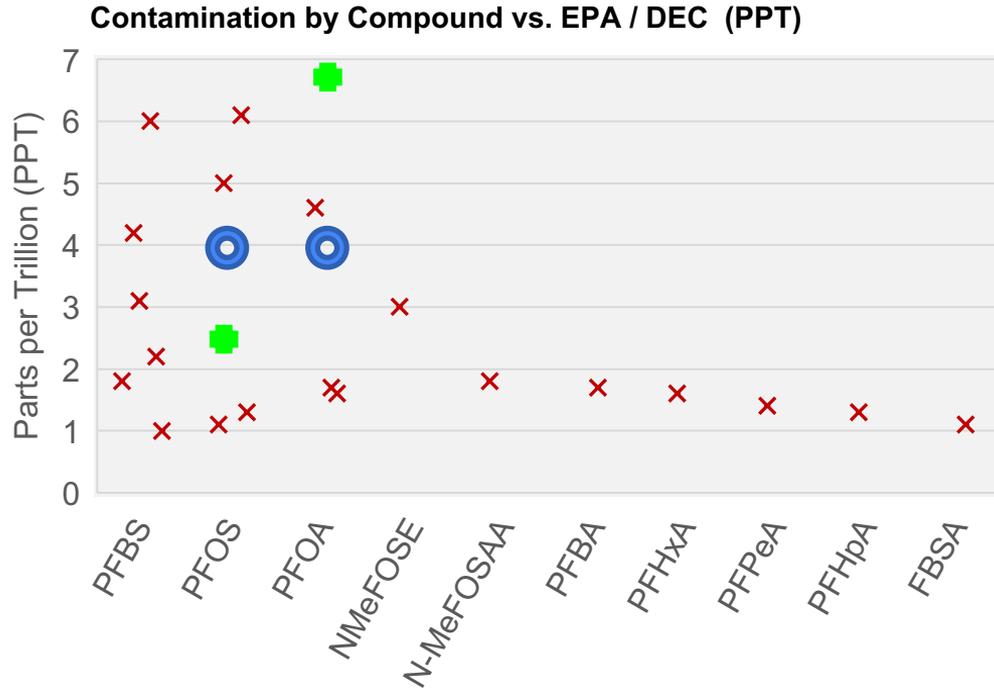
The elevated levels of PFAS in well water on Bonny Hill (frequency, and volume) may be a result of PFAS accumulation over time.

The EPA and the NYS DEC have quantifiable PPT-limits for PFOS and PFOA.

Note: PPT scores are not cumulative. Data from Cyclopure Lab, 2023. See Appendix for EPA / DEC.

Deep Dive: Bonny Hill

Ten compounds were found across 8 sites at greater than 1 PPT.



Exceeds EPA and/or NYS DEC Thresholds:

- PFOS (2 samples)
- PFOA (1 sample)

80% of samples on Bonny Hill indicate PFAS contamination over 1 PPT.

Total Tests: 10

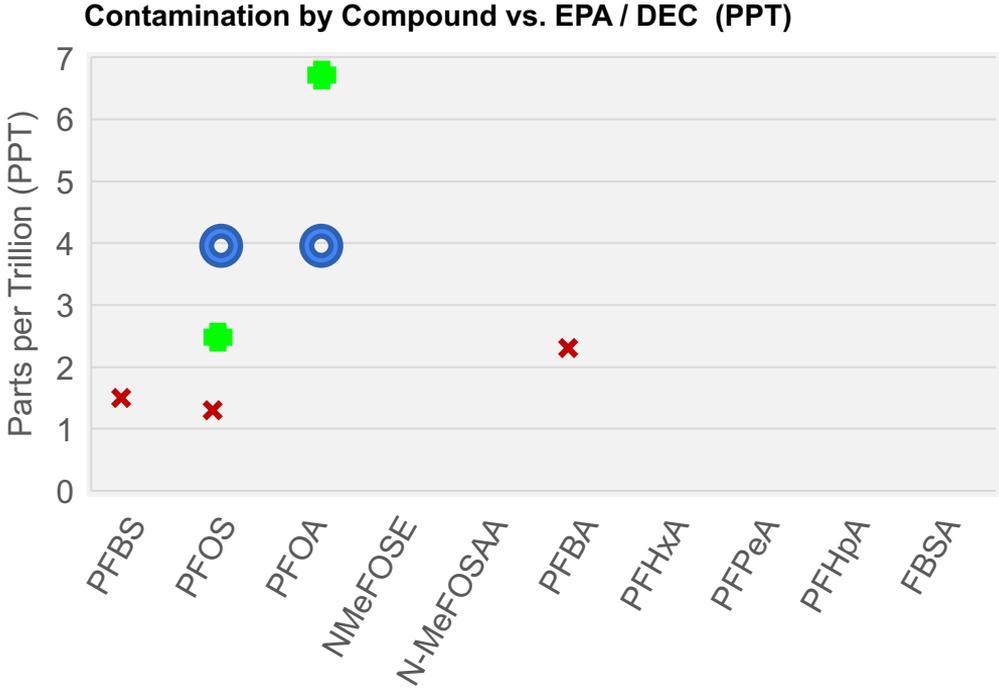
Key

- ✕ Bonny Hill Greater Than 1 PPT
- ⊙ EPA Max
- NYS DEC Max

Note: PFAS PPT data from Cyclopure Lab, March 2023. See Appendix for EPA / NYS references.

Deep Dive: Thurston

Three compounds were found across 2 sites at greater than 1 PPT.



25% of samples from Thurston indicate PFAS contamination over 1 PPT.

Total Tests: 8

Key

- ✕ Thurston Greater Than 1 PPT
- ⊙ EPA Max
- NYS DEC Max

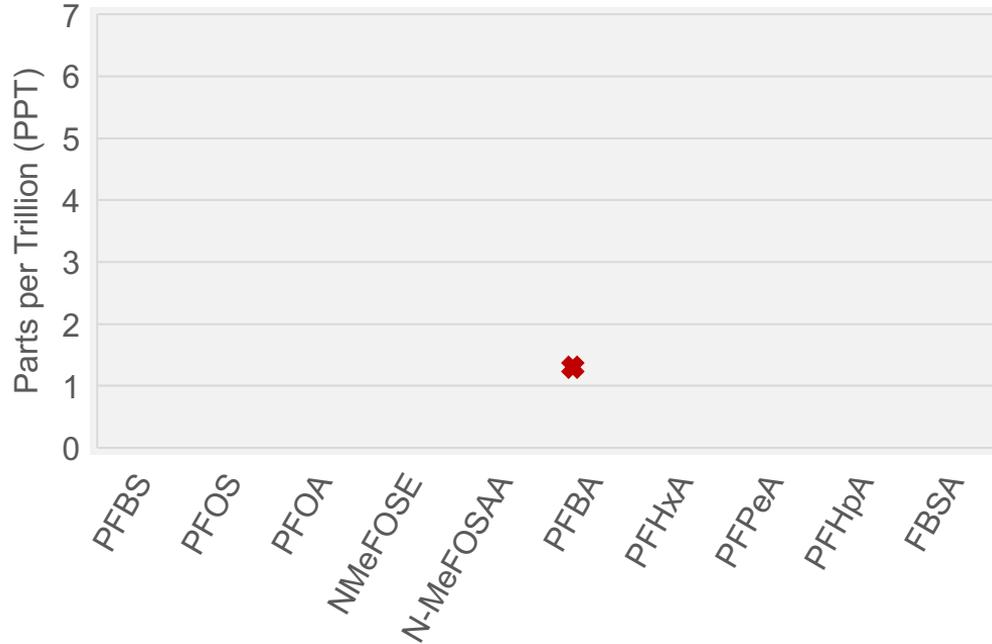
Note: PFAS PPT data from Cyclopure Lab, March 2023. See Appendix for EPA / NYS references.



Deep Dive: Risingville

One compound was found at 1 sites at greater than 1 PPT.

Contamination by Compound vs. EPA / DEC (PPT)



6% of samples from Risingville indicate PFAS contamination over 1 PPT.

Total Tests: 17

Note: the Risingville greater than 1 PPT results was from a stream used for collecting drinking water.

Key

- ✖ Risingville Greater Than 1 PPT
- ⊙ EPA Max
- ⊕ NYS DEC Max

Note: PFAS PPT data from Cyclopure Lab, March 2023. See Appendix for EPA / NYS references.

Contact Information

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(607) 227-4897

Appendix

Reference: Sources

Description	Link
EPA (2023 Proposed PFAS National Primary Drinking Water Regulation)	https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas
EPA (2022 Federal Register)	https://www.govinfo.gov/content/pkg/FR-2022-06-21/pdf/2022-13158.pdf
NYS DEC (2023 DEC Issues Ambient Water Guidance)	https://www.dec.ny.gov/chemical/122803.html https://www.dec.ny.gov/press/127293.html
NYS DEC (2023 NYS Mines and Well Map)	https://gisservices.dec.ny.gov/gis/maw/
Steuben County Parcel Finder (March 2023)	https://scnygis.maps.arcgis.com/apps/webappviewer/index.html?id=52e7258379e24f27a634111d2493d386
EPA Guidance on PFAS Contamination (March 2023)	https://www.epa.gov/pfas/our-current-understanding-human-health-and-environmental-risks-pfas
EPA Biosolids PFOA & PFOS Problem Formulation Meeting Summary (November 2020)	https://www.epa.gov/sites/default/files/2021-02/documents/biosolids-pfoa-pfos-meeting-summary-nov-2020.pdf
Minnesota DOH (April 2023)	https://www.health.state.mn.us/communities/environment/risk/docs/guidance/gw/pfbsinfo.pdf

Formula for Hazard Waste Index (EPA, 2023)

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