



PFAS/PFOS in Cotuit

Town of Barnstable
Town Council PFAS Workshop
April 11, 2024
David Churbuck, Commissioner
Chris Wiseman, Superintendent



Summary – Cotuit PFAS status

There have been no violations of the PFAS6 MCL to date

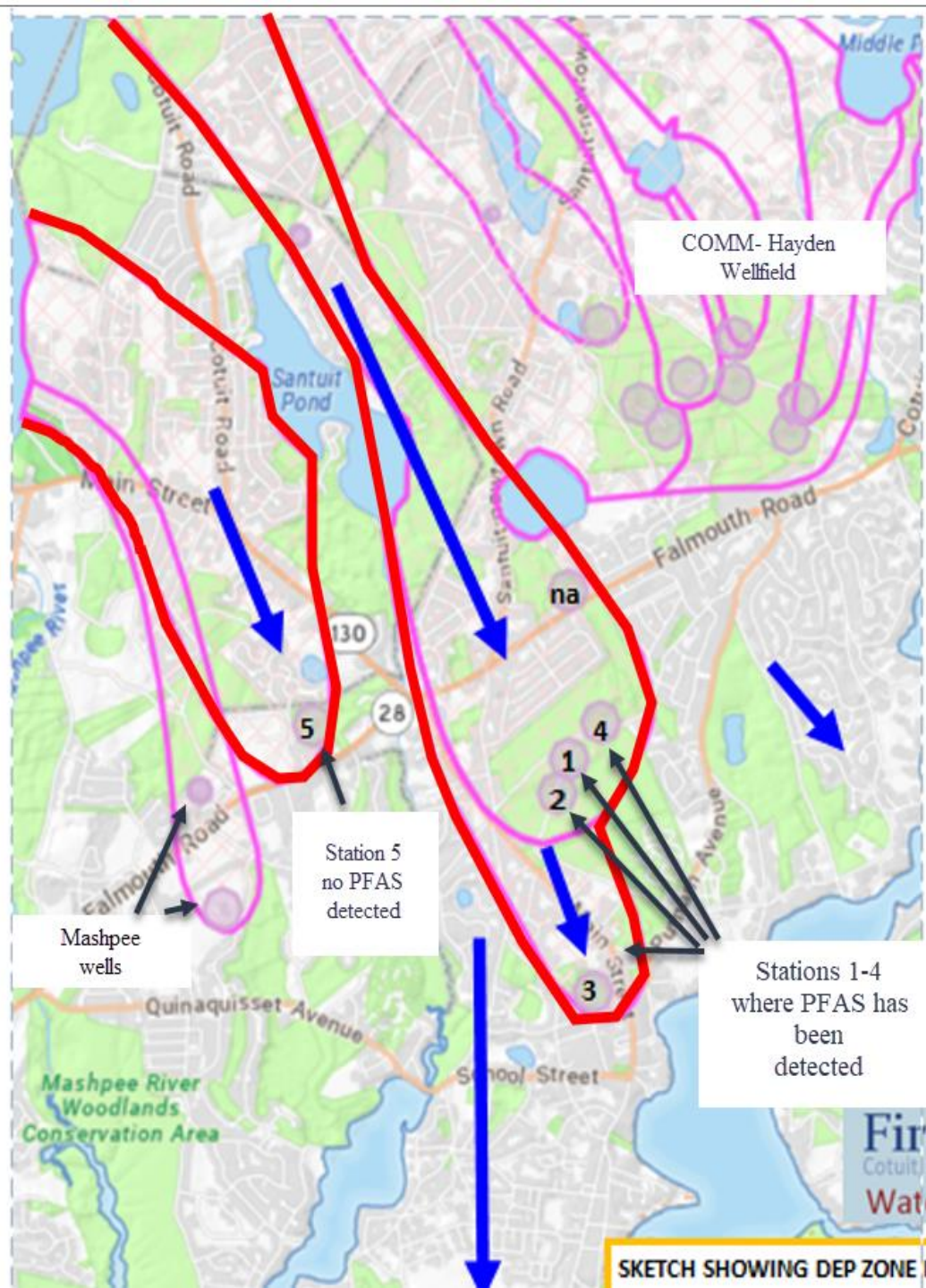
- **Levels:** Low levels of PFAS6 have been detected at four of five stations since testing commenced in September 2020
 - Two adjacent stations: #1 and #4 are the focus of most detections
 - Highest concentration ever detected was at station 1 -- 9.3 ng/l -- on 1/24/22
 - Most recent test of station 1 made in April 2023, showed a significantly lower level of PFAS6 at 2.14 ng/L
 - Station 5, the westernmost station directly abutting Mashpee has never tested positive
 - Station 3, the southernmost station near the Cotuit Elementary School, has only revealed one instance of PFAS6 contamination
 - Station 2, which is adjacent to stations 1 and 4, has only yielded one detection of 5.1 ng.l
- **Sources:**
 - Upgradient sources to the northwest flowing into Cotuit from Mashpee or Sandwich and the Massachusetts Military Reservation.
 - Residential septic systems: in lieu of an obvious source (fire fighting foams, landfills, etc.) , and based on studies
- **Treatment Options:**
 - **Water treatment plant:** CWD planned a water treatment facility because of excessive levels of manganese and iron as well as complaints about dirty water . A consulting engineering study completed in 2018 estimated a \$11 million cost without additional equipment costs for PFAS mitigation. The 5-year capital improvement budget assumes an estimated \$26 million price tag
 - **Source Water Protection:** Barnstable’s CWMP doesn’t expect municipal sewer to reach the village for 20-30 years, the Cotuit Water Commission is developing a source water protection plan to identify and upgrade residential septic systems with high potential impacts on the well field. The fire district’s voters will be asked to approve a warrant article at the annual meeting in May to allow the commission to seek an amendment to the Fire District’s enabling legislation permitting the district to upgrade privately owned title 5 septic systems and reduce the impact of those systems with the highest impact on the well field.
- **Public notification:**
 - The public disclosure of PFAS detection and health warnings have been made to the public in the annual water quality reports sent to all village residents every year since 2020.
 - A PFAS pamphlet has been drafted and will be distributed pending final approval by the BOWC



Cotuit's five public supply wells have recharge areas that stretch northwest into Marstons Mills, Mashpee and even Sandwich

Low levels of PFAS6 have been detected in every station (at least once) except for station 5 which has not shown any contamination to date.

The highest level detected was 9.3 ng/l at station 1 in January 2022



DATE	STA	PFAS6 Ng/l	Unreg. *	DATE	STA	PFAS6 Ng/l	Unreg. *
9/7/20	1	5.9	0	7/26/22	1	6.5	2.5
	2	0	0		2	na	na
	3	0	0		3	na	na
	4	0	0		4	2.1	2
9/21/20	5	0	0		5	na	na
11/2/20	1	6.2	2.1	4/18/23	1	2.14	2.95
	2	0	0		2	na	na
	3	0	0		3	na	na
	4	2.1	0		4	2.1	2.80
	5	0	0		5	na	na
1/24/22	1	9.3	5.7				
	2	5.1	6				
	3	3	2.1				
	4	3	2.8				
	5	0	0				
5/5/22	1	2.6	2.4				
	2	na	na				
	3	na	na				
	4	2.8	2.1				
	5	na	na				

*: "unreg" are tests for the EPA's 5th Unregulated Contaminant Monitoring Rule's list of 29 PFAS variants and lithium issued in 2021



PFAS Timeline

2019:

- 1/20: the threat of PFAS contamination is first discussed by the Board of Water Commissioners (BOWC) and the decision to test ASAP is made
- 6/20: Tata & Howard's Water Quality and Treatment Report recommends the future design and placement of a water treatment facility to address high manganese levels

2020:

- Cotuit Water Department (CWD) given testing prioritization by MassDEP due to elevated levels of PFAS detected in Mashpee
- 1/5/20: BOWC reviews Tata & Howard report that recommends adding a water treatment facility due to high manganese levels
- 9/2/20: First PFAS testing. Low levels detected in Stations 1 and 4 for the first time
- 11/20: Second round of tests. Low levels again detected in Stations 1 and 4
- 12/16/20 *"The detection levels do not require action at this time and the district will be required to do quarterly testing beginning in 2021."*

2021:

- 2020 annual water quality report notifies consumer of initial PFAS test results and "Special Health Information"

2022:

- 1/22 EPA notice of Unregulated Contaminant Monitoring Rule 5 received: 12/21 – 29 pfas and Lithium unregulated contaminants
- 7/22: Third round of tests made in July 2022. Highest levels of PFAS6 detected in Station One at 6.53 ng/L.
- PFAS plan added to the Cotuit Water Department's FAQ
- 11/22/22: CWD selected by the EPA for UCMR5 testing (29 PFOA/PFOS compounds) due to the size of the population served

2023:

- 3/15/23: BOWC informed that the Maximum Contaminant Level (MCL) for PFAS6 could be lowered from 20 ng/l to 4 ng/l
- 3/15 :first tests to include testing for the EPA's UCMR 5
- 4/19/23 BOWC recommends changing 5 yr. capital improvement plan/budget to plan for treatment.
- 4/23: fourth series of tests conducted. Results continue to indicate low levels in Stations 1 and 4 – Station One levels decrease to 2.14 ng/L.
- 9/23: second set of UCMR 5 tests

2024:

- Tests performed in April 2024, results to follow in May



Additional per-fluoro compound tests performed

- In addition to testing for PFAS6, CWD has also tested and reported on:
 - **PFBS** (perflouobutrance sulfonic acid) – 2020 and 2023 highest detection 2.8 ng/L – no violation
 - **PFHxA** (perflourhexanoic acid)) - 2022 and 2023 – highest detection 2.09 – no violation
- UCMR 5 – Unregulated Contaminant Monitoring Rule :
 - EPA published the fifth version of of its UCMR rules in December 2021
 - 29 additional PFAS compounds as well as lithium
 - First UCMR5 tests were performed in Cotuit in March 2023



Public Notification

- In 2020 the CWD published its first advisory about PFBS in the annual Drinking Water Quality Report and has repeated the same warning in all subsequent annual reports.

SPECIAL HEALTH INFORMATION

Based on studies of laboratory animals, people exposed to elevated levels of PFBS for several years could experience effects on the liver, thyroid, blood and kidneys. Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be at particular risk from infections. These people should seek advice from their health care providers. EPA/Centers for Disease Control and Prevention (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.



Public PFAS communication

The first public discussion of PFOA/PFAS risks in Cotuit occurred on January 30, 2019 when Superintendent Wiseman advised the commissioners:

“VOC and MTBE samples will be conducted in February. They also discussed the recent news articles regarding PFOA and PFOS found in many water supplies. We are not currently required to test for this, however MassDEP will be setting new thresholds and we will likely be required to in the future. The commissioners asked the Superintendent to budget for the testing in the next fiscal year to establish a baseline.”

The first public advisory about PFAS concerns was made by the Cotuit Water Department in April 2019 on the Cotuit Fire District website following news coverage in the Cape Cod Times of PFAS threats:

“The Cotuit Water Commission and Water Department has previously discussed the emerging concern about these potential contaminants identified by the MassDEP in the CCTimes article of April 18th. While we do not expect to find any evidence of PFAS or PFOS in the Cotuit water supply, we will be requesting funds for new testing in our FY2020 budget, to be voted at the District Meeting on May 29, 2019. The contamination cited in the news article in Mashpee and Hyannis are separate and distinct parts of the Sagamore Lens of the Cape Cod Aquifer and Cotuit’s drinking water does not contain any underground flow from these areas. We will report our test results next year to the public, upon completion.”

Signed,

Mark Robinson,

Commissioner

April 2022” the water department’s FAQ on the fire district website was revised to include information about PFAS risks:

“Are you on top of PFAS and other emerging contaminants?”

The Water Department began testing for PFAS before it was required by the state of Massachusetts. PFAS is an acronym for a suite of chemicals found in many household products and fire-retardant materials. Cotuit’s water is below the maximum limit for PFAS in drinking water set by the state in 2020. The Water Department will continue to follow guidance from the state on regulating PFAS in public drinking water.”

April 2024: the Cotuit Water Commission will present its Source Water Protection Plan to the Cotuit Santuit Civic Association on April 16 at Freedom Hall



PFAS Pamphlet under development



PFAS (Per- and polyfluoroalkyl substances) and PFOS (Perfluorooctanesulfonic acid) are synthetic chemicals used in a variety of household products for their water and grease-resistant properties. Called PFAS for short, these chemicals have earned the nickname "forever chemicals" because they are long-lasting and take an incredibly long time to break down. In the environment, like in soil or water, PFAS may never fully break down.

Knowledge is Power

When it comes to safeguarding our health, and the environment – specifically our drinking water supply – knowledge is power. This pamphlet aims to provide you with essential information about Perfluoroalkyl Substances (PFAS) and Perfluorooctanesulfonic Acid (PFOS), common contaminants in household products, to help you make informed decisions for your well-being.

Cotuit Water Department
4300 Falmouth Road
Cotuit, MA 02635

Recipient
Street Address
City, ST ZIP Code



(508)-428-2687
www.cotuitfiredistrict.org/water-department



Understanding PFAS/PFOS in Household Products



Where are PFAS and PFOS Found?

Common Household Products such as:

- Non-stick cookware
- Water-resistant clothing
- Carpets and upholstery
- Food packing
- Cleaning products
- Cosmetics and personal care items



How to Identify PFAS/PFOS in Products.

Read Labels & Ask Questions:

- Look for **Fluoro** or Perfluoro in the ingredients list.
- Check for specific chemical names: PFOS, PFOA, PFBS, etc.
- Ask manufacturers about the presence of PFAS/PFOS in their products.

How does PFAS get into the Ground Water?

Industrial Discharge & Household Wastewater

Firefighting Foam

Wastewater Treatment Plants & Household Septic Systems

Outdoor Watering and Lawn Care

Land Applied Bio-Solids (Fertilizer)



Safer Alternatives and Tips:

- Choose stainless steel or cast-iron cookware.
- **Opt** for natural fiber clothing.
- Use glass or stainless **steel** containers for food storage.
- Select cleaning products with eco-friendly labels.
- Support cosmetic brands and personal care products that explicitly state that their products are PFAS-free.
- Research PFAS-free outdoor gear such as tents, backpacks, and rain gear.

Protect Your Drinking Water.

- Install a certified water filter.
- Regularly test your drinking water source.
- Stay informed about your water source.
- Be mindful of potential contamination sources and the products you choose.
- Advocate for water quality and participate in environmental initiatives.
- Support your local water department.

What Steps Are We Taking?

- Performing Water Quality Testing, Monitoring & Regulatory Compliance
- Collaborating with Environmental Agencies
- Advocating for Addition Source Water Protection Initiatives
- Engaging with the Community
- Maintaining our Infrastructure
- Assessing Treatment Options
- Developing an Emergency Response Plan to Address Potential PFAS Incidents



Treatment Options: Water Treatment Plant

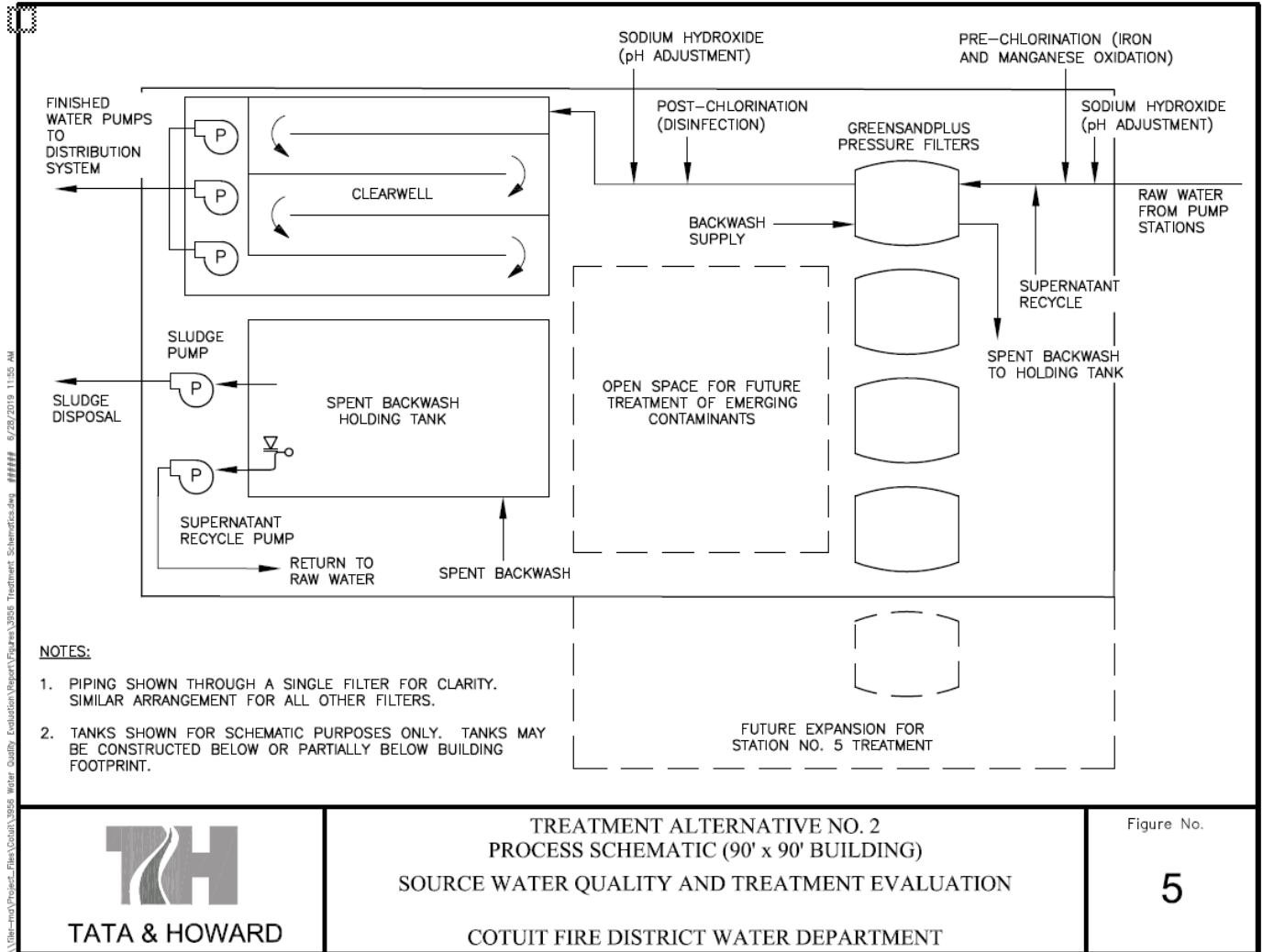
In 2019 the engineering firm Tata & Howard delivered its recommendations for the construction of a water treatment facility in Cotuit. The report did not cover PFAS treatment, but anticipated the need to do so in the future. Of the two options recommended by T&H , the second option included building additional space for the future addition of granular activated carbon (GAC) filter vessels capable of removing PFAS compounds. The cost estimate below does not reflect the additional costs for PFAS mitigation, nor the costs related to routing the raw water from all five stations to a treatment plan to be located conterminously with stations 1,2, and 4. The water department’s long-term capital plan includes a \$25 million cost for a full water treatment plan capable of removing PFAS

Table No. 9
Total Estimated Costs for Alternative No. 2

Description	Estimated Cost
Water Treatment Facility Construction:	\$7,050,000
Contractor Overhead and Profit (15%)	\$1,055,000
General Conditions, Bonds, and Insurance (10%)	\$810,000
Construction Total:	\$8,915,000
Pilot Test, Study, and Report	\$100,000
Engineering (Design, Permitting, Bidding, and Construction Administration) and Contingency (25%)	\$2,230,000
Alternative No. 2 Total:	\$11,245,000



Water treatment plant schematic



The 2019 Tata and Howard report on Source Water Quality and Treatment Evaluation did not estimate the additional costs related to PFAS mitigation, but provided future expansion space to accommodate the treatment of emerging contaminants

The long-term capital budget for the Cotuit Water department assumes a \$1 million expense for additional planning and engineering, and \$25 million for construction and the rerouting of mains to a PFAS capable treatment facility.



TREATMENT ALTERNATIVE NO. 2
 PROCESS SCHEMATIC (90' x 90' BUILDING)
 SOURCE WATER QUALITY AND TREATMENT EVALUATION
 COTUIT FIRE DISTRICT WATER DEPARTMENT

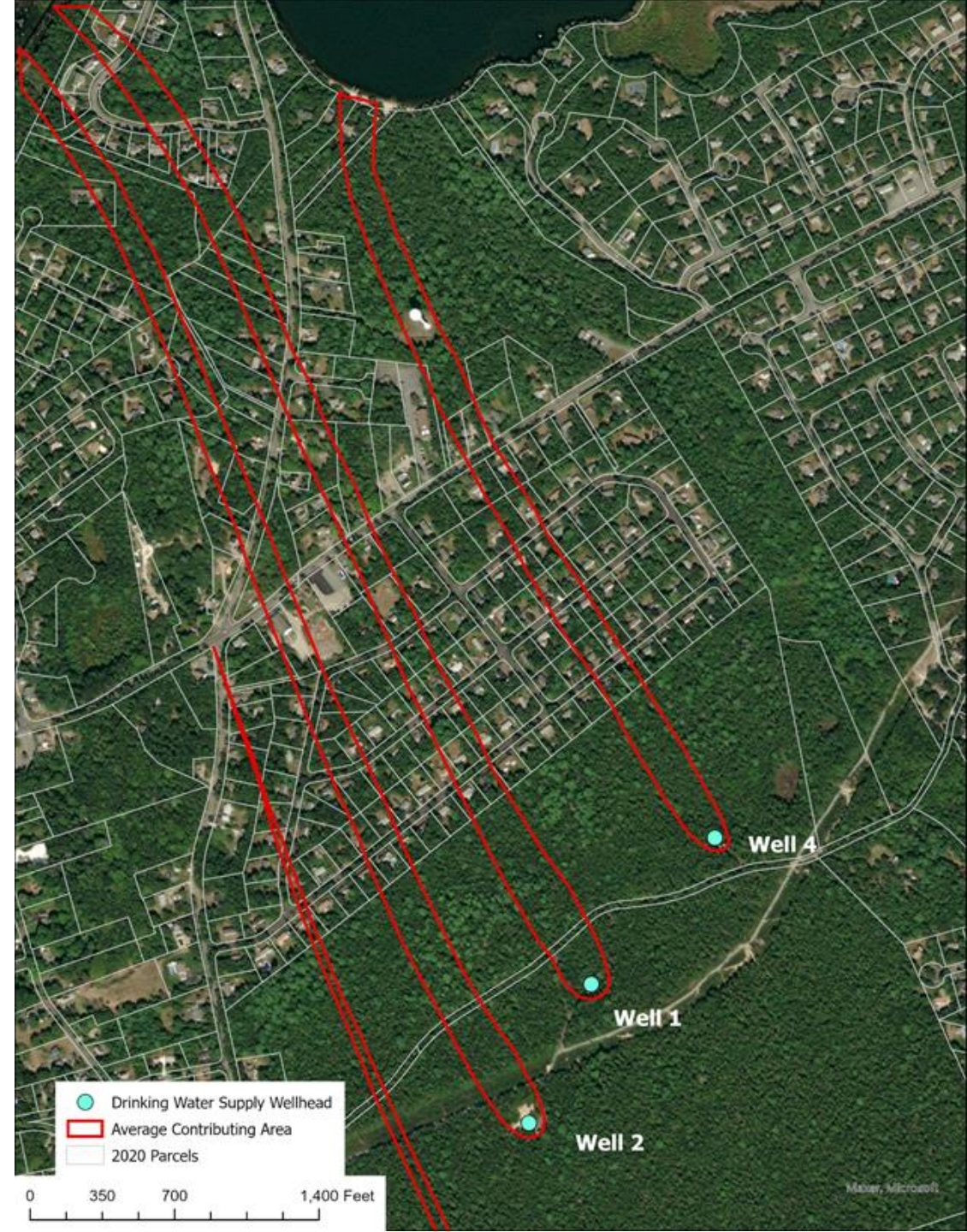
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Option 2: Source Water Protection

- Detailed Mapping of the Cotuit aquifer has been ongoing with Tom Cambereri of Sole Source Consulting
- Test wells have been drilled and sampling had yielded a better understanding of the ground and surface water flows upgradient of the five wells
- Subdivisions constructed in the 1970s and 80s placed a dense number of Title 5 septic systems directly upgradient of all 5 wells within zone 2.
- Prior testing has detected the presence of pharmaceuticals in Cotuit water, and rising nitrate levels have been correlated with PFAS contamination emanating from household septic systems in past research studies
- Solution: prioritize the upgrade of private septic systems with the highest impact on the well field





Source Water Protection

Zones of Contribution to Wells change relative to pumping rate

- A warrant article to expand the authority of the Water Commission to enhance water quality near the well fields by upgrading septic systems will go before the fire district at its annual meeting this May
- The board of water commissioners has met with Representative Kip Diggs, 2nd Barnstable to discuss the issue
- The board will present the Source Water Protection plan to the Cotuit-Santuit Civic Association on April 16 at Freedom Hall



0.3 MGD (current winter pumping)



1.1 MGD (current summer pumping)



Thank You
Questions?