

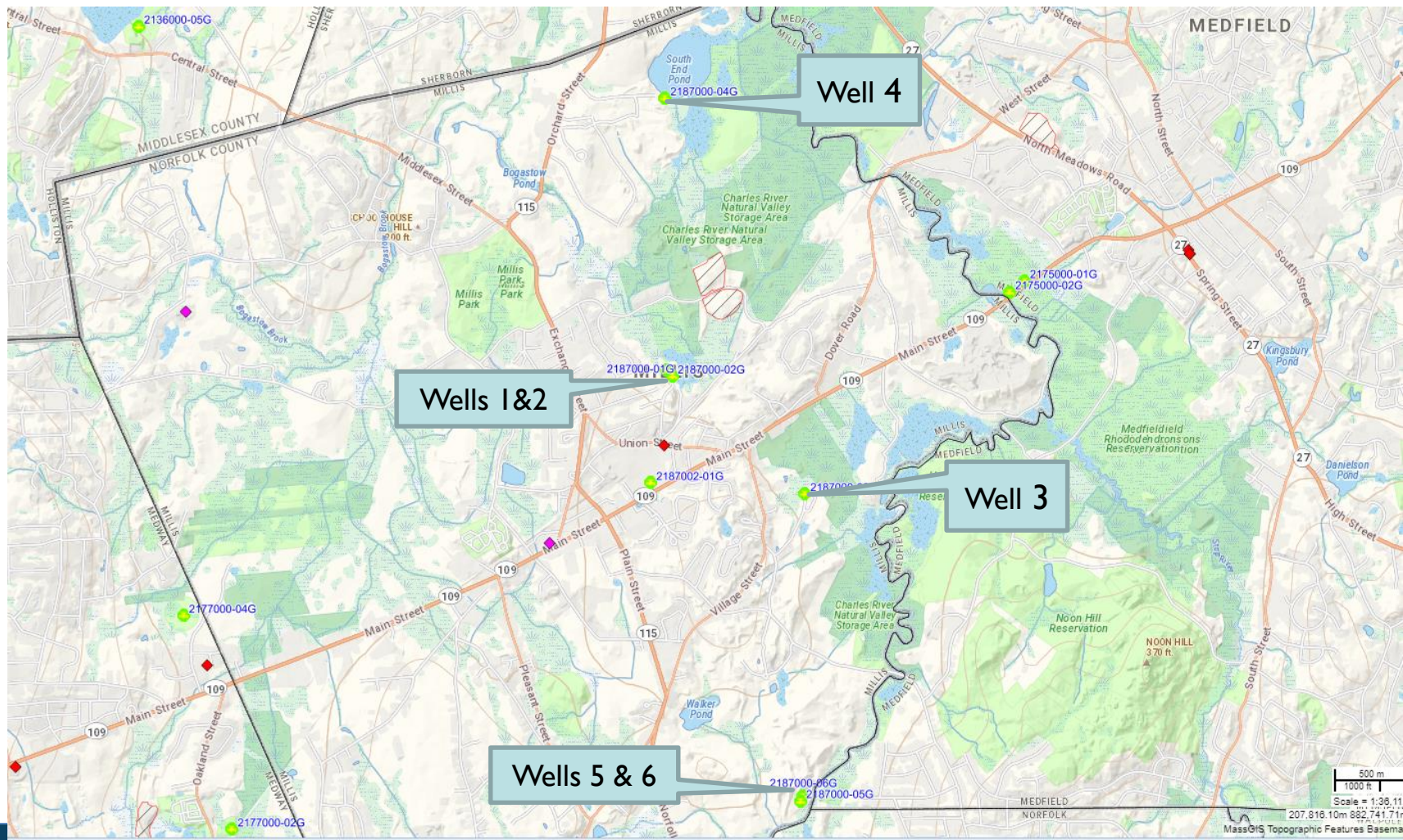
# Impact of PFAS on Millis Supply Wells & Potential Solutions – Update February 2021

Town of Millis Enterprise Committee, Feb 11, 2021

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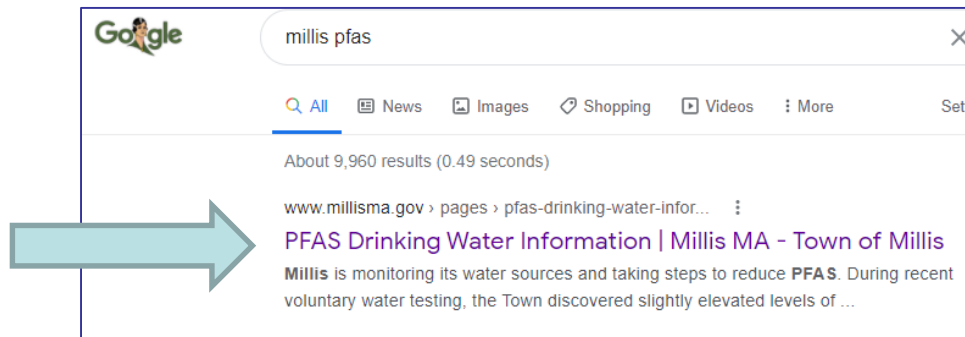


# Impact of PFAS on Millis Supply Wells & Potential Solutions – Update February 2020



# What are PFAS?

## More info and FAQs:



<https://www.millisma.gov/public-works-highway-department/pages/pfas-drinking-water-information>



A screenshot of the Town of Millis website. The header features the Town of Millis logo and the text "Town of Millis Massachusetts". Below the header is a navigation bar with links: Home, About Millis, Departments, and Boards & Committees. A search bar and an "E-Subscribe" button are also present. The main content area is titled "PFAS and Drinking Water Information and Frequently Asked Questions". It includes a section for "PFAS Drinking Water Information" and a "PFAS Frequently Asked Questions" section. A sidebar on the left lists various town documents and reports. A large red graphic of a water faucet is visible on the right side of the page.

**PFAS and Drinking Water Information and Frequently Asked Questions**

The Town of Millis is committed to providing reliable, high-quality drinking water that meets all state and federal safety standards.

to expand upon the information in the mailer sent October 8, 2020. There may be some documents, as information and guidance we receive from MassDEP is subject to change.

Summer 2020, Millis conducted voluntary, proactive water testing for the presence of PFAS (per- and polyfluoroalkyl substances). One of the D'Angelis Water Treatment Plant, located at 7 Water St., tested for levels of PFAS6 – a set of six PFAS compounds\*. The detected levels of PFAS6 were just above the newly published MassDEP MCL (Maximum Contaminant Limit, or MCL) of 20 ng/L, but a regulatory violation was not. **As a precaution, the Water Department removed the D'Angelis Water Treatment Plant from service upon receiving the results. The D'Angelis Plant remains offline while Millis tests all of our other wells meet the standard, with test levels below the MCL, and we will continue to monitor the situation.**

PFAS are a group of numerous human-made chemicals used since the 1950s to manufacture stain-resistant,



# Impact of PFAS on Millis Supply Wells - Update

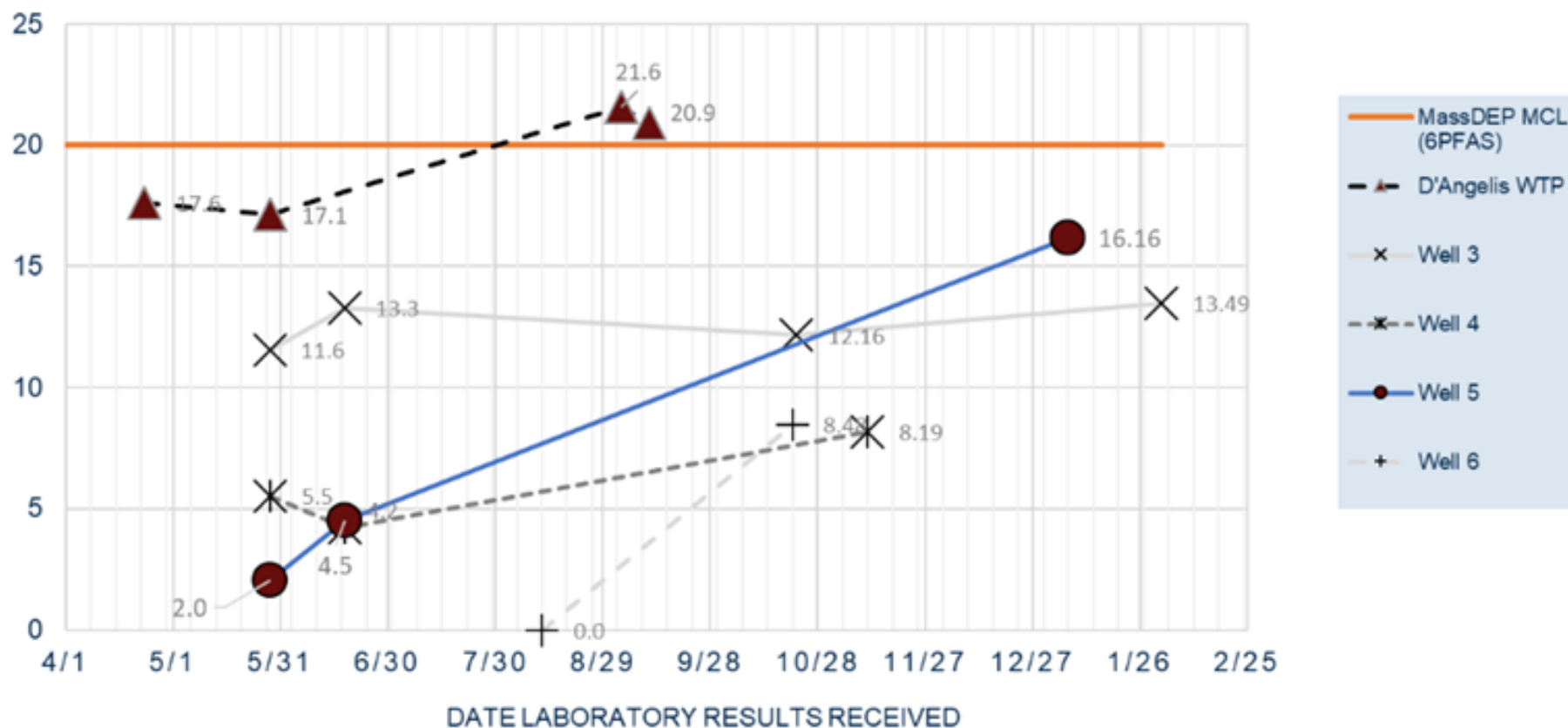
- PFAS6 new drinking water regulation of 20 parts per trillion (ppt) (also expressed as nanograms per liter, ng/L)

6 supply wells in Millis:

- 2 wells above 20 ng/L are offline (Wells 1 & 2)
- 2 wells above 10 ng/L (Wells 3 and 5)
  - Must be sampled monthly
- Wells 4 and 6 slightly below 10 (~8 ng/L)

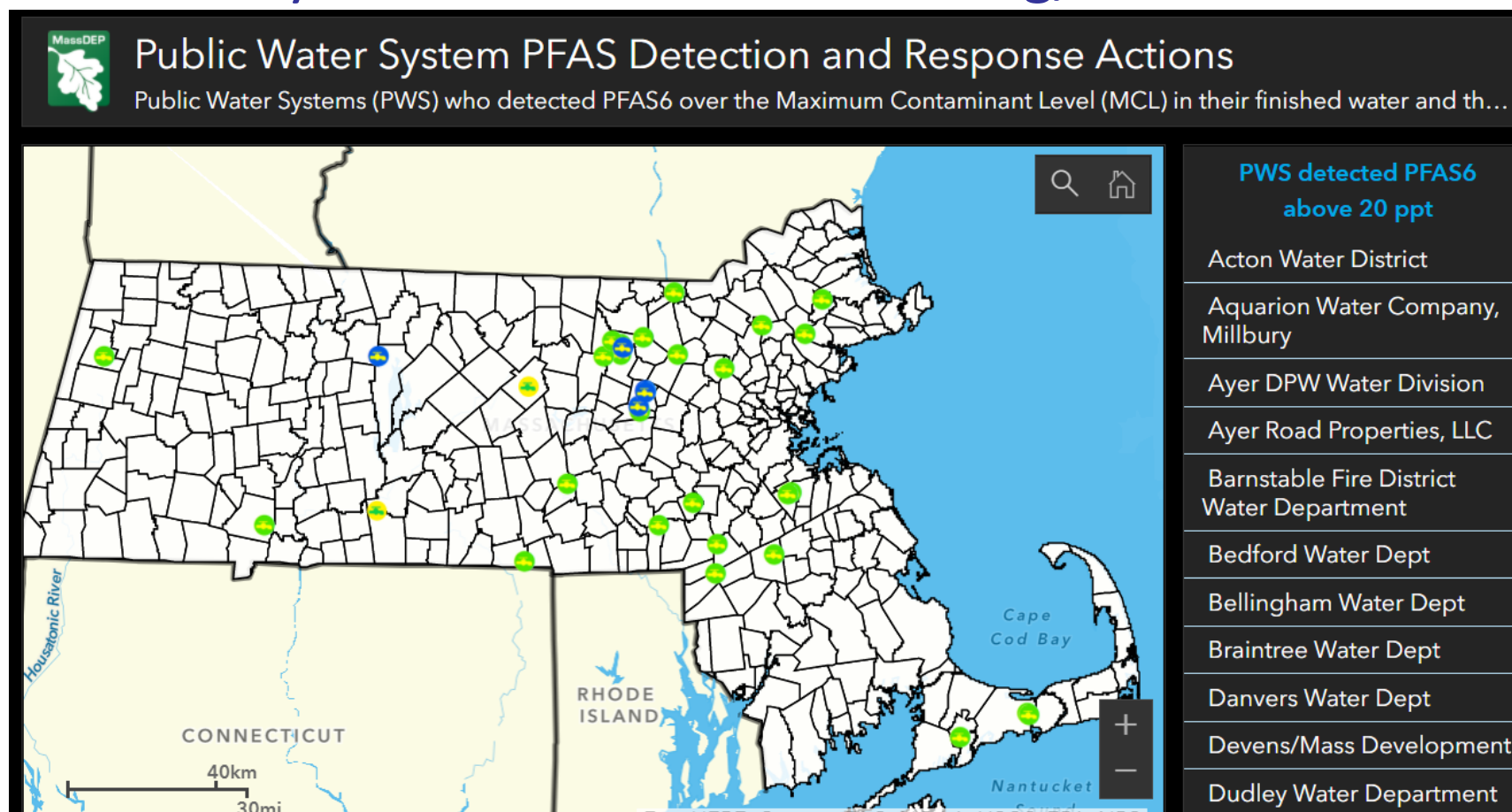
# Millis PFAS Update

- All wells show increasing concentrations over time



# Millis PFAS Update

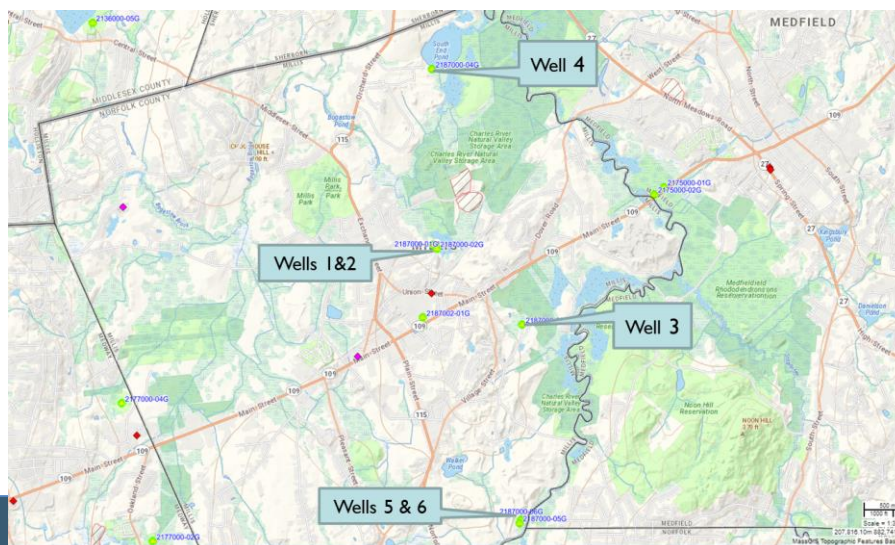
- 36 water systems with PFAS over 20 ng/L in MA



# Millis PFAS Update

- PFAS Sources are unknown and may be varied
  - Industry, fire protection, agriculture, landfills, septic systems, ambient rainfall / groundwater ??
- Industrial sites have been ordered to investigate by MassDEP (60 Curve Street; 114 Union Street)
- Millis could potentially be facing loss of both Wells 1 & 2 and Wells 5 & 6

***Millis needs to be prepared to move quickly to design and install treatment for at least one site***



# Millis PFAS Update

## D'Angelis WTP Treatment Solutions – Preliminary Evaluation:

- Wells 1 & 2 Existing Conditions
- PFAS Removal Technologies
- Site Specific Considerations
- Emergency /Interim vs Permanent Solutions
- Planning Level Costs
- Timeframe
- Town-wide Treatment Study



# Millis PFAS Update

## D'Angelis WTP Treatment Solutions

- Wells 1 & 2
- Existing conditions

| Well   | Pump Capacity (GPM) | Typical Run Time Hours (Summer/ Winter) | MassDEP Permitted Withdrawal (MGD) |
|--------|---------------------|---|------------------------------------|
| Well 1 | 500                 | 6 / 8                                   | 0.72                               |
| Well 2 | 325                 | 6 / 8                                   | 0.5                                |
| Total  | 825                 | ---                                     | 1.22                               |

| Contaminant                 | Unit | Data                   | Regulatory Limit or Guideline (g) | Well 01 | Well 02 | Finished |
|-----------------------------|------|------------------------|-----------------------------------|---------|---------|----------|
| Sodium                      | mg/L | Average 2018-2019      | 20 (g)                            | ---     | 76.3    | 57.6     |
| Chlorides                   | mg/L | Average 2018-2019      | 250 (g)                           | ---     | ---     | 146      |
| PCE (tetra-chloroethylene)* | ug/L | Average 2008-2019      | 5                                 | 0.96    | 1.05    | < 0.5    |
| TCE (tri-chloroethylene)*   | ug/L | Average 2008-2019      | 5                                 | 2.29    | 5.19    | < 0.5    |
| DCE (1,2 dichloroethane)*   | ug/L | Average 2008-2019      | 5                                 | 0.61    | 0.68    | < 0.5    |
| PFAS6                       | ng/L | Average 8/12 & 8/27/20 | 20                                | 16.8    | 29.3    | 21.2     |

# Millis PFAS Update

## D'Angelis WTP Treatment Solutions

- PFAS Removal Technologies

Most commonly used for municipal groundwater treatment:

- Granular Activated Carbon (GAC)
- Ion Exchange (IX)



*GAC contactors being installed in Barnstable*

# D'Angelis WTP – GAC is preferred technology

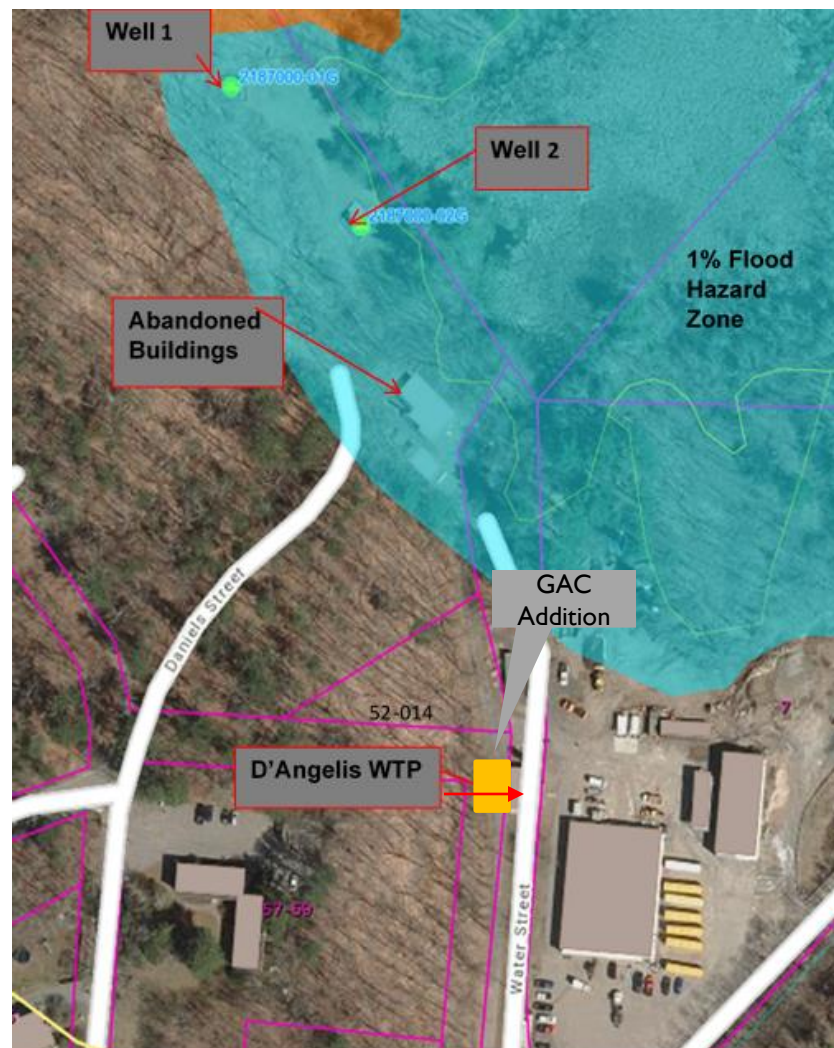
|  | Advantages  | Disadvantages  |
|--|---|--|
| <b>Granular Activated Carbon (GAC)</b> | <ul style="list-style-type: none"> <li>• Will remove PFAS and VOCs</li> <li>• Lowest equipment capital cost (typically)</li> <li>• Use with existing well configuration</li> <li>• Eliminates the need for air stripper</li> <li>• No water quality conflicts as with IX</li> </ul> | <ul style="list-style-type: none"> <li>• Larger footprint than IX</li> </ul>   |
| <b>Ion Exchange (IX)</b>               | <ul style="list-style-type: none"> <li>• Removes PFAS</li> <li>• Smaller footprint/ building costs compared with GAC</li> </ul>   | <ul style="list-style-type: none"> <li>• Does not remove VOCs- Will still need to operate air stripper</li> <li>• Will further elevate chloride levels and potentially lead to distribution system corrosion issues</li> </ul> |

# Millis PFAS Update

## D'Angelis WTP Treatment Solutions

### Site Specific Considerations:

- GAC units: 4 contactors, 10' diam
- 40 x 40 ft building
  - Addition or annex?
  - Subsurface information?
  - Hydraulics / backwash needs?
- Pilot testing





# Millis PFAS Update

## D'Angelis WTP Treatment Solutions

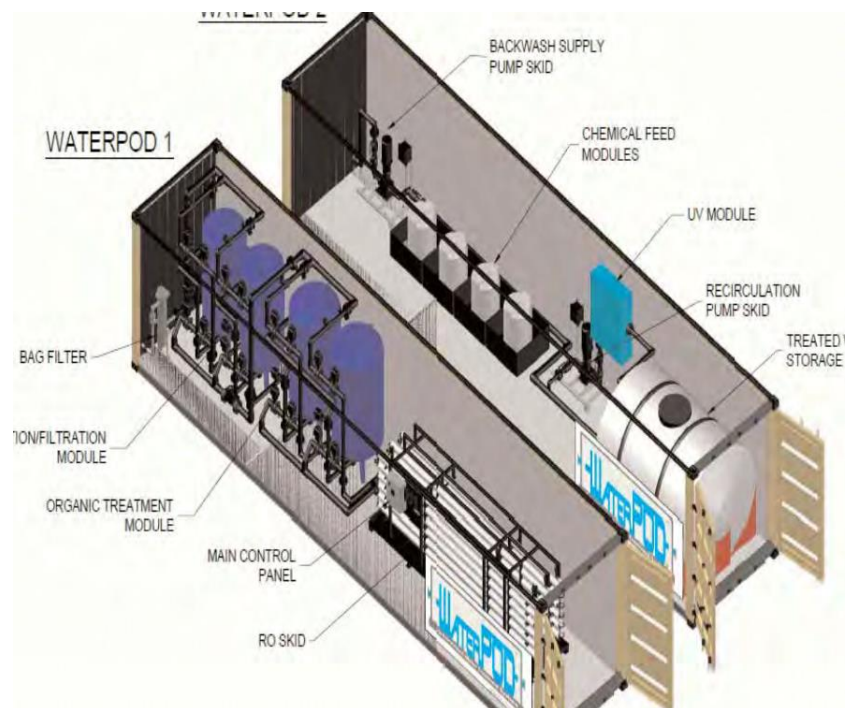
- Costs
  - Capital Cost (non-emergency schedule): ~\$3.5M
- Expected Timeframe
  - 6 months design
  - 6 months construction



# Millis PFAS Update

## D'Angelis WTP Treatment Solutions

- Emergency / Rental Solutions
  - Mobile package units
  - Limited options w/ DEP approval
  - High up-front costs ~\$200,000 +/-
  - Monthly rental ~\$10,000
  - Quick to deploy (weeks)



# Millis PFAS Update

## D'Angelis WTP Treatment Solutions

- Emergency Solutions (Temp- to Perm)
  - Accelerated design-build
  - Overdesign components to overcome uncertainty
  - Temporary shelter / winterization may be needed
  - Emergency procurement / approvals
  - Could still take ~4-6 months

# Questions?