

Presentation on
PFAS

By Vincent Roy, Executive Director
Sudbury Water District

Introduction

- *What is PFAS?*
- Per-and polyfluoroalkyl substances (PFAS) are a family of nearly 15,000 synthetic chemicals containing carbon and fluorine that are found in ground and surface water throughout the world.
- Unique characteristics of PFAS: thermal and chemical stability, water resistance, stain resistance, and their surfactant nature,
- Most widely known compounds: perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA).

Discovery and Manufacturing

- PFAS chemistry was discovered in the late 1930s. Since the 1950s, many products commonly used by consumers and industry have been manufactured with PFAS compounds.
- Industry Applications include: aerospace, semiconductor, medical, automotive, construction, electronics, aviation, and firefighting applications,
- Consumer products: carpets, clothing, furniture, outdoor clothing and equipment, food packaging, non-stick cookware, and more.

Emerging Health and Environmental Concerns

Awareness of Public Health Impacts

- Awareness of PFAS: can be attributed to occupational studies in the 1970s that found detections of some PFAS in the blood of exposed workers.
- Studies in the 1990s that reported detections in the blood of the general human population.

Emerging Health and Environmental Concerns

Awareness and Detection in the Environment

- PFAS were not widely documented in environmental samples until the early 2000s.
- Since the 2000s, methods have been, and continue to be, developed with lower detection limits in water that correlate with potential human health effects.

Emerging Health and Environmental Concerns

Phaseout of Long-Chain PFAS

- Concerns about the potential health and environmental impacts, there has been a reduction in the manufacture and use of certain long-chain PFAS compounds.
- PFAS are manufactured globally, and recently increased international production of PFAS have potentially offset the global reduction anticipated with the U.S. phaseout.
- Phaseout efforts: do not prevent the import of materials containing PFAS to the United States.

Emerging Health and Environmental Concerns

Replacement Chemistry

Manufacturers have been developing replacement technologies, including reformulating longer-chain substances or substituting them with nonfluorinated chemicals, alternate technologies, or shorter-chain PFAS substances.

Emerging Health and Environmental Concerns

PFAS in Drinking Water

- PFAS are water soluble, over time PFAS from some firefighting foam, manufacturing sites, landfills, spills, air deposition from factories and other releases can seep into surface soils.
- PFAS can leach into groundwater or surface water and can eventually contaminate drinking water.

Treatment Processes

1. Granular Activated Carbon (GAC)

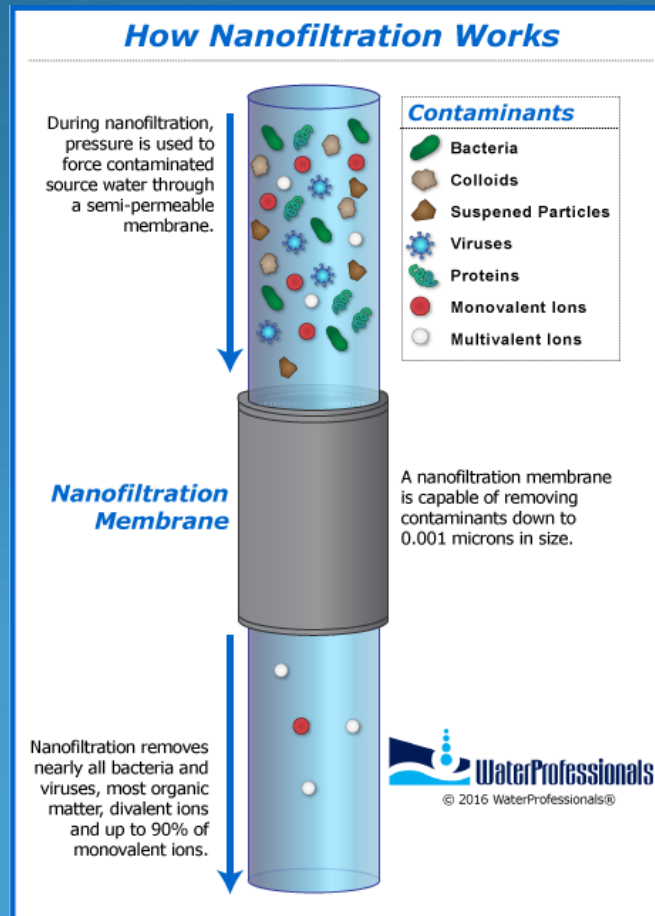


2. ION exchange resins



Treatment Processes

3. High Pressure Membrane filtration or Nanofiltration or Reverse Osmosis



Local History of PFAS

- UCMR 3 (2012-2016) local testing occurred with 179 Public Water Suppliers in Mass. participating in the monitoring program. The results were: (5) systems tested positive for PFAS while (9) water supply sources tested positive. SWD also participated in the monitoring program, our results were ND at that time.
- 2016 – EPA issued an interim Lifetime Health Advisory limit of 70 PPT for PFOS and PFOA.
- Fall of 2019 – MassDEP alerted Sudbury BOH and SWD about the high levels of PFAS concentrations at the State Fire Fighting Academy in Stow.
- January of 2020 – SWD sampled all wells in town for PFAS. Results ranged from 8 to 12 ppt with one well at non detect. Confirmation sampling was conducting the following month.
- Spring of 2020 – SWD hired an engineering consultant to conduct an Emerging Contaminant Response Plan with cost estimates for implementing PFAS treatment at all of the District's water sources.

Local History of PFAS

- 10/2/2020 – MassDEP announced new PFAS regulation for a combined six compounds: PFOA, PFOS, PFHxS, PFNA, and PFDA, MCL of 20 ppt.
- Summer of 2020 – SWD applied for and received a State Grant for \$110,000 for conducting a preliminary design for PFAS treatment at the RRWTP.
- May 2021 – SWD Annual Meeting approved authorization to borrow \$3.5 million thru the SRF program.
- August of 2021 – SWD applied to MassDEP for SRF loan. Approved by the Clean Water Trust in March 2022 for \$3.8 million.
- March 2022 – SWD received an ARPA earmark from the State for PFAS treatment mitigation, thanks to State Rep. Carmen Gentile and State Senator James Eldridge.
- July 2022 – SWD advertised IFB for PFAS Treatment at the RRWTP
- Nov 2022 – SWD Awarded bid contract to Barbato Construction for \$2.8 million.

Local History of PFAS

- May 2023 - SWD Annual Meeting approved authorization to borrow \$4.5 million thru the SRF program. Approved by the Clean Water Trust for \$5.8 million.
- Jan 2024 – SWD advertised IFB for PFAS treatment at the ESWTP
- March 2024 – SWD bid opening for ESWTP PFAS project – lowest bid received at \$5.6 million.
- April 10, 2024 - EPA announced new EPA regulation (MCL) for six PFAS compounds.

New EPA PFAS Regulation Summary

- On April 10, 2024, EPA announced the final National Primary Drinking Water Regulation (NPDWR) for six PFAS compounds.
- EPA expects that over many years the final rule will prevent PFAS exposure in drinking water for approximately 100 million people, prevent thousands of deaths, and reduce ten of thousands of serious PFAS-attributable illness.

New EPA PFAS Regulation Summary

- **The final rule requires:**
 - Public water systems must monitor for these PFAS and have three years to complete initial monitoring (by 2027), followed by ongoing compliance monitoring. Water systems must also provide the public with information on the levels of these PFAS in their drinking water beginning in 2027.
 - Public water systems have five years (by 2029) to implement solutions that reduce these PFAS if monitoring shows that drinking water levels exceed these MCLs.
 - Beginning in five years (2029), public water systems that have PFAS in drinking water which violates one or more of these MCLs must take action to reduce levels of these PFAS in their drinking water and must provide notification to the public of the violation.

New EPA PFAS Regulation Summary

Compound	Final MCLG	Final MCL (enforceable levels)
PFOA	Zero	4.0 parts per trillion (ppt) (also expressed as ng/L)
PFOS	Zero	4.0 ppt
PFHxS	10 ppt	10 ppt
PFNA	10 ppt	10 ppt
HFPO-DA (commonly known as GenX Chemicals)	10 ppt	10 ppt
Mixtures containing two or more of PFHxS, PFNA, HFPO-DA, and PFBS	1 (unitless) Hazard Index	1 (unitless) Hazard Index

PFAS Multi-District Litigation (MDL)

- The District entered into an agreement with a consortium of law firms with national expertise in PFAS litigation and subsequently filed a formal civil complaint in court on November 11, 2021, against manufacturers of aqueous film-forming foam (AFFF) for their involvement in the manufacture and sale of PFAS compounds that have contaminated some groundwater wells within the District's service area. Through this and future legal actions, the District seeks to protect rate payers and mitigate damages caused by 3M, DuPont, and the other companies that sold and profited from their products containing PFAS.

Additional Information

Private Well Owners:

There are home water treatment filters to remove PFAS from drinking water. They can be installed at the point of entry into your home or point of use such as a sink. The most important part of a decision in choosing which filter is looking for the product certification. That certification provides a level of confidence that your purchase will provide the water quality protection that you're looking for.

Bottled Drinking Water:

The Massachusetts Department of Public Health (MDPH) Food Protection Program publishes a list of companies licensed to sell or distribute bottled water or carbonated non-alcoholic beverages in Massachusetts listed on their website.

Raymond Road WTP/PFAS Treatment Facility



Raymond Road WTP/PFAS Treatment Facility



Article 11



Raymond Road WTP/PFAS Project



Thank You!