Maine CDC Drinking Water Program
PFAS: Regulatory Perspective

Michael Abbott, Program Director
Holly Ireland, Rule Specialist
• What we know
• What we don’t know
• What we’re doing about it
What We Know

- Unregulated contaminants
- UCMR3 sampling in Maine (2013-2015)
  - Sanford Water District – inactive well near airport.
    - PFAS removal treatment installed voluntarily.
What We Know

Aqueous Film Forming Foam (AFFF) contamination:
- Sanford Seacoast Regional Airport
- Portsmouth Naval Shipyard (Kittery)
- Brunswick Naval Air Station
- Loring Air Force Base (Limestone)
- Cutler Navy VLF Transmitter Station

Landfills
- Leachate may contain PFAS

Maine CDC – Drinking Water Program
Keep Your Drinking Water Safe
✓ Protect Your Source  ✓ Take Your Samples  ✓ Maintain Your Treatment  ✓ Inspect Your Pipes and Tanks
Drinking Water Program 2017 Sampling:


- Proximity to potential sources of PFAS contamination
  - Based on EPA Region 1 maps

- Limited to:
  - airports
  - fire training areas
  - industrial coating facilities
What We Don’t Know

- Other potential sources of PFAS in Maine?
- Are other public water systems affected?
- Future of Federal or State regulation?
2019 Sampling Program

- Systems close to potential PFAS sources
  - Maine DEP site investigation data
- Systems within ½ mile of sludge utilization sites.
- Schools or Daycares with setbacks 100’ or less from septic leach fields
- Systems within 1,000’ of Landfills
- Inform affected systems and recommend action to reduce PFAS in water.
PFAS Sampling Completed by our Partner Agencies as of November 2018

- Landfills
- Industrial Sites
- Manufacturing
- Residential Sites
- Uncontrolled Sites
- Private Wells
• 3 Systems near Sludge Utilization Sites – all results non-detect

• 2 schools/daycares with septic leach field within 100’ of well – mostly non-detect, with detections of some compounds <20 ppt
3 Systems within 1,000’ of landfill – mostly non-detect with detections of some compounds <20 ppt

1 Superfund Site – all detections <20 ppt

1 Airport – only PFOS detected at <20 ppt
## Treatment Options

### Drinking Water Treatment
- Granular Activated Carbon
- Colloidal Carbon
- Resins (Anion Exchange)
- Reverse Osmosis
- Nano-filtration

### Plume Treatment
- Liquid Activated Carbon
- Thermal Destruction
- Pump and treat
  - Resins
  - Granular activated carbon
<table>
<thead>
<tr>
<th>Compound</th>
<th>M.W. (g/mol)</th>
<th>AER</th>
<th>COAG/DAF</th>
<th>COAG/FLOC/SED/G- or M-FIL</th>
<th>AIX</th>
<th>GAC</th>
<th>NF</th>
<th>RO</th>
<th>MnO₄⁻, O₃, ClO₂, Cl₂, CLM, UV,</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFBA</td>
<td>214</td>
<td></td>
<td></td>
<td>assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFPeA</td>
<td>264</td>
<td></td>
<td></td>
<td>assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFHxA</td>
<td>314</td>
<td></td>
<td></td>
<td>assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFHpA</td>
<td>364</td>
<td></td>
<td></td>
<td>assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFOA</td>
<td>414</td>
<td></td>
<td></td>
<td>assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFNA</td>
<td>464</td>
<td></td>
<td></td>
<td>assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFDA</td>
<td>514</td>
<td></td>
<td></td>
<td>assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFBS</td>
<td>300</td>
<td></td>
<td></td>
<td>assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFHxS</td>
<td>400</td>
<td></td>
<td></td>
<td>assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFOS</td>
<td>500</td>
<td></td>
<td></td>
<td>assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOSA</td>
<td>499</td>
<td></td>
<td></td>
<td>assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-MeFOSAA</td>
<td>571</td>
<td></td>
<td></td>
<td>assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-EtFOSAA</td>
<td>585</td>
<td></td>
<td></td>
<td>assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Treatment Costs

<table>
<thead>
<tr>
<th>Plant Size</th>
<th>Capital Cost</th>
<th>O&amp;M Annual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential System</td>
<td>Up to $5,000</td>
<td>$1,000 - $2,000</td>
</tr>
<tr>
<td>&lt;100,000 gallon/day*</td>
<td>$340,000 - $510,000</td>
<td>$17,000 - $25,000</td>
</tr>
<tr>
<td>0.1 to 0.5MGD</td>
<td>$510,000 - $850,000</td>
<td>$34,000 - $127,500</td>
</tr>
<tr>
<td>0.5 to 1MGD</td>
<td>$1,020,000 - $2,040,000</td>
<td>$85,000 – $170,000</td>
</tr>
</tbody>
</table>

Example of small system estimated cost
*A small community system 100,000 gallons/day, 1,000 people and 300 houses

From Massachusetts DEP 2018
What’s Next?

- Are we headed toward regulation?
  - Governor’s Task Force will generate a report by the end of the year
  - EPA has issued a Health Advisory, but there is still regulatory uncertainty
What’s Next?

• What are other EPA Region 1 States doing?
  
  – Vermont’s health advisory level for the combination of five PFAS (PFOA, PFOS, PFHxS, PFHpA, and PFNA) is 20 ppt (parts per trillion).
  
  – New Hampshire: Proposed MCL and AGQS (Ambient Groundwater Quality Standard for remediation sites) - PFOA 12 ppt, PFOS 15 ppt, PFHxS 18 ppt, PFNA 11 ppt.
What’s Next?

• What are other EPA Region 1 States doing?
  
  – Massachusetts: Announced intention to develop a MCL for PFAS in January 2019
  
  – Connecticut: Governor Lamont established an interagency task force on 7/8/2019
  
  – Rhode Island: Require public water systems to maintain PFAS below the Federal Health Advisory Level
Thank You

Michael Abbott, P.E., C.G.
Holly Ireland, MS, MPH
Maine CDC Drinking Water Program
michael.abbott@maine.gov 207-592-2174
holly.hockertlotz@maine.gov 207-287-1979