PFAS Overview
PER-AND POLYFLUOROALKYL SUBSTANCES
Content

BACKGROUND

USES

EXPOSURE

HEALTH CONCERNS
# Per- and Polyfluoroalkyl Substances (PFAS)

<table>
<thead>
<tr>
<th>What are they?</th>
<th>Why the concern?</th>
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</thead>
<tbody>
<tr>
<td>Human-made</td>
<td>Widespread through the ecosystem</td>
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<tr>
<td>Strong carbon-fluorine bonds</td>
<td>Don’t break down easily – Hard to get rid of</td>
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<tr>
<td>Surfactants</td>
<td>Bioaccumulate – Build up in our bodies</td>
</tr>
<tr>
<td>Highly stable</td>
<td>Some PFAS may affect health</td>
</tr>
<tr>
<td>Repel water, oil, fat, and grease</td>
<td>Some emerging science/information</td>
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<tr>
<td>Began developing in 1940s</td>
<td>Lack of federal standards</td>
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<tr>
<td>Thousands of compounds today</td>
<td></td>
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</table>
PFAS Uses

https://www.sixclasses.org/videos/pfas
<table>
<thead>
<tr>
<th>Compound</th>
<th>Michigan Standards</th>
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</thead>
<tbody>
<tr>
<td>PFNA</td>
<td>6 ppt</td>
</tr>
<tr>
<td>PFOA</td>
<td>8 ppt</td>
</tr>
<tr>
<td>PFOS</td>
<td>16 ppt</td>
</tr>
<tr>
<td>PFHxS</td>
<td>51 ppt</td>
</tr>
<tr>
<td>GenX (HFPO-DA)</td>
<td>370 ppt</td>
</tr>
<tr>
<td>PFBS</td>
<td>420 ppt</td>
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<tr>
<td>PFHxA</td>
<td>400,000 ppt</td>
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</tbody>
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* PPT - Parts per Trillion
Exposure to PFAS Chemicals

- Drinking contaminated municipal or private well water.
- Eating fish caught from water contaminated by PFAS - PFOS in particular).
  - “Eat Safe Fish” Guidelines.
- Accidentally swallowing of contaminated soil or dust.
- Eating food grown or raised near places that used or made PFAS.
- Eating food packaged in materials containing PFAS.
- Using some consumer products such as stain resistant carpeting and water repellent clothing.
- PFAS absorption through skin is typically not a concern. Think foam.
PFAS Foam

• What does naturally occurring foam look like?
  • Is off-white and/or brown
  • Often piles up in bays, eddies, or river barriers such as dams
  • May have an earthy or fishy smell

• What does PFAS foam look like?
  • Can be bright white
  • Is usually lightweight
  • Can be sticky
  • Tends to pile up like shaving cream
  • Can blow onto the beach
Associated Human Health Outcomes
PFOA and/or PFOS

- Reduced fertility
- High blood pressure or pre-eclampsia in pregnant women
  - Small decreases in infant birth weight
- Higher cholesterol
  - Especially total cholesterol and LDL cholesterol
- Thyroid disease
- Liver damage
- Decreased immune system response to vaccines
- Developing certain types of cancer
  - In particular, kidney and testicular cancers*
Role of MDHHS/Local Health Department

- Understand the health concerns facing your community.
- Develop a plan to investigate and address health risks.
  - EGLE leads the site investigation.
  - MDHHS and the Local Health Department lead the public health planning and response.
- Evaluate PFAS exposures to residents in the community.
  - Recommend public health actions as needed.