Michigan’s IPP PFAS Initiative

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Governor Whitmer signed Executive Order 2019-3 on February 4, 2019:

- The Order establishes MPART as an enduring body
- MPART is an advisory body within the DEQ (e.g. DEQ lead)
- Includes the same agencies
- Ensures ongoing, across-agency coordination
- Creates a Citizen Advisory work group
MPART Goals

- Protecting public health
- Investigating areas and reducing exposure
- Assisting responsible parties in remediation efforts
- Working with communities and other agencies
- Implementing proactive efforts

WRD PFAS Work

- Surface Water
  - Ambient water sampling
  - Fish collection
- Wastewater
  - Industrial Pretreatment Program
  - Biosolids
  - Direct industrial discharges
- Landfills
- Sharing with other states and EPA
Michigan Standards

<table>
<thead>
<tr>
<th>Criteria</th>
<th>PFOS</th>
<th>PFOA</th>
<th>PFOS/PFOA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinking Water Health Advisory Level</td>
<td>70 ppt</td>
<td>70 ppt</td>
<td>70 ppt</td>
</tr>
<tr>
<td>Groundwater (used as a drinking water source)</td>
<td>70 ppt</td>
<td>70 ppt</td>
<td>70 ppt</td>
</tr>
<tr>
<td>Soil protective of groundwater (for GSI pathway)</td>
<td>0.24 ppb</td>
<td>10,000 ppb</td>
<td>n/a</td>
</tr>
<tr>
<td>Surface water (drinking water source)</td>
<td>11 ppt</td>
<td>420 ppt</td>
<td>n/a</td>
</tr>
<tr>
<td>Surface water (non-drinking water source)</td>
<td>12 ppt</td>
<td>12,000 ppt</td>
<td>n/a</td>
</tr>
</tbody>
</table>
DEQ Water Quality Criteria for PFAS

- Michigan developed Rule 57 Human Noncancer Values (HNV) for PFOA (2011) and PFOS (2014) in surface waters

<table>
<thead>
<tr>
<th>PFAS</th>
<th>HNV (nondrinking)</th>
<th>HNV (drinking)</th>
<th>FCV, ppt</th>
<th>FAV, ppt</th>
<th>AMV, ppt</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFOS</td>
<td>12</td>
<td>11</td>
<td>140,000</td>
<td>1,600,000</td>
<td>780,000</td>
</tr>
<tr>
<td>PFOA</td>
<td>12,000</td>
<td>420</td>
<td>880,000</td>
<td>15,000,000</td>
<td>7,700,000</td>
</tr>
</tbody>
</table>

Human Noncancer Values (HNVs); Aquatic Life Final Chronic Value (FCV), Final Acute Value (FAV), and Aquatic Maximum Value (AMV)

- PFOS builds up in fish tissue to a higher degree than PFOA

DEQ Fish Contaminant Monitoring

- 40 waterbodies and average 600 samples per year
- ~1,300 fillet samples from 55 waterbodies have been analyzed for PFAS to-date
- Data for DHHS “Eat Safe Fish” guidelines
- *Best indicator of significant source

https://www.michigan.gov/mdhhs/0,5885,7-339-71548_54783_54784_54785---,00.html
Surface Water Sampling for PFAS

- Over 300 ambient surface water samples from 20 waterbodies
  - St. Marys, St. Clair, Detroit Rivers sampled for PFAS in 2017 – PFOS was consistently low
- Seven major watersheds sampled intensively as part of source tracking investigations
  - Kalamazoo River
  - St. Joseph River
  - River Raisin
  - Clinton River
  - Rogue River
  - Huron River
  - Flint River
  - Grand River - 2019
2017 Flint River/Lapeer

- 2013/2016 Elevated levels in Flint River
- Restrictive fish consumption advisories due to PFOS
- Source tracked back to Lapeer WWTP
- Industrial User – chrome plater
- High PFOS effluent and biosolid concentrations
- Biosolid application – impact to resources?

2018 Industrial Pretreatment Program PFAS Initiative

- 95 Wastewater Treatment Plants with IPPs
  - Screen industrial users for PFAS
  - Sample users and effluent
  - Control/reduce discharges
  - Monitoring
NPDES Requirement:
Industrial Pretreatment Program (IPP)

• **Industrial Pretreatment Program** – A federally-mandated program to control industrial discharges into POTWs to protect the WWTP operations and the environment.

• **IPP is REQUIRED** when a POTW has significant industrial users such as metal finishers, chemical plants, etc.

• **Must** prevent pass through, harmful interference or impairment to ability to manage solids from industrial pollutants

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**IPP PFAS Initiative**

• February 2018 – POTWs required to screen Industrial Users
  – Survey Industrial Users with potential sources of PFAS
  – Follow-up sampling of probable sources
  – Sample POTW effluent if sources above screening criteria (12 ppt PFOS)
  – Interim Reports due **June 29, 2018** unless extension requested
    • 35 extension requests
  – Summary Reports due **October 26, 2018** unless extension

Additional information on IPP PFAS Initiative:
https://www.michigan.gov/pfasresponse/0,9038,7-365-86510---,00.html
IPP PFAS Initiative

WRD Compliance Assistance and Outreach Activities

- Recommended Screening & PFAS Evaluation Procedures
- Wastewater PFAS Sampling Guidance
- FAQs
- Regional Informational Meetings
- Multiple meetings, presentations to stakeholders

Sources PFAS to WWTPs found (so far)

**Metal Finishers:** Significant sources **16 - 240,000 ppt PFOS**
Of ~248 Metal Finishers in Michigan,
- **53** with PFOS > WQS
- Of these, **39** with PFOS ≥ 50 ppt

- Primarily Decorative & Hard Chrome Platers using fume suppressants (Cr +6)
- Some Anodizing (Chrome conversion coatings, fume suppression (sulfuric acid), Teflon coating?)
- Also, groundwater from former plating sites (infiltrating to sanitary sewers or groundwater cleanup sites)
Sources PFAS to WWTPs found (cont’d)

- Sites where AFFF used (Air Force Bases, refineries, fire stations, etc.): PFOS 240 - 45,000 ppt
- Paint manufacturers/former sites: PFOS 6,047 ppt
- Landfill leachate: PFOS non-detect - 4000 ppt
- Paper Mfg/former sites: PFOS 20 - 150+ ppt
- Centralized Waste Treaters (CWTs): PFOS 13 - 650 ppt
- Industrial Laundry facilities: PFOS 29 - 50 ppt
- Medical Products (implants, patches, tubing): 25 ppt

Source Control

- Cleaning & Replacing tanks/equipment/scrubbers
  - Some reductions
- Treatment – Granular Activated Carbon
  - Significant Reductions
  - Maintenance Concerns/issues
    - High costs
    - Sample results lag – miss breakthrough?
    - Metals such as iron interfere with GAC
    - Use of PFOS replacement products (PFAS) – burn through carbon quicker?
- Pollutant Minimization Plans and local limit development
PFAS IPP Findings

95 POTWs with IPPs:
- 94 IRs* Submitted
- 1 IR Overdue

*IR = Interim Report

Bin 1: 93
No sources PFOS/PFOA found

Bin 2: 26
Sources found but POTW Effluent SWQS

Bin 3: 22
Sources found and POTW Effluent SWQS

Bin TBD: 3
Interim Report submitted but a bin determination cannot be made as staff have not yet reviewed the report, the report was determined to be incomplete, or sample results (from IU and/or POTW effluent) are still pending

IPP PFAS Initiative Status Update 4-11-2019

PFOS Reduction After IU Pretreatment

Wixom WWTP Effluent Results

GAC Unit Installed at IU

EGLE
PFOS Reduction After IU Pretreatment

**Lapeer WWTP Effluent Results**

- GAC Installed at IU
- Modified GAC Unit Installed at IU

**Bronson WWTP Effluent Results**

- GAC Unit Installed at IU

EGLE
PFOS Reduction After IU Clean/Replace

Ionia WWTP Effluent Results

PFOS Reduction After IU Pretreatment

Howell WWTP Effluent Results
Michigan Waste and Recycling Association (MWRA)
PFAS Landfill Leachate Project
Technical Report

- Joint effort between DEQ/WMRPD and MWRA (Landfill Industry Group)
- Leachate Collection and PFAS analysis from 35 active landfills & cells
- PFOS and PFOA data reported and tabulated by landfill
- Comparison of data to national and international studies
- Broad-brush Study: Not an analysis of the impact of leachate on specific WWTPs
- Does not assess closed landfills/cells or groundwater

MWRA Findings

Table 4-3
Michigan vs. Worldwide PFOA and PFOS Leachate Concentrations Ranges

<table>
<thead>
<tr>
<th>Region</th>
<th>PFOA (ppt)</th>
<th>PFOS (ppt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michigan*</td>
<td>16 to 3,200</td>
<td>9 to 960</td>
</tr>
<tr>
<td>United States</td>
<td>30 to 5,000</td>
<td>3 to 800</td>
</tr>
<tr>
<td>Europe</td>
<td>ND to 1,000</td>
<td>ND to 1,500</td>
</tr>
<tr>
<td>Australia</td>
<td>17 to 7,500</td>
<td>13 to 2,700</td>
</tr>
<tr>
<td>China</td>
<td>281 to 214,000</td>
<td>1,150 to 6,020</td>
</tr>
<tr>
<td>Worldwide Range</td>
<td>ND to 214,000</td>
<td>ND to 6,020</td>
</tr>
</tbody>
</table>

* Based on leachate analyses from 32 MWRA-member landfills participating in this statewide study and leachate data obtained on MIWaters.com.
For IPP WWTPs:
- PFOS/PFOA monitoring
  - Bin 1: 4x/5 yrs (w/additional monitoring requirements)
  - Bin 2: 2x/yr
  - Bin 3a: 4x/yr
  - Bin 3b: 12x/yr
- PMPs for PFOS/PFOA
  - Bin 3: all
  - Bin 2: upon trigger
  - Reporting may overlap w/IPP requirements

Direct Dischargers & PFAS
- WRD Monitoring
- Probable PFOS Sources
- Some Sources found
- Consent Order Process (Interim Step)
- Later, NPDES Permit with Monitoring, PMP
- Treatment installed at several locations
Statewide Biosolids Study

- Sample Effluent, Influent, & Biosolids from 41 WWTPs
- Oct – Nov 2018
- 20 Largest
- 3.0 – 9.0 MGD (8 WWTPs)
- 0.5 – 3.0 MGD (8 WWTPs)
- 0.2 – 0.4 MGD (5 WWTPs)
- Various treatment processes
- Some w/ no industrial users
- Screen select fields from WWTPs with high conc. of PFOS in biosolids
  - Spring 2019
  - Wixom, Ionia and Bronson
  - Revisit City owned field in Lapeer (complete)
  - Follow-up based on results
- Sample fields from WWTPs with “typical/low” PFOS concentrations in biosolids
- Identify data gaps
  - In lieu of criteria, develop guidance to assist with biosolids management decisions

2018 Statewide Study

WWTP Influent and Effluent Data
2018 Statewide Study
WWTP Influent and Effluent Data

Statewide Study - WWTP Stabilized Sludge/Biosolids PFOS Results
PFAS in Sludge /Biosolids - When is it considered industrially impacted?

*No regulatory Limit - Looking to EPA to lead*

- WWTP’s biosolids/sludge w/highly elevated PFOS concentrations
- WRD determination – suspension of residual management program
- Determination whether “industrially impacted” is based on a number of factors
  - Review of land application studies with high PFAS concentrations (Decatur, Alabama)
  - Literature review of known concentrations of PFAS in biosolids
MDEQ concentrations from 2018 statewide study and excludes industrially impacted solids that are no longer being land applied.

Land Application Site Screening

- Field selection procedure to prioritize fields for screening
- April 2019 – Field Screening
  - Land App sites used by WWTPs with high PFOS concentrations
  - Revisit City owned field in Lapeer (complete)
  - Land app sites used by WWTPs with low/typical PFOS concentrations ranges
  - Soils, drain tiles, swales, surface waters
  - Follow-up if necessary
Biosolids – Next Steps

- Compile / analyze results from IPP initiative and the statewide WWTP biosolids sampling
- Continue Biosolids MPART / stakeholder group meetings
- Land Application Site investigations, compile / analyze results
- Develop guidance for land application of biosolids

www.Michigan.gov/PFASresponse
Michigan Department of
Environment, Great Lakes, and Energy

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www.Michigan.gov/EGLE

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