MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

Michigan's Management of PFAS in Wastewater Treatment Plants and Associated Biosolids

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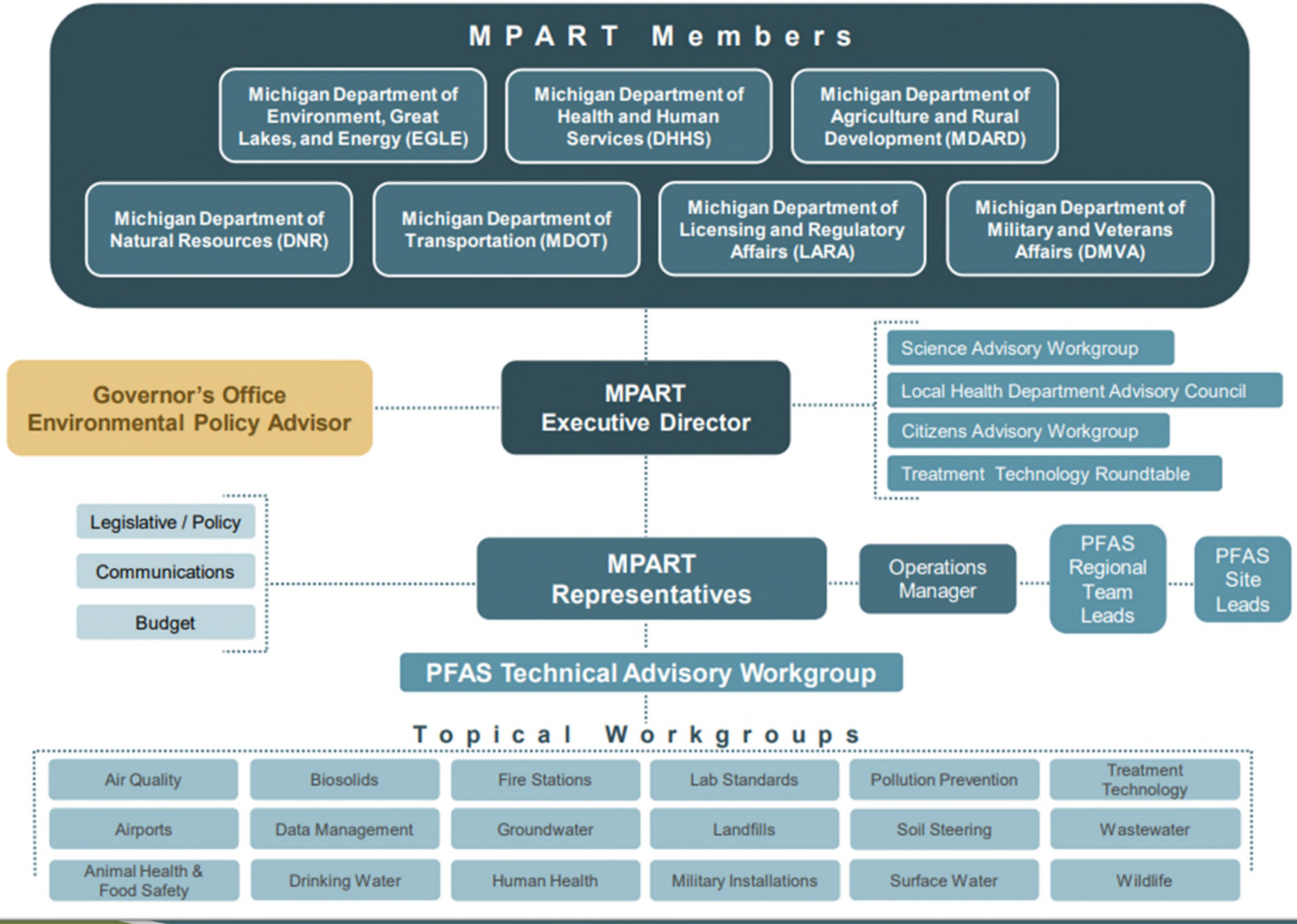
Agenda

- Michigan's PFAS Action Response Team (MPART) Overview
- Michigan's Water Resources Division PFAS Strategies Overview
- Surface Water & Groundwater PFAS Criteria
- IPP PFAS Initiative
- Municipal NPDES Permitting Strategy for PFOS and PFOA
- Land Application of Biosolids Containing PFAS Interim Strategy
- Additional Information Links

MPART Coordination Structure



Michigan PFAS Action Response Team

Health | Drinking Water and Wells | Investigations and Sites | Workgroups | Fish and Wildlife | Public Engagement | Frequently Asked Questions | About MPART

Michigan PFAS Action Response Team (MPART)

The Michigan PFAS Action Response Team (MPART), is a unique, multi-agency proactive approach for coordinating state resources to address per- and polyfluoroalkyl substances (PFAS) contamination. Agencies responsible for environmental protection, public health, natural resources, agriculture, military installations, commercial airports, and fire departments work together to ensure the most efficient and effective response.

Per- and polyfluoroalkyl substances (PFAS) are a large group of man-made chemicals that include perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). PFAS have been used globally during the past century in manufacturing, firefighting and thousands of common household and other consumer products. These chemicals are persistent in the environment and in the human body – meaning they don't break down and they can accumulate over time.

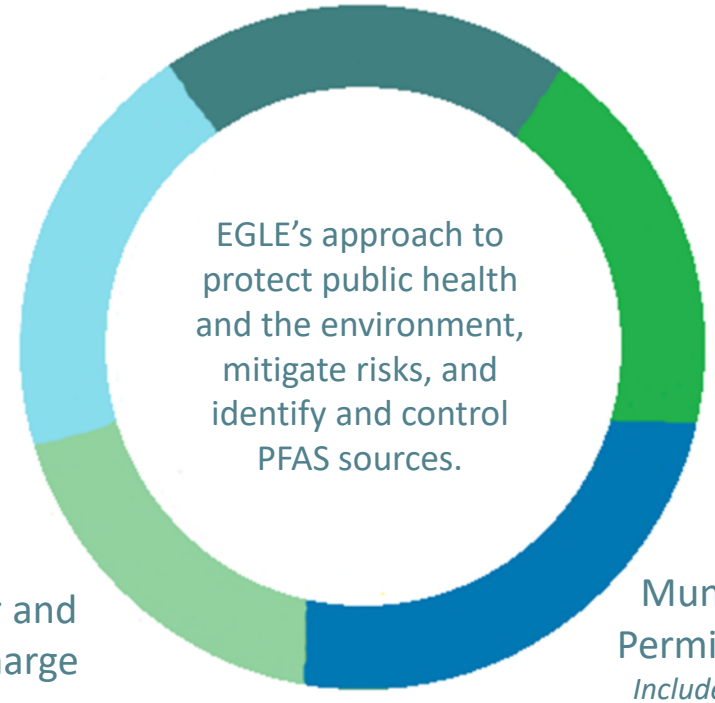
MPART FY2022 Fast Facts

In FY2022, the Michigan legislature supported the PFAS response by appropriating funding across the 7 state agencies that make up MPART. Learn more about the impact of that funding.

Water Resources Division: PFAS Strategies

Industrial Pretreatment Program PFAS Initiative:
Required all IPP WWTPs to conduct PFAS source investigation.

Public and Private Municipal Groundwater Discharges Compliance Strategy:
Outlines how EGLE will prioritize, evaluate, and address PFAS from municipal groundwater discharges.



Land Application of Biosolids Containing PFAS Interim Strategy:
Requires all WWTPs to sample for PFAS prior to land application.

Industrial Stormwater and Industrial Direct Discharge Strategy:
Requires PFAS characterization and mitigation of discharges to surface water and groundwater.

Municipal NPDES Permitting Strategy:
Includes PFOS and PFOA monitoring in municipal NPDES permits.

PFAS Criteria in MI – Surface Water

Natural Resources & Environmental Protection Act (NREPA) - Part 31

PFAS	HNV (drinking)	HNV (nondrinking)
PFOS	11 ppt	12 ppt
PFOA	66 ppt	170 ppt
PFBS	8,300 ppt	670,000 ppt

HNV = Human Noncancer Value

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PFAS Criteria in MI – Groundwater

- Natural Resources & Environmental Protection Act (NREPA) - Part 201
  - Currently have 2 IPP WWTPs discharge to groundwater

PFAS	Groundwater Protection Criteria
PFOA	8 ppt
PFOS	16 ppt
PFNA	6 ppt
PFHxA	400,000 ppt
PFHxS	51 ppt
PFBS	420 ppt
HFPO-DA (GenX)	370 ppt

Industrial Pretreatment Program PFAS Initiative

- February 2018 – 95 WWTPs required to screen Industrial Users
  - Evaluate Industrial Users with potential sources of PFAS
  - Follow-up sampling of probable sources if found
  - Sample WWTP effluent if sources > screening criteria (12 ppt PFOS)
  - Sample WWTP biosolids if WWTP effluent ≥ 50 ppt PFOS
  - Reports submitted 2018-2019
  - Ongoing Monitoring and Reporting for WWTPs that found PFOS

*As of November 2022, 99 WWTPs have participated in Initiative

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Findings: Sources of PFOS - Number by Type

Industry/Category/Type	Total Number Evaluated[1]	Number (%) Sources of PFOS by Type[2]	Range Effluent PFOS exceeding screening level of 12 ppt
Landfills that accepted industrial wastes containing PFOS	**56**	**49 (88%)**	**13-5,000**
Metal Finishing w/history of fume suppressant use	**327**	**48 (15%)**	**13-240,000**
Contaminated Sites associated with industries or activities w/PFOS use	**40**	**20 (50%)**	**14-34,000**
Centralized Waste Treaters (CWTs) accepting PFOS-related wastes	**16**	**12 (75%)**	**13-8,400**
Paper Manufacturing, Packaging	**14**	**9 (64%)**	**16-410**
Commercial Industrial Laundries	**14**	**7 (50%)**	**24-98**
Chemical Manufacturers	**17**	**4 (24%)**	**18-4,600,000**
AFFF-contaminated Sewers	**5**	**5 (100%)**	**12-45,000**

1Estimated based on 2018 WWTP IPP Annual Report data for total metal finishers; others estimated based on industries surveyed and/or sampled during the IPP PFAS Initiative. Number of types per subcategory may be low since sewer users that did not meet local screening criteria may not have been sampled. The information presented in this document has been compiled from many sources including, but not limited to, compliance submittals, laboratory reports, voluntary surveys, emails, internet searches and personal communications. These sources contained variable levels of detail. This document represents our best effort to compile, organize, and summarize this information at this point in time.

[2]*Sources* are those exceeding the screening level of 12 ppt PFOS at least once.

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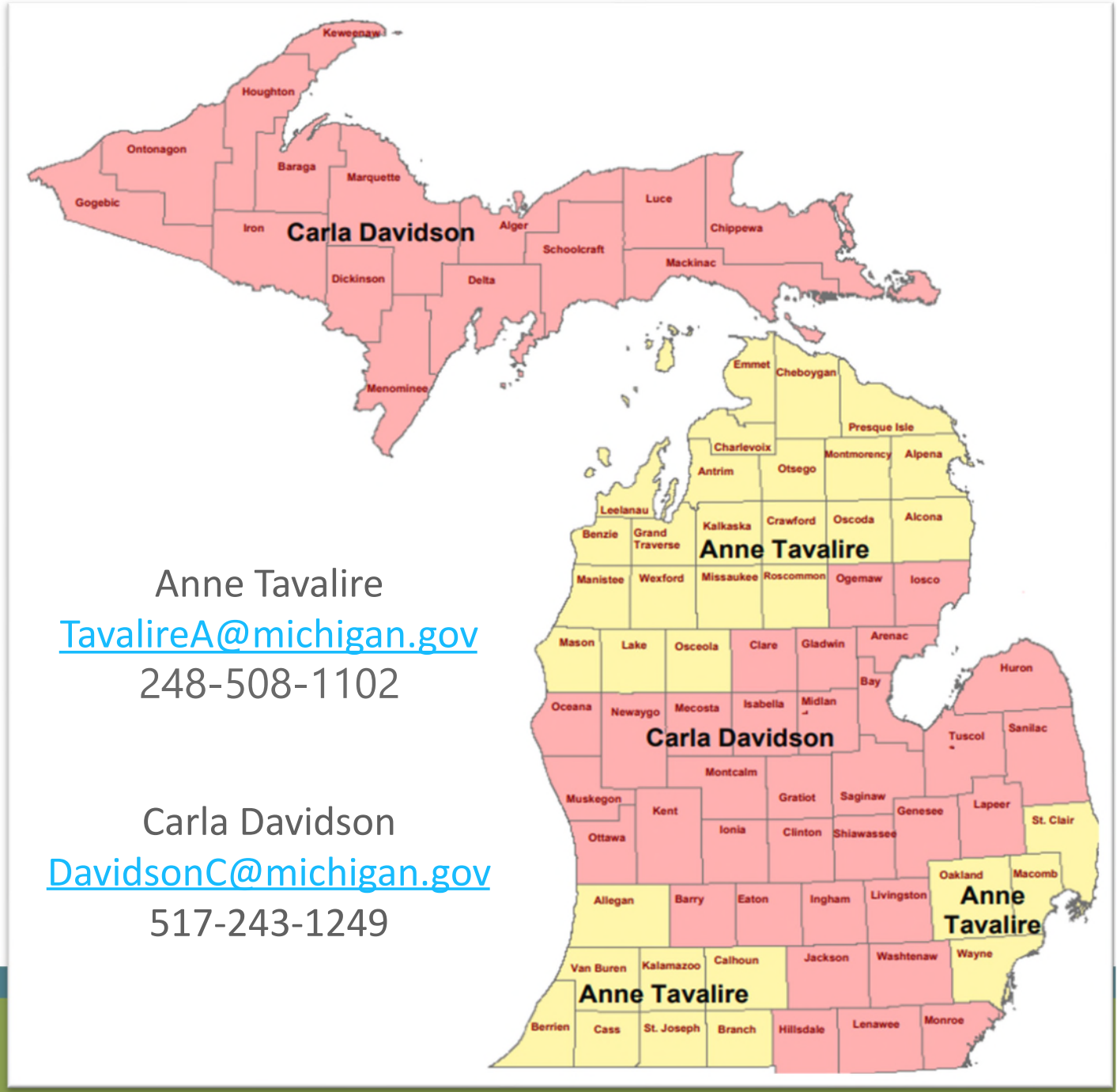

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Municipal WWTPs*
NPDES PFAS Permitting Strategy

- **Effluent Limits for PFOS and PFOA**
  - Permits issued after **October 1, 2021**
  - Monitoring first 4 years (+2?) to achieve compliance with PFOS/PFOA limits.
  - Corrective Action Plans in rare cases
- **Effluent Monitoring Requirements**
  - Monthly, Quarterly, or Annual
  - Based on sources and potential effluent quality
- **WWTPs w/ IPPs:**
  - Establish Local Limit(s)
  - Source Reduction/Control, Compliance and Enforcement under IPP
- **WWTPs w/o IPPs:**
  - Minimization Plans if needed

*WWTPs with IPPs and Municipal EPA Majors

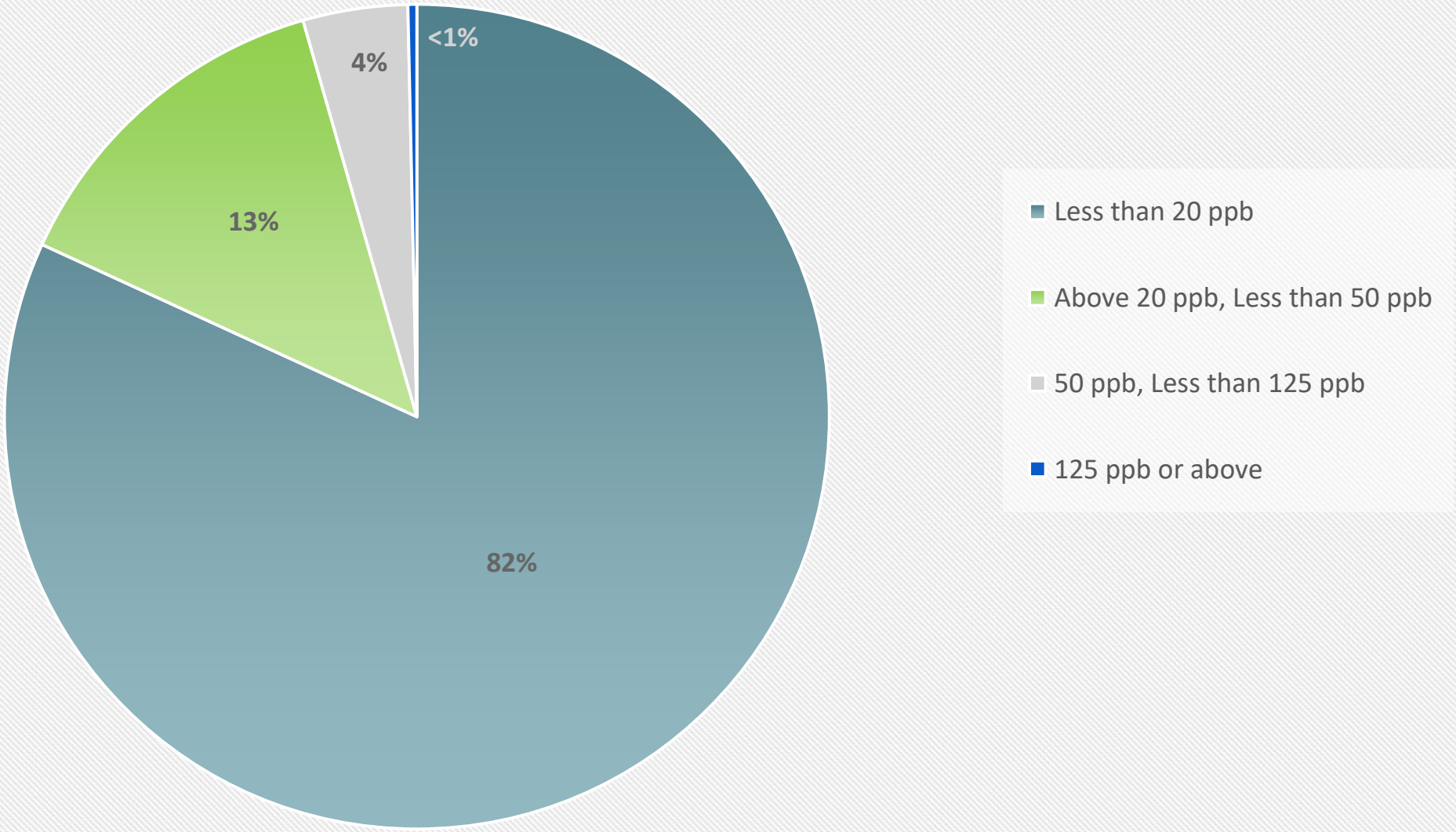
Land Application of Biosolids Containing PFAS Interim Strategy

- Effective Date: July 1, 2021
- Refers to residuals from wastewater treatment plants (WWTPs) which undergo additional treatment to be land applied as biosolids
- Sampling frequency determined by size of the WWTP and whether the WWTP has an Industrial Pretreatment Program (IPP)
  - All USEPA NPDES Majors/2218 GW/IPPs: One sample per calendar year
  - All USEPA NPDES Minors/Non-IPPs/All other GW Permittees: One sample each permit cycle (5 years)
- Communication to landowners/farmers required prior to land application
- All sample results must be submitted to EGLE via MiEnviro Portal, previously MiWaters

Analytical Results/Source Investigation and Reduction Efforts

- Based on the PFOS results, the WWTPs are placed in the following tiers:
  - Equal to or Below 20 ppb
  - Above 20 ppb – Less than 50 ppb
    - *Recommended* to sample effluent and identify sources
  - Above 50 ppb – Less than 125 ppb
    - *Required* to sample effluent, identify sources, and reduce land application rate*
  - Equal to or Above 125 ppb
    - Deemed Industrially Impacted and cannot be land applied
    - *Industrially Impacted* refers to biosolids at WWTPs with significant sources of PFAS, which is accumulating in the solids

2021 - 2022 Biosolids Interim Strategy PFOS Concentrations



Reductions in PFOS in Industrially Impacted Biosolids from WWTPs

Municipal WWTP	PFOS, Effluent (ppt, highest*)	PFOS, Effluent (ppt, most recent*)	PFOS Reduction in Effluent (highest to most recent)	2017/2018 Biosolids PFOS (ppb)	2021 Biosolids PFOS (ppb)	2022 Biosolids PFOS (ppb)	PFOS Reduction Since IPP Initiative
WWTP #50	540	4.76	99%	983	140	3.5	99.6%
WWTP #14	360	6.75	98%	1060	120	86.7	91.8%
WWTP #57	2000	6.7	99%	1680	33	30	98.2%
WWTP #54	240	5.4	97%	387	74/180	63	83.7%
WWTP #92	4800	12	99%	2150	113	NA	94.7%

EGLE refers to biosolids as being industrially-impacted when the PFOS concentration is greater than 125 parts per billion

*Data received by November 1, 2022

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Reductions in PFOS in Biosolids from WWTPs

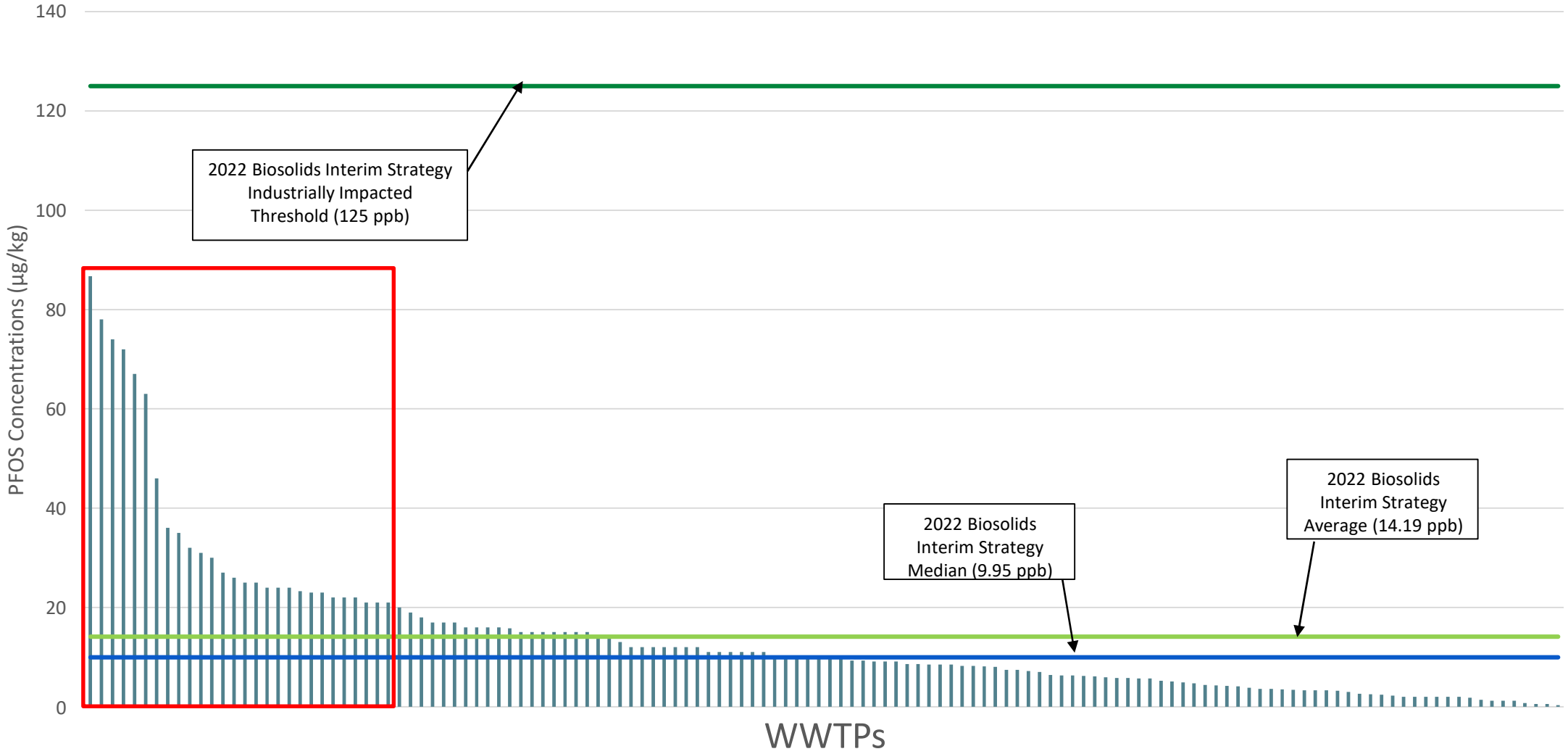
Municipal WWTP	PFOS, Effluent (ppt, highest*)	PFOS, Effluent (ppt, most recent*)	PFOS Reduction in Effluent (highest to most recent)	2017/2018 Biosolids PFOS (ppb)	2021 Biosolids PFOS (ppb)	2022 Biosolids PFOS (ppb)	PFOS Reduction Since IPP Initiative
WWTP #40	351	15	96%	21.8	NA	NA	NA
WWTP #74	1150	15	99%	77.6	36	9.1	88.3%
WWTP #53	40	6.57	84%	6.49	NA	NA	NA
WWTP #38	37	5.69	85%	9.4	4.9	12	-27.6%
WWTP #49	130	5.7	96%	21	20	NS	4.8%

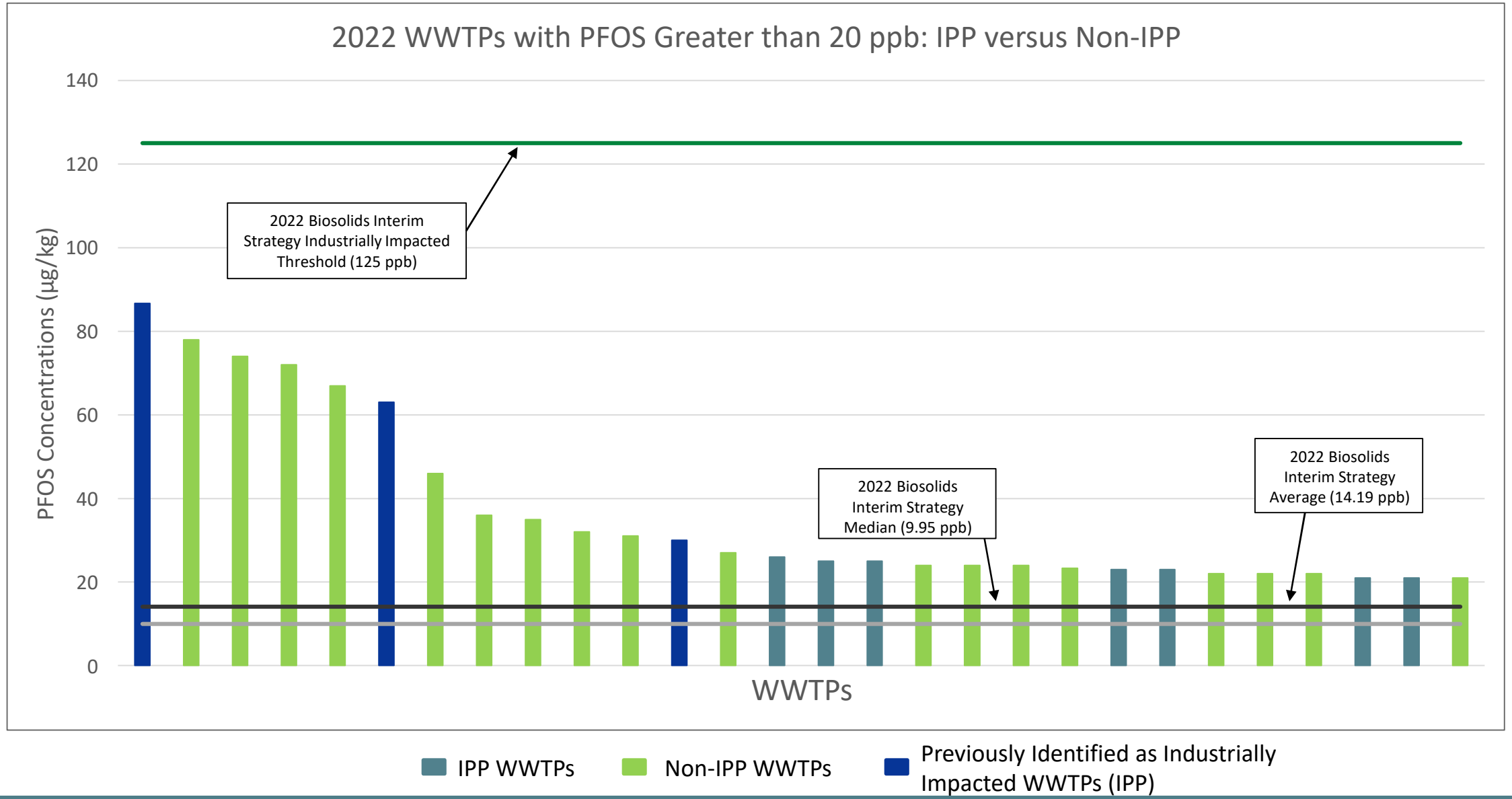
*Data received by November 1, 2022

WWTP IPP STATUS	Total Type of WWTP in 2021	20 ppb or below	Above 20 ppb, below 50 ppb	Above 50 ppb, below 150 ppb	150 ppb and above	Total Type of WWTP in 2022	20 ppb or below	Above 20 ppb, below 50 ppb	Above 50 ppb, below 125 ppb	125 ppb and above
Non-IPP	99	82	13	4	0	73	55	14	4	0
IPP	63	54	6	2	1	61	51	8	2	0
Total WWTPs	162	136	19	6	1	134	106	22	6	0

IPP WWTP: Wastewater treatment plant accepts industrial (non-domestic) wastewater
Non-IPP WWTP: Wastewater treatment plant is not authorized to accept industrial (non-domestic) wastewater

2022 Biosolids PFAS Interim Strategy WWTP PFOS Concentrations




2022 WWTPs with PFOS Greater than 20 ppb: IPP versus Non-IPP
140
120
100
80
60
40
20
0
PFOS Concentrations (µg/kg)
2022 Biosolids Interim Strategy Industrially Impacted Threshold (125 ppb)
2022 Biosolids Interim Strategy Median (9.95 ppb)
2022 Biosolids Interim Strategy Average (14.19 ppb)
WWTPs
IPP WWTPs
Non-IPP WWTPs
Previously Identified as Industrially Impacted WWTPs (IPP)

Source Identification and Ongoing Sampling

- Collection System Sampling
  - Review areas of the community that may or may not show detections of PFAS
- WWTP Site Visits
  - EGLE provides assistance as needed on non-domestic user visits
- Biosolids Storage Clean Outs
  - Ensures possible historic accumulation is removed
- Review of Users
  - WWTPS review all users to the system to further investigate or eliminate potential sources
- Review of nearby PFAS sites
  - MPART sites: AFFF

EGLE Biosolids PFAS Webpage

www.mi.gov/biosolids

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Michigan Biosolids PFAS-related information and links

Home > About Us > Divisions and Offices > Water Resources > Biosolids > PFAS-related information

In early 2018, EGLE's Water Resources Division (WRD) developed the Industrial Pretreatment Program (IPP) PFAS Initiative Study of 95 municipal Wastewater Treatment Plants (WWTPs) to help identify and systematically reduce and eliminate sources of PFAS (PFOS/PFOA) entering wastewater collection systems. During this study, some WWTPs were found to have elevated PFAS in their effluent and associated residuals (sludge/biosolids). Through this study, WRD identified 6 WWTPs with industrially impacted biosolids. WRD temporarily restricted their land application program until elevated sources of the PFOS were eliminated and residual PFOS concentrations were decreased.

Expanding upon the information collected during the IPP PFAS Initiative, in the fall of 2018, WRD launched a study to evaluate the presence of PFAS in Municipal Wastewater and Associated Residuals. Through this study, 42 municipal WWTPs were sampled to evaluate the presence of PFAS in influent, effluent, and residuals. As part of this initiative, 29 land application sites (associated with 10 municipal WWTPs) were evaluated to further understand the potential impact land-applied biosolids has on the environment. AECOM Technical Services, Inc. (a consulting firm) was contracted by WRD to perform all the sampling in this study. All samples were analyzed for 24 PFAS compounds.

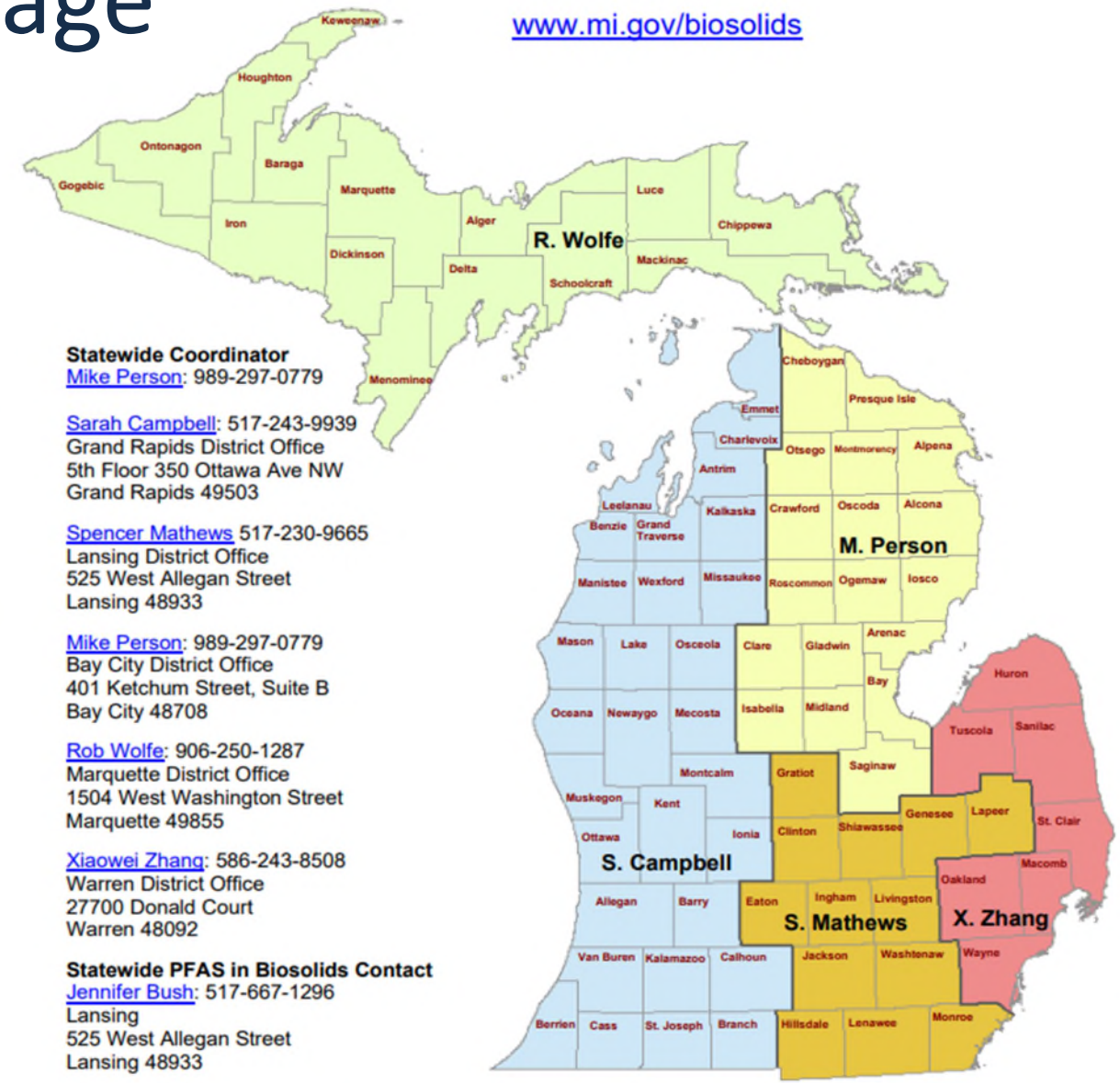
For a summary of the study and initial findings of the IPP PFAS Initiative, see the Summary Report: PFAS in Municipal Wastewater and Associated Residuals (Sludge/Biosolids). For the complete detailed report covering the IPP PFAS Initiative and the Statewide Study of 42 municipal WWTPs, see Evaluation of PFAS in Influent, Effluent, and Residuals of Wastewater Treatment Plants (WWTPs) in Michigan.

For a summary of the land application site screening results, see Statewide Wastewater Treatment Plant and Biosolids PFAS Study: Field Reports Summary. See the below attachments for detailed field reports covering the screening results for individual land application sites. Persons with disabilities may request this material in an alternative format by contacting EGLE's ADA Accessibility Coordinator. Please visit Michigan.gov/ADA for a list of state Coordinators.

- Attachment A – Delhi Twp. WWTP Field Report
- Attachment B – Gaylord, Jackson, Midland, and SHVUA WWTPs Field Report
- Attachment C – Port Huron WWTP (Fort Gratiot) Field Report
- Attachment D – Bronson WWTP Field Report
- Attachment E – Ionia WWTP Field Report
- Attachment F – Wixom WWTP Field Report
- Attachment G – Lapeer WWTP Field Report

Field Report Addendums

- Delhi Twp. WWTP Field Report Addendum
- Bronson WWTP Field Report Addendum



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EGLE MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

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3/30/2022

Additional Information

- **IPP PFAS Initiative:** IPP PFAS Initiative Webpage
- **Source Doc**: Industrial Sources of PFOS to Municipal Wastewater Treatment Plants as identified through the Michigan Department of Environment, Great Lakes, and Energy Industrial Pretreatment program Per-and Polyfluoroalkyl Substances Initiative
- **WWTP Permit Strategy:** Municipal NPDES Permitting Strategy for PFOS and PFOA
- **EGLE Biosolids PFAS webpage**
- **Summary Report**: Initiatives to Evaluate the Presence of PFAS in Municipal Wastewater and Associated Residuals (Sludge/Biosolids) in Michigan
- **Detailed Report**: Evaluation of PFAS in Influent, Effluent, and Residuals of Wastewater Treatment Plants (WWTPs) in Michigan
- **Biosolids Interim Strategy:** LAND APPLICATION OF BIOSOLIDS CONTAINING PFAS Interim Strategy Updated 2022 (michigan.gov)
- **MPART:** https://www.michigan.gov/pfasresponse/