

# PFAS: The Michigan Experience

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Phil Argiroff

Water Resources Division Assistant Director

[argiroffp@michigan.gov](mailto:argiroffp@michigan.gov)

517-290-3039

# Water Resources Division

## Protect and Monitor

- 💧 4 Great Lakes and Lake St. Clair
- 💧 11,000 inland lakes
- 💧 76,000 river and stream miles
- 💧 6.5 million acres of wetlands
- 💧 74,000 acres of coastal dunes
- 💧 Groundwater

For swimming, fishing, drinking water, and aquatic ecosystems.



# WRD PFAS Work

- Surface Water
  - Ambient water sampling
  - Fish collection
- Wastewater
  - Industrial Pretreatment Program
  - Direct discharges
  - Permit Strategy
  - Biosolids



# DEQ Water Quality Criteria for PFAS

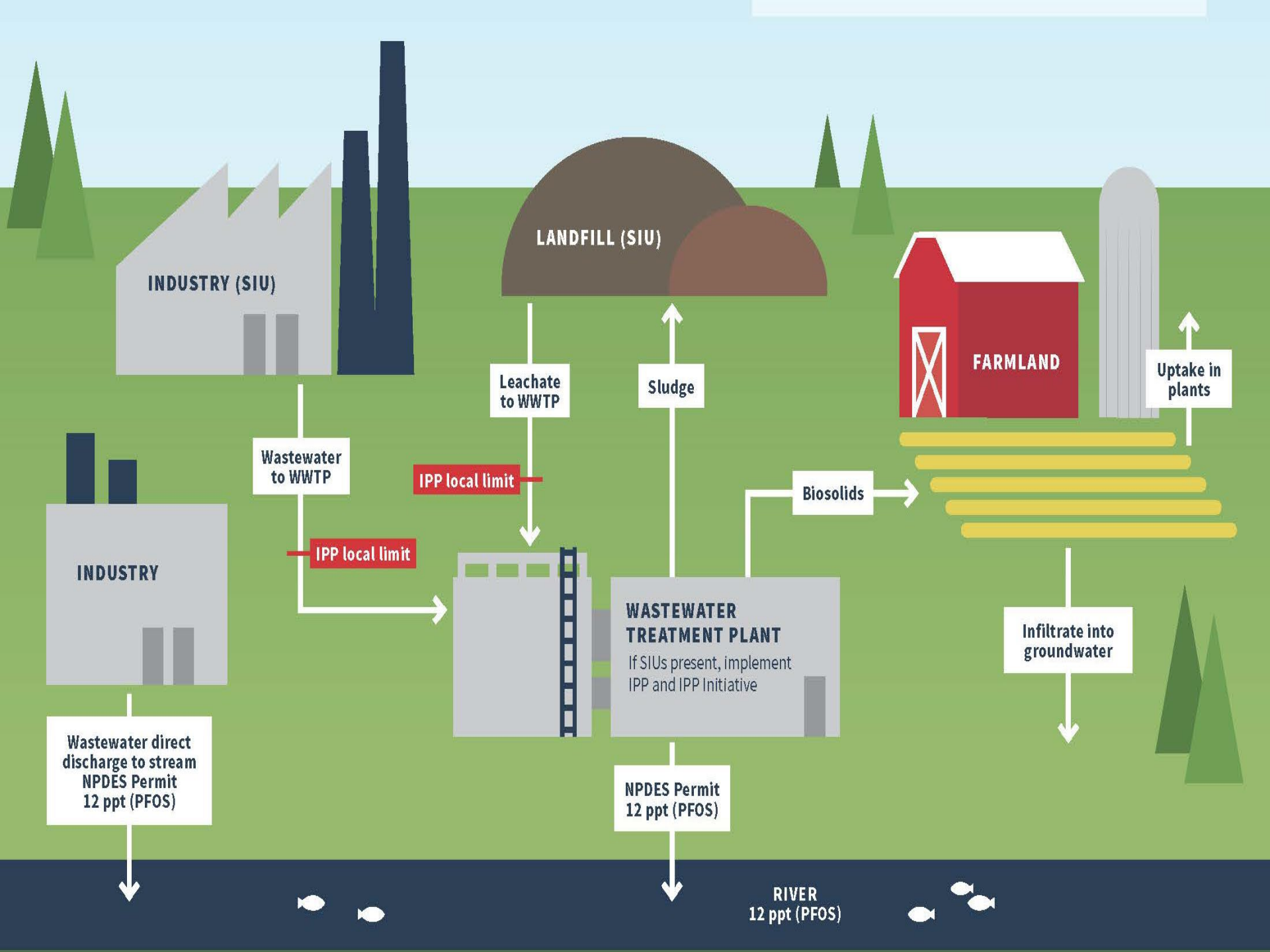
- Michigan developed Rule 57 Human Noncancer Values (HNV) for both PFOS and PFOA in surface waters

	HNV (nondrinking)	HNV (drinking)	FCV	FAV	AMV
PFOS (ng/L)	12	11	140,000	1,600,000	780,000
PFOA (ng/L)	12,000	420	880,000	15,000,000	7,700,000

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





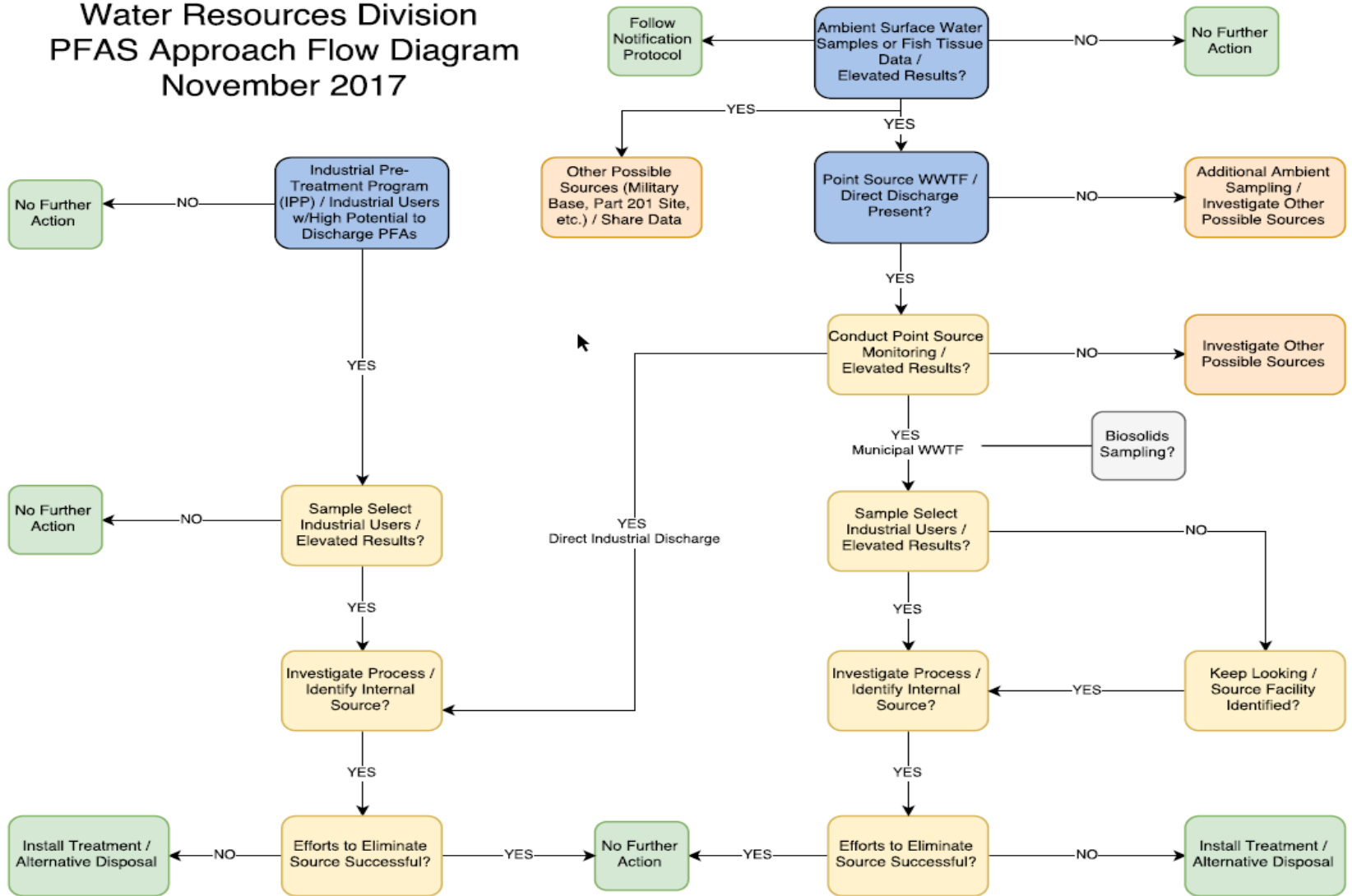
# IPP PFAS Initiative

- February 2018 – 95 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>

# Water Resources Division PFAS Approach Flow Diagram November 2017



# 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**

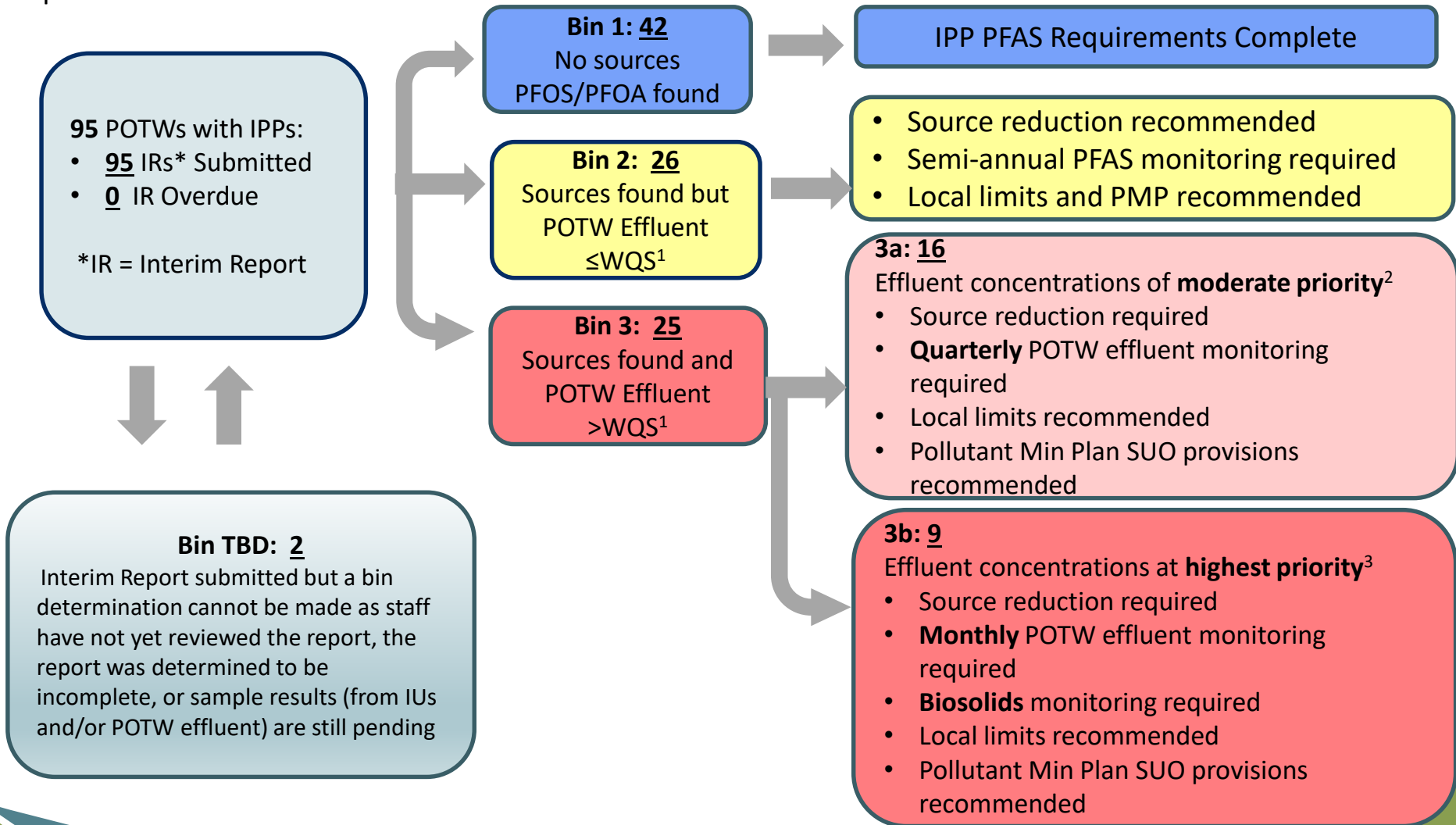


# IPP PFAS Initiative

- At the start (June 2018):
  - 70 WWTPs (72%) were meeting WQS and/or had no significant PFOS sources
- Currently (July 2019):
  - 79 WWTP (83%) are meeting WQA and/or are have no significant PFOS
- Low concentrations of PFOS (Range ~3-5 ppt) were detected even when no significant industrial sources were present.
  - Suggests anthropogenic “background” levels of PFAS may be found in most communities.

# IPP PFAS Initiative Status

Update 7-31-2019



# NPDES Permitting Strategy for PFOS and PFOA

- Industrial direct dischargers will use an Administrative Consent Order (ACO)
- Program components for Municipal Permits include:
  - Additional monitoring requirements
  - Effluent monitoring
  - Analytical methods and quantification levels
  - Updated Michigan and Federal Industrial Pretreatment Program language for approved programs
  - Monitoring frequency reduction language for PFOA and PFOS
  - Pollutant monitoring and source evaluation and reduction program for PFOA and PFOS; and reporting requirement

# Categorization of Municipal Facilities

Bins	Sources Present	PFOS Effluent Data > WQS	PFOS Effluent Data (ng/L)
3b	Yes	Yes	>50
3a	Yes	Yes	13-50
2	Yes	No	<12 ng/L
1	No	No*	<12 ng/L*

**National  
Pollutant  
Discharge  
Elimination  
System (NPDES)  
Permits  
& PFAS**

**For IPP WWTPs:**

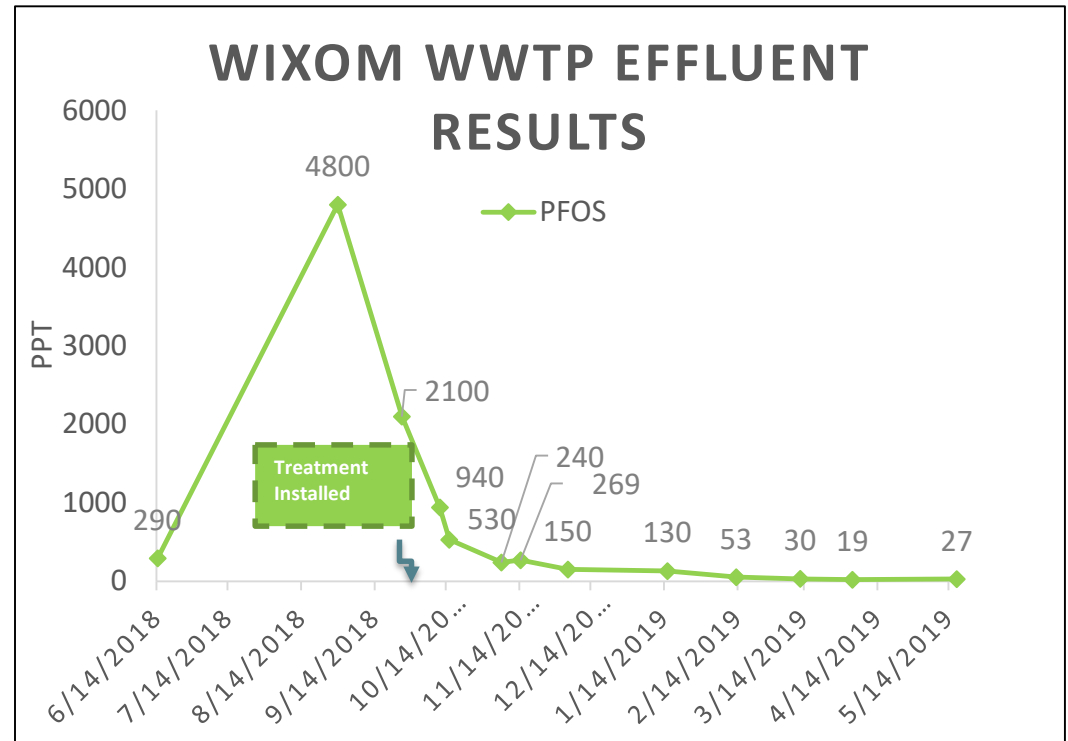
- PFOS/PFOA monitoring
  - Bin 1: 4x/5 yrs (w/additional monitoring requirements)
  - Bin 2: 2x/yr
  - Bin 3a: 4x/yr
  - Bin 3b: 12x/yr
- PMPs for PFOS/PFOA
  - Bin 3: all
  - Bin 2: upon trigger
  - Reporting may overlap w/IPP requirements



# Industrial Pretreatment Program (IPP) PFAS Initiative

## Wixom Wastewater Treatment Plant (WWTP)

- Federal/State Regulatory Program
- Prevent pollutant pass thru and accumulation in solids
- Strategy – reduce at source (Tribar, Plant 4)
- Treatment installed October 2018
- Discharge to Wixom from Tribar: <12 ppt PFOS since treatment
- PFOS concentrations in WWTP effluent discharged to Norton Creek continues to decrease



6 other WWTPs with IPPs in the watershed. PFAS present but at much lower concentrations

- Brighton WWTP: 16 ppt PFOS
- Lyon Twp., Dexter, Ann Arbor, YCUA (emerg. outfall only): 5 ppt or less.

Additional information on IPP PFAS Initiative:

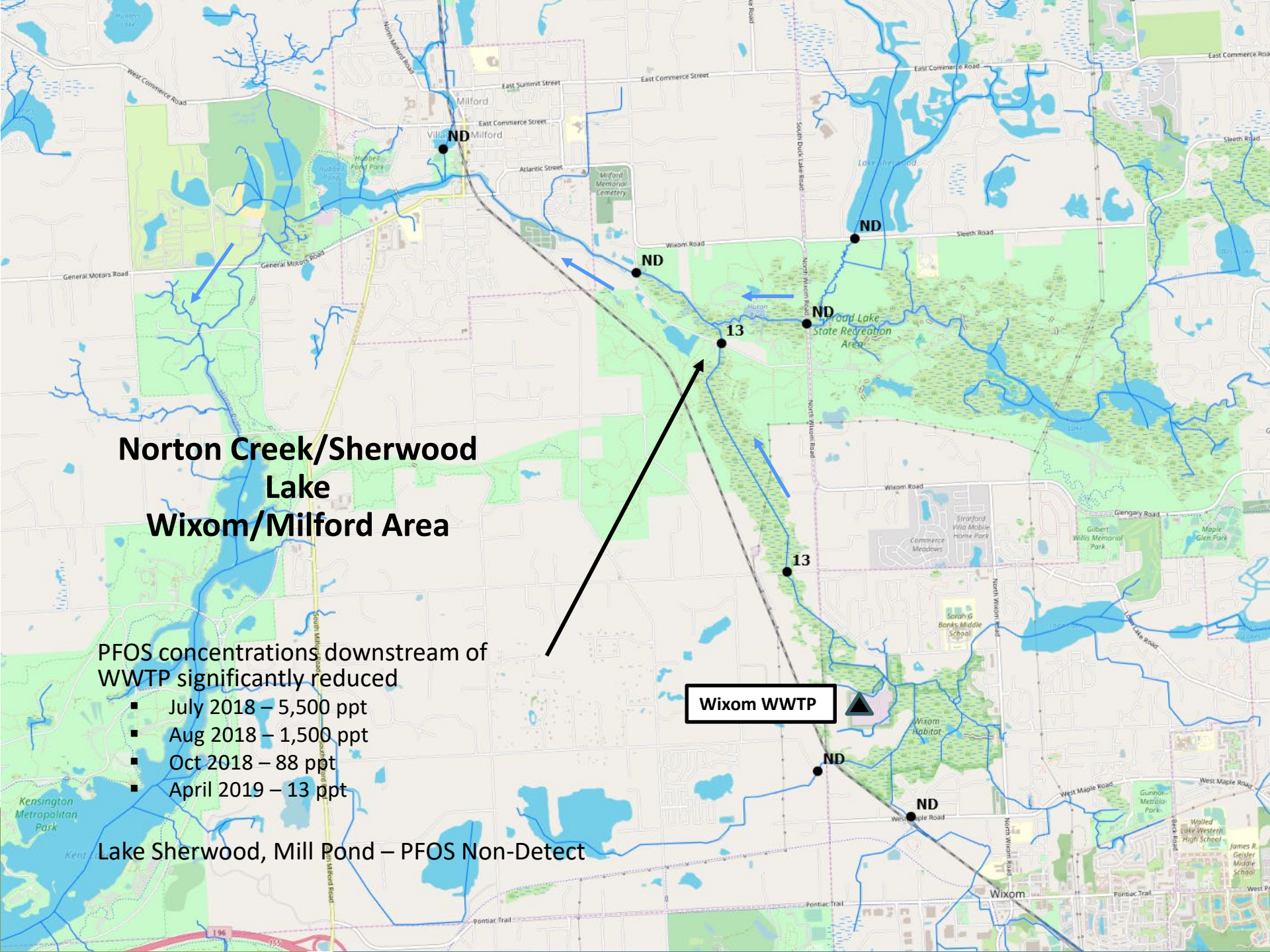
[https://www.michigan.gov/pfasresponse/0,9038,7-365-86510\\_88079-476131--,00.html](https://www.michigan.gov/pfasresponse/0,9038,7-365-86510_88079-476131--,00.html)

# Norton Creek/Sherwood Lake Wixom/Milford Area

PFOS concentrations downstream of WWTP significantly reduced

- July 2018 – 5,500 ppt
- Aug 2018 – 1,500 ppt
- Oct 2018 – 88 ppt
- April 2019 – 13 ppt

Lake Sherwood, Mill Pond – PFOS Non-Detect



# Statewide Biosolids Study

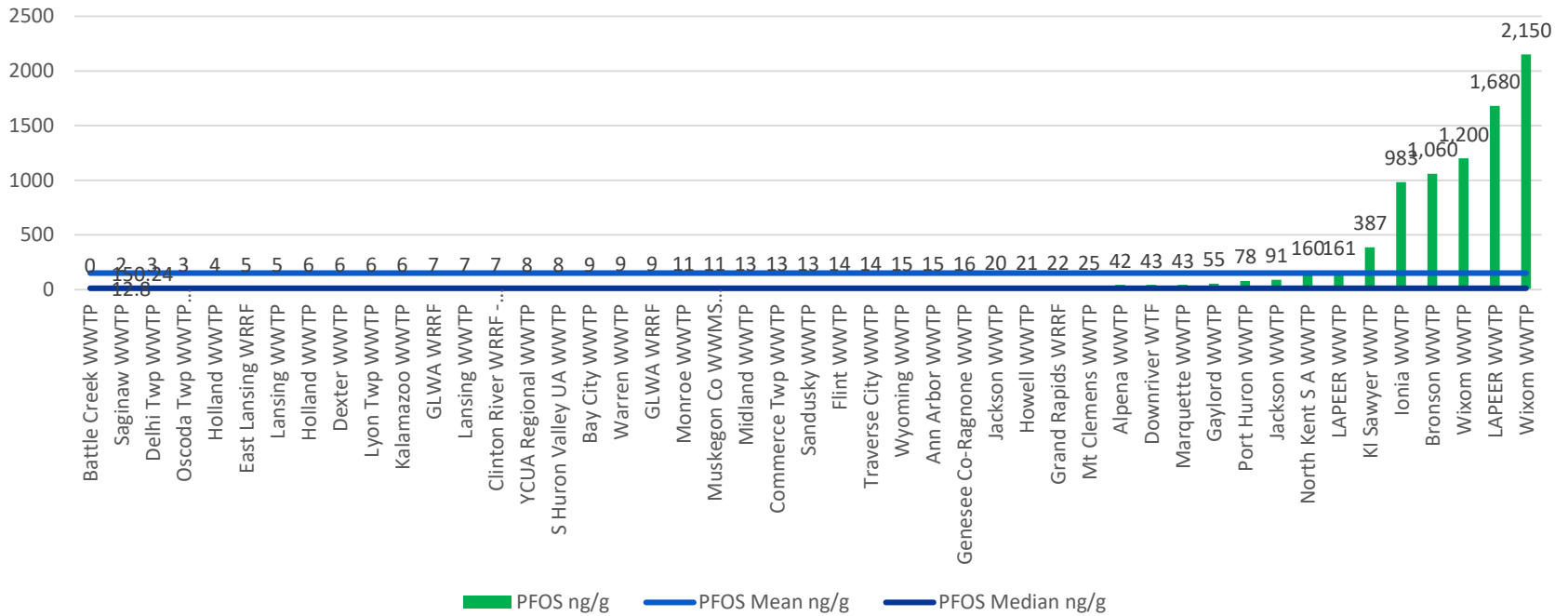
- Sample Effluent, Influent, & Biosolids from 41 WWTPs (Oct – Nov 2018)
  - 20 Largest
  - Various Medium and Small WWTPs
    - (3.0 – 9.0 MGD ( 8 WWTPs), 0.5 – 3.0 MGD ( 8 WWTPs), 0.2 – 0.4 MGD ( 5 WWTPs)
  - Various treatment processes
  - Some w/ no industrial users (and no IPPs)
- Screen select fields from WWTPs with high conc. of PFOS in biosolids (Spring 2019)

Follow-up based on results

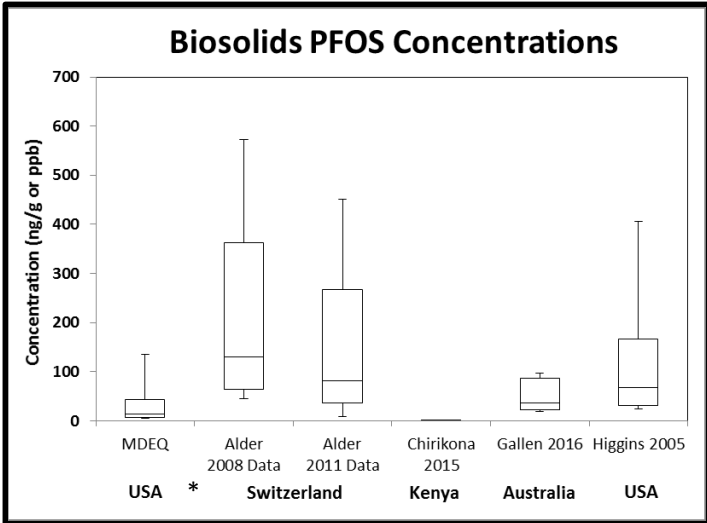
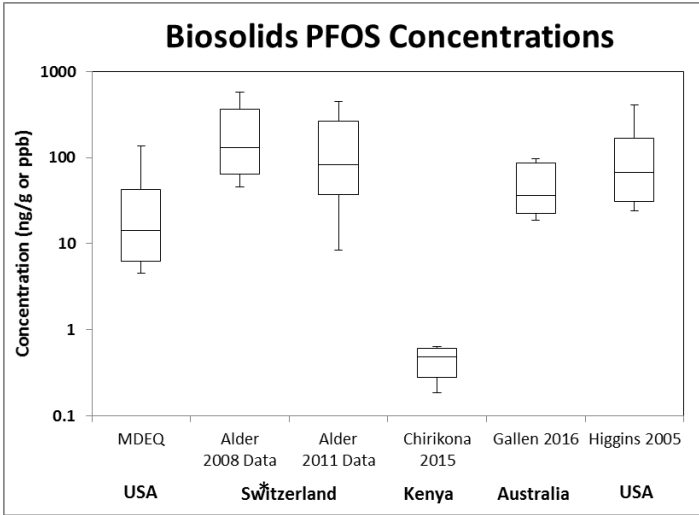
- Sample fields from WWTPs with “typical/low” PFOS concentrations in biosolids
- Identify data gaps
- In lieu of criteria, develop guidance to assist with biosolids management decisions



## WWTP Biosolids/Sludge PFAS Results PFOS (ng/g)



# Range of PFOS Concentrations



\*MDEQ concentrations from 2018 statewide study and excludes industrially impacted solids that are no longer being land applied.

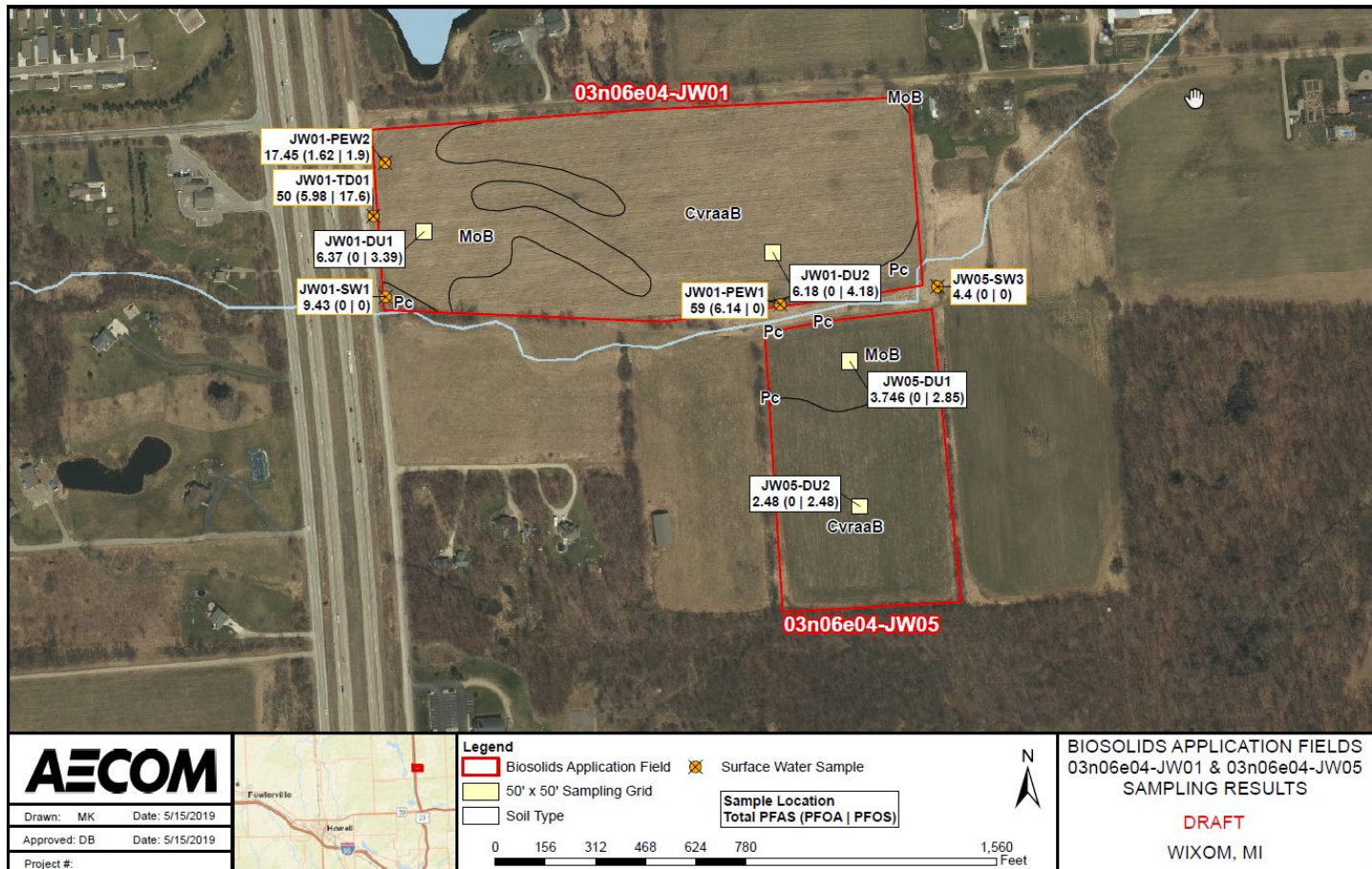


# Land Application Site Screening

- 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



# Wixom WWTP (pre Tribar Plant 4) 03N06E04-JW01 and 03N06E04-JW05



Effluent (ppt): PFOS 269; Total 4681

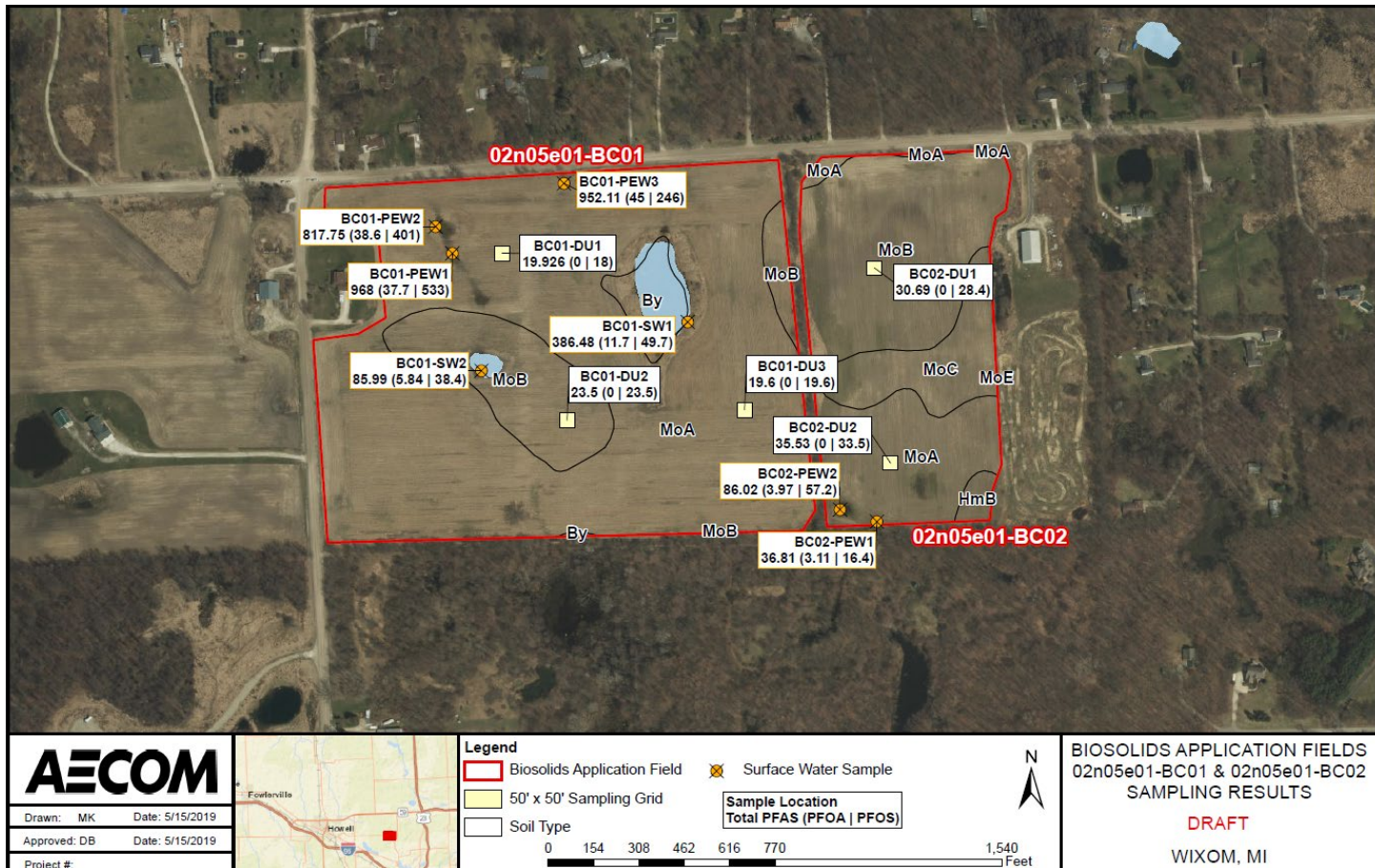
Biosolids (ppb): PFOS 2150 ; Total 2322

JW01: 243 dT 1995-2000 (4 applications)

JW05: 188 dT 1995-2001 (4 applications)

# Wixom WWTP

## 02N05E01-BC01 and 02N05E01-BC02



Effluent (ppt): PFOS 269; Total 4681  
 Biosolids (ppb): PFOS 2150 ; Total 2322

BC01: 521 dT 2010-2015 (5 applications)  
 BC02: 184 dT 2010-2015 (5 applications)

# Next Steps

- Monitoring Well Installation
- Additional Field Data
- Statewide Soil Study
- Biosolids Guidance Strategy

# PFAS Resources

- **Michigan PFAS Action Response Team (MPART)**
- <https://www.michigan.gov/pfasresponse>
  
- Michigan PFAS Sampling Guidance
- [https://www.michigan.gov/pfasresponse/0,9038,7-365-86510\\_87154-469832--,00.html](https://www.michigan.gov/pfasresponse/0,9038,7-365-86510_87154-469832--,00.html)
- - Suggested PFAS Laboratory Analytes
  - General PFAS Sampling Guidance
  - Wastewater PFAS Sampling Guidance
  - Surface Water PFAS Sampling Guidance
  - Fish Tissue PFAS Sampling Guidance
  
- **WRD Industrial Pretreatment Program PFAS Initiative**
- [https://www.michigan.gov/pfasresponse/0,9038,7-365-86510\\_88079-476131--,00.html](https://www.michigan.gov/pfasresponse/0,9038,7-365-86510_88079-476131--,00.html)
- - Recommended PFAS Screening & Evaluation Procedure for IPPs
  - PFAS Frequently Asked Questions for IPPs
  - EGLE IPP PFAS Staff Map
  - PFAS Source Evaluation Follow-Up Letter to IPP WWTPs
  - PFAS Source Evaluation and Reduction Requirements Letter to IPP WWTPs
  - IPP PFAS Initiative Regional Information Meetings
  - EGLE IPP PFAS Initiative webinar (4/11/18, 61 min)
  
- **Michigan Rule 57 Water Quality Values**
- [https://www.michigan.gov/egle/0,9429,7-135-3313\\_3681\\_3686\\_3728-11383--,00.html](https://www.michigan.gov/egle/0,9429,7-135-3313_3681_3686_3728-11383--,00.html)
- - WRD, Rule 57 Values for Perfluorinated Compounds (attached)
  
- **Biosolids**
- - PFAS and Biosolids Frequently Asked Questions
  - NEBRA information update: PFAS in Biosolids
  
- **PFAS Related Watershed Activities**
- [https://www.michigan.gov/pfasresponse/0,9038,7-365-86510\\_88060\\_88065---,00.html](https://www.michigan.gov/pfasresponse/0,9038,7-365-86510_88060_88065---,00.html)
- - Clinton River/Lake St. Clair
  - Flint River Watershed
  - Huron River Watershed
  - River Raisin Watershed Report

# Staff Contact

**Jon Russell (overall program)**

Field Operations Manager, Lakes Erie and Huron  
517-243-9951 – [russellj@michigan.gov](mailto:russellj@michigan.gov)

**Christine Alexander (all treatment/permit questions)**

Permits Section Manager  
517-243-4670 – [alexanderc2@michigan.gov](mailto:alexanderc2@michigan.gov)

**Stephanie Kammer (overall program/biosolids)**

Supervisor, Lansing District Office  
517-284-5522 – [kammers@michigan.gov](mailto:kammers@michigan.gov)

**Mike Person (biosolids)**

Biosolids Program Specialist  
989-297-0779 – [personm@michigan.gov](mailto:personm@michigan.gov)



Michigan Department of  
**Environment, Great Lakes, and Energy**

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