North 34th Street
MPART PFAS Town Hall

Abigail Hendershott, MPART Executive Director
Michigan PFAS Action Response Team
(616) 888-0528
HendershottA@Michigan.gov

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Introductions, Logistics and Agenda

- Introductions – Abigail Hendershott, MPART Executive Director
- Agenda:
  - MPART Overview – Fred Sellers, Michigan Department of Environment, Great Lakes, and Energy
  - Health – Lisa Fischer, Michigan Department of Health and Human Services
  - Investigation Area – Erica Bays, Michigan Department of Environment, Great Lakes, and Energy
  - Public Drinking Water – James Baker, Public Services Director & City Engineer, City of Kalamazoo
- Q&A

North 34th Street
MPART PFAS Town Hall

Fred Sellers, Regional Lead Kalamazoo
Michigan PFAS Action Response Team
(269) 569-1476
SellersF@Michigan.gov

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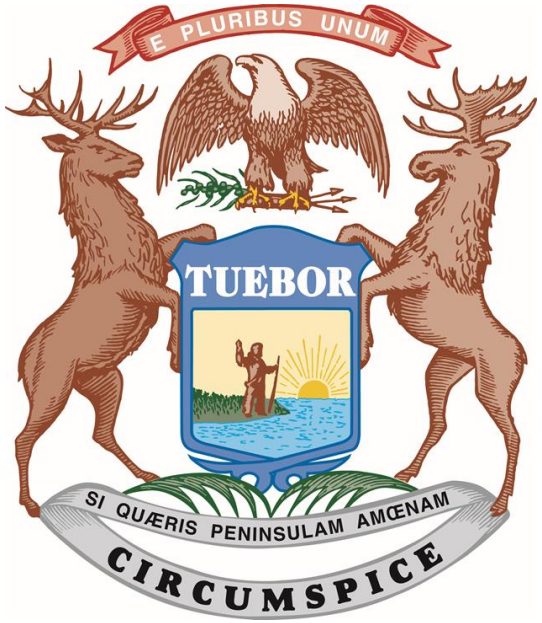
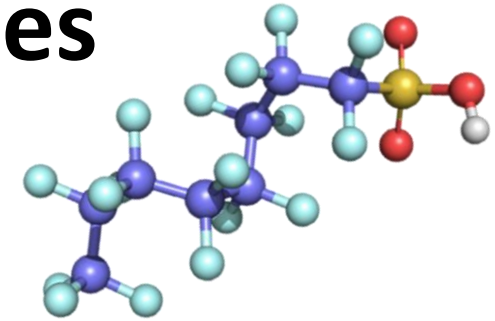
Michigan PFAS Action Response Team (MPART)



- Executive Order 2019-03
- Unique Multi-Agency Approach
- Leads Coordination and Cooperation Among All Levels of Government
- Directs Implementation of State's Action Strategy

Per- and Polyfluoroalkyl Substances (PFAS)



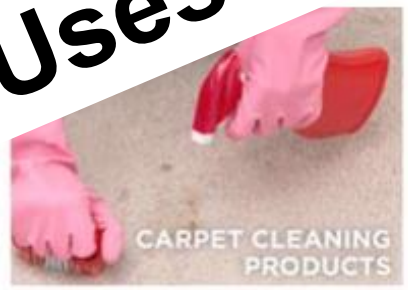
What are they?

- Strong Carbon-Fluorine Bonds
- Surfactants
- Highly Stable
- Repel Water, Oil, Fat, and Grease
- Began Developing in 1940s
- 5,000+ Compounds Today

Why the concern?

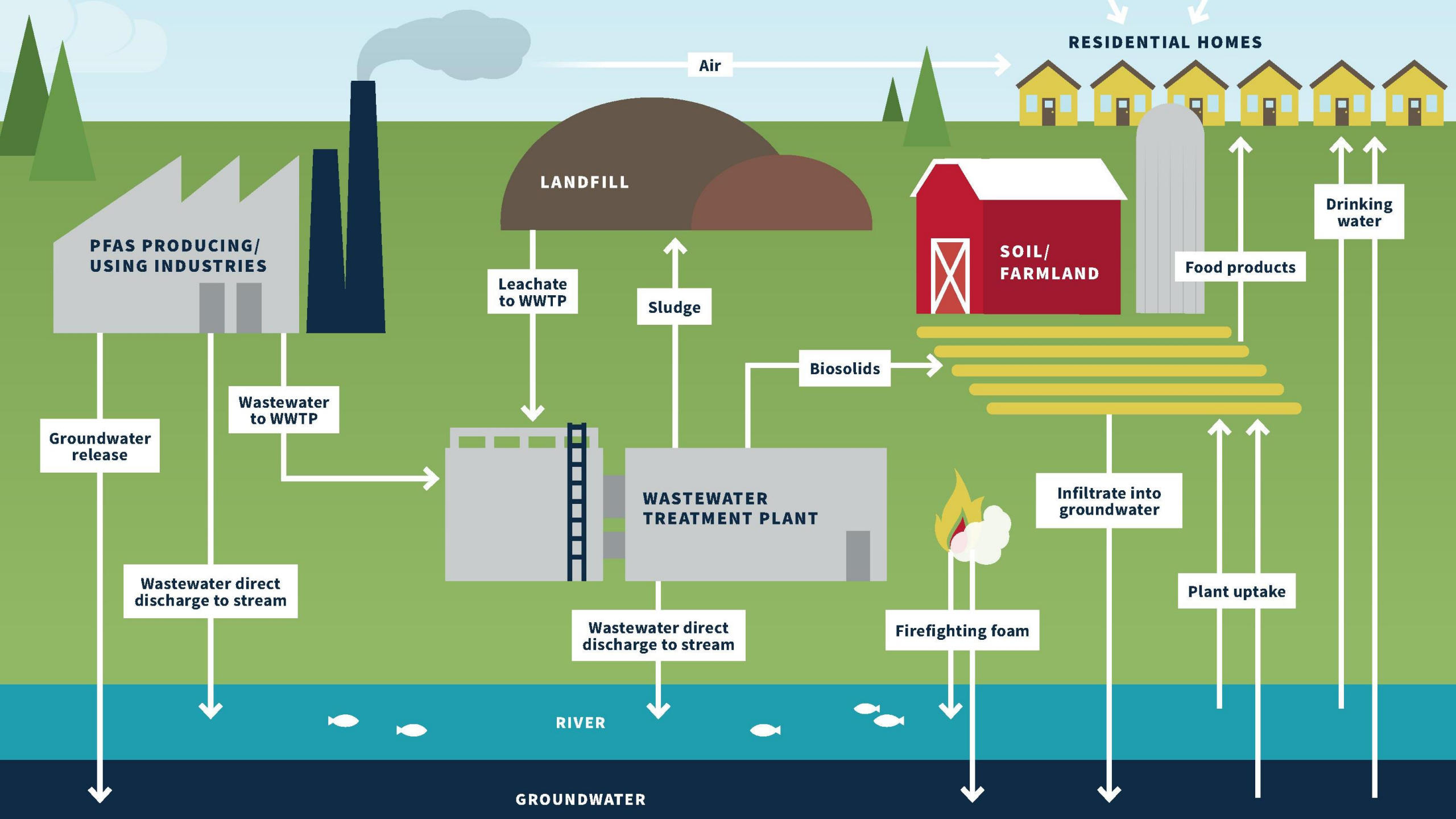
- Widespread through the ecosystem
- Don’t Break Down Easily - Hard to Get Rid of
- Bioaccumulate – Build Up in Our Bodies
- Some PFAS May Affect Health
- Some emerging science/information
- Lack of Federal Standards

PFAS Uses



https://www.sixclasses.org/videos/pfas

MPART


RESIDENTIAL HOMES
Air
LANDFILL
PFAS PRODUCING/
USING INDUSTRIES
SOIL/
FARMLAND
Drinking
water
Food products
Leachate
to WWTP
Sludge
Biosolids
Wastewater
to WWTP
Groundwater
release
WASTEWATER
TREATMENT PLANT
Infiltrate into
groundwater
Plant uptake
Wastewater direct
discharge to stream
Wastewater direct
discharge to stream
Firefighting foam
RIVER
GROUNDWATER

What is Michigan doing?

Protect Public Health

- Investigating where PFAS is in the environment
  - Drinking water, groundwater, water bodies
- Developed and enforcing, standards for PFAS in surface water, drinking water, and groundwater cleanup standards
  - Modifying standards as science evolves
- Educating the public to:
  - Prevent future contamination
  - Minimize future use of PFAS

Michigan PFAS Groundwater Clean-up and Drinking Water Standards

Compound	Standards
PFNA	6 ppt
PFOA	8 ppt
PFOS	16 ppt
PFHxS	51 ppt
GenX (HFPO-DA)	370 ppt
PFBS	420 ppt
PFHxA	400,000 ppt

Lakes and Streams Investigations

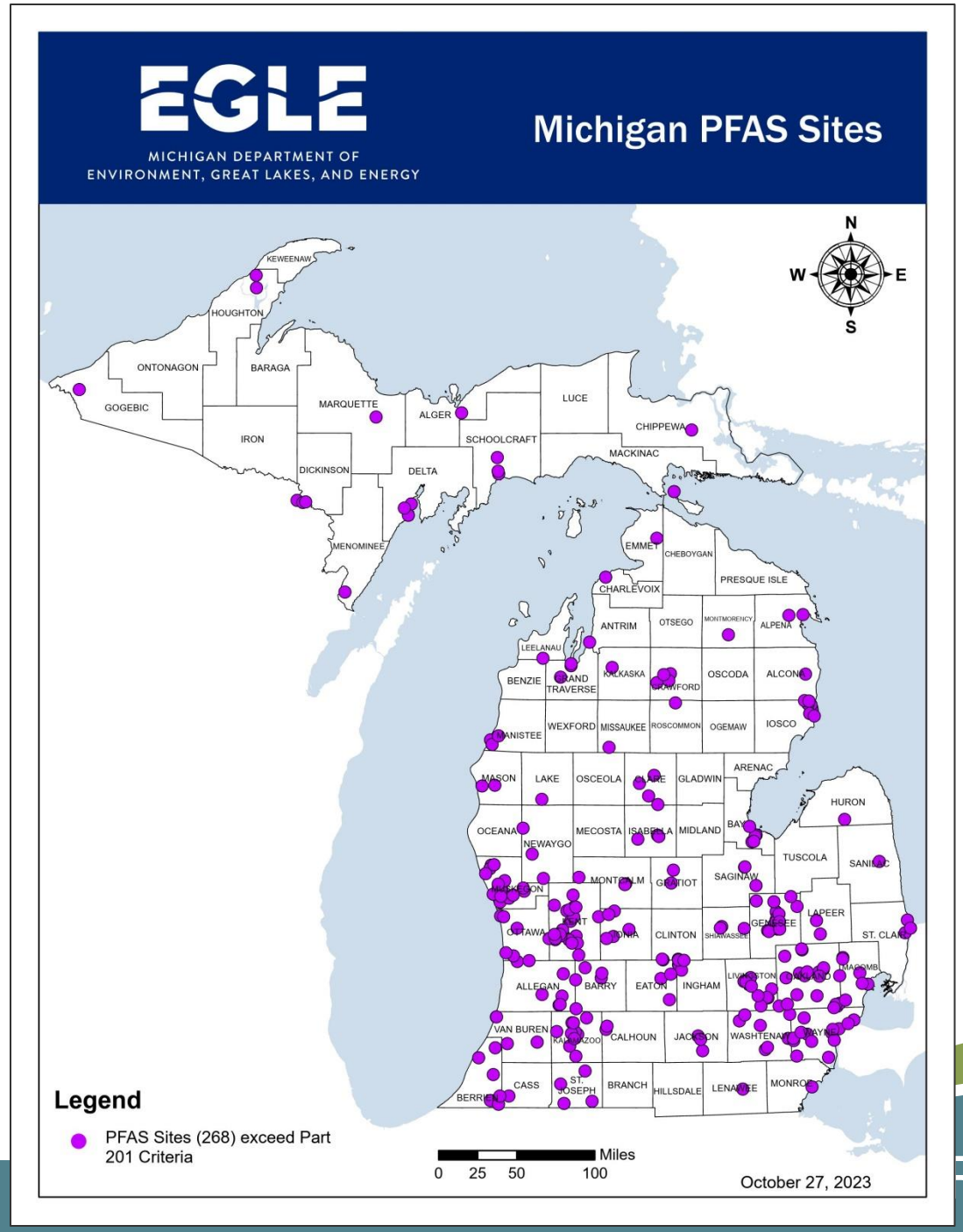
- Collecting water and fish samples

Fish Sampling

- 800-1000 fish filets sampled every year for PFAS around the state.

Michigan PFAS Sites

- Prioritized Investigations Based on Known or Suspected Sources, Potential for Exposure
- Protect Drinking Water Pathway
- List of PFAS Sites and Areas of Interest



Citizens Advisory Workgroup

Michigan.gov/MPARTCAWG

- Residents From Impacted Communities
- Key Charges:
  - Recommend How to Engage and Empower Communities
  - Recommend How to Educate the General Public
- Residents interested in becoming a CAWG Member:
  - Read the CAWG Charter
  - Submit a Membership Registration Form

PFAS and Health

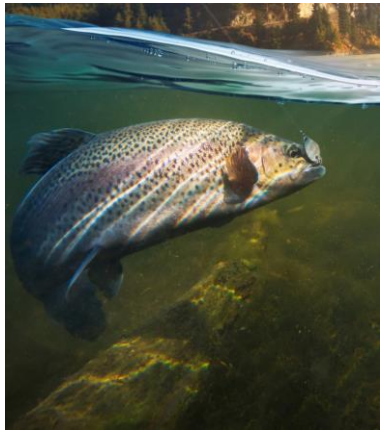
Lisa Fischer, Toxicologist
Michigan Department of Health and Human Services
517-331-2523
FischerL@Michigan.gov

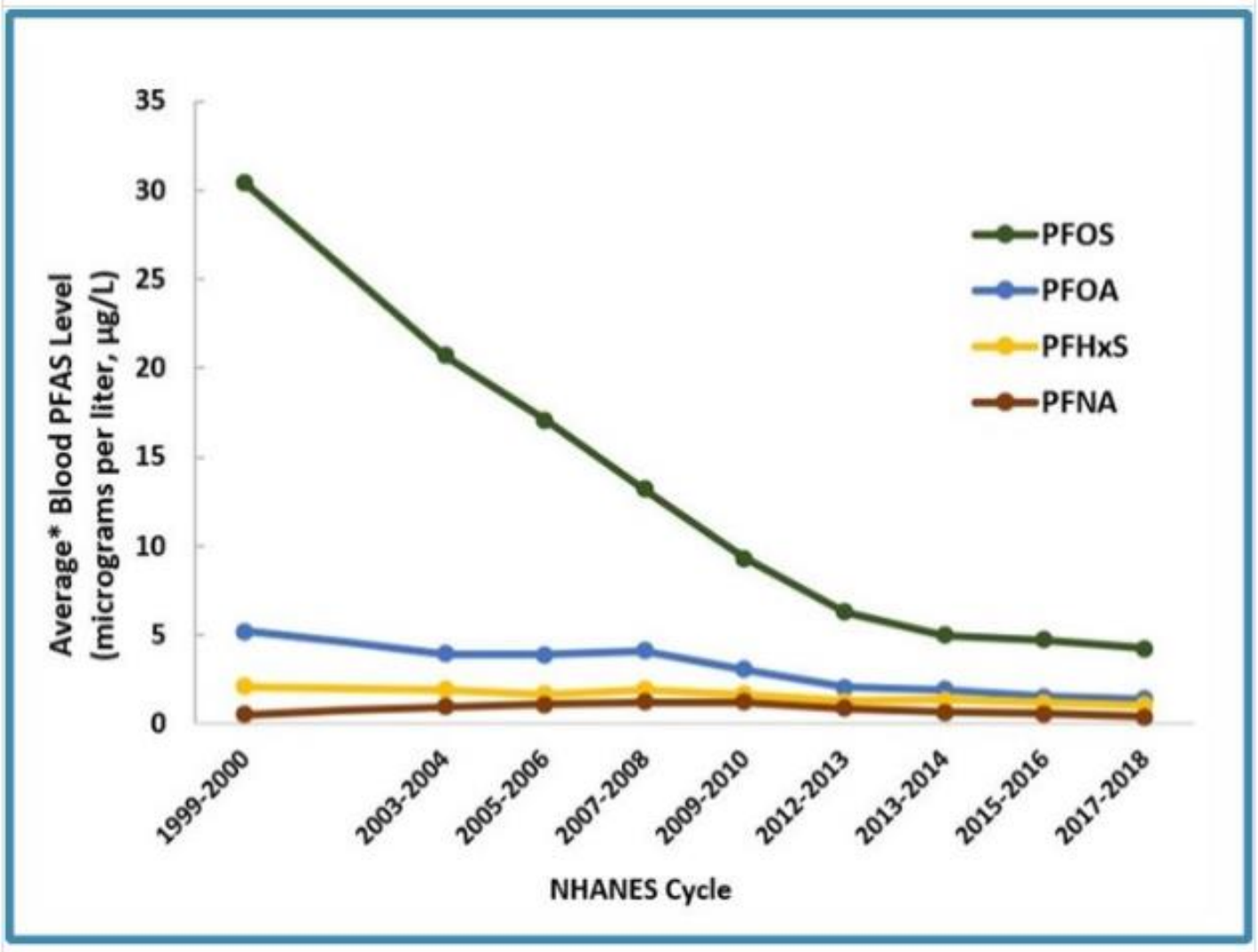
The Role of MDHHS/ Local Health Department (LHD)

- 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

Exposure to PFAS Chemicals

- Drinking contaminated water
- Eating fish caught from water contaminated by PFAS
  - "Eat Safe Fish" Guidelines
- Incidental swallowing of contaminated soil or dust
- Eating food packaged in materials containing PFAS
- Using some consumer products
- PFAS absorption through skin is typically not a concern





Blood levels of the most common PFAS in people in the United States 2000-2018

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

Associated Human Health Outcomes PFOA and/or PFOS

- Thyroid disease
- Liver damage
- Decreased immune system response to vaccines
- Developing certain types of cancer
  - In particular, kidney and testicular cancers*

* PFOA only

Multiple Lines of Consideration for Determining Public Health Response Actions

- MDHHS Comparison Values
- Residential Well Results (individually and collectively)
- Site–specific information (e.g., known source, geology, etc.)

MDHHS Comparison Values

- MDHHS Comparison Values are the lowest of:
  - MDHHS Public Health Drinking Water Screening Level
  - MPART Health-Based Value or Maximum Contaminant Level (MCL)

- Both the MDHHS screening levels and the MCL were set to protect everyone
  - including those most at risk of harm to their health: fetuses and breastfed babies

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MDHHS Comparison Values

PFAS	Comparison Values
PFOS	8 ppt [A]
PFOA	8 ppt [B]
PFNA	6 ppt [B]
PFHxS	51 ppt [B]
PFBS	420 ppt [B]
PFHxA	400,000 ppt [B]
GenX	370 ppt [B]

A. MDHHS Public Health Drinking Water Screening Level
B. MPART Health-Based Value or Maximum Contaminant Level (MCL)

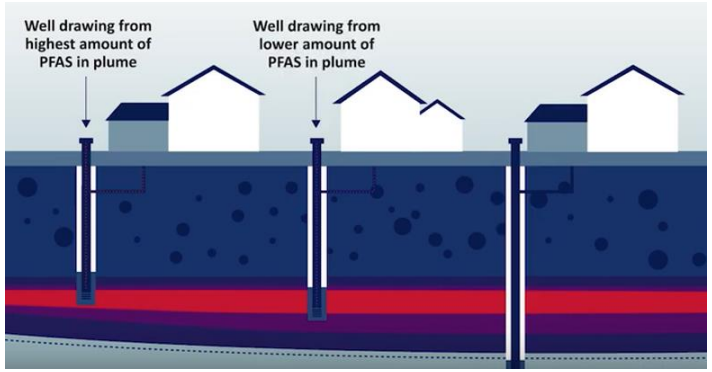
Residential Well Results (individually and collectively)

- No Detection
- Detected but less than the comparison value
- Exceedance

Site–Specific Information

Known Source

Geology



Plume

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MDHHS/LHD
Public Health Response Actions

- No public health actions necessary
- Recommend filter or use of alternate water
  - Need time to conduct investigation
  - Provides residents with protection from potential fluctuations in PFAS levels, if any, while investigation is ongoing
- Education
  - Provide information on PFAS in drinking water

Eating Fish from Michigan's Lakes & Rivers

Michigan.gov/eatsafefish

Eat Safe Fish Guidelines – Gull Lake

Fish Species	Chemicals Causing MI Serving Guideline	Fish Size	MI Servings/Month
Bluegill, Sunfish, Rock Bass	Mercury	Any	8
Largemouth Bass, Smallmouth Bass, Northern Pike	Mercury	Any	1
Smelt	PFOS	Any	2

MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

North 34th Street/Former Production Plated Plastics

Erica Bays

Remediation and Redevelopment Division (RRD)

269-350-0080|BaysE@Michigan.gov

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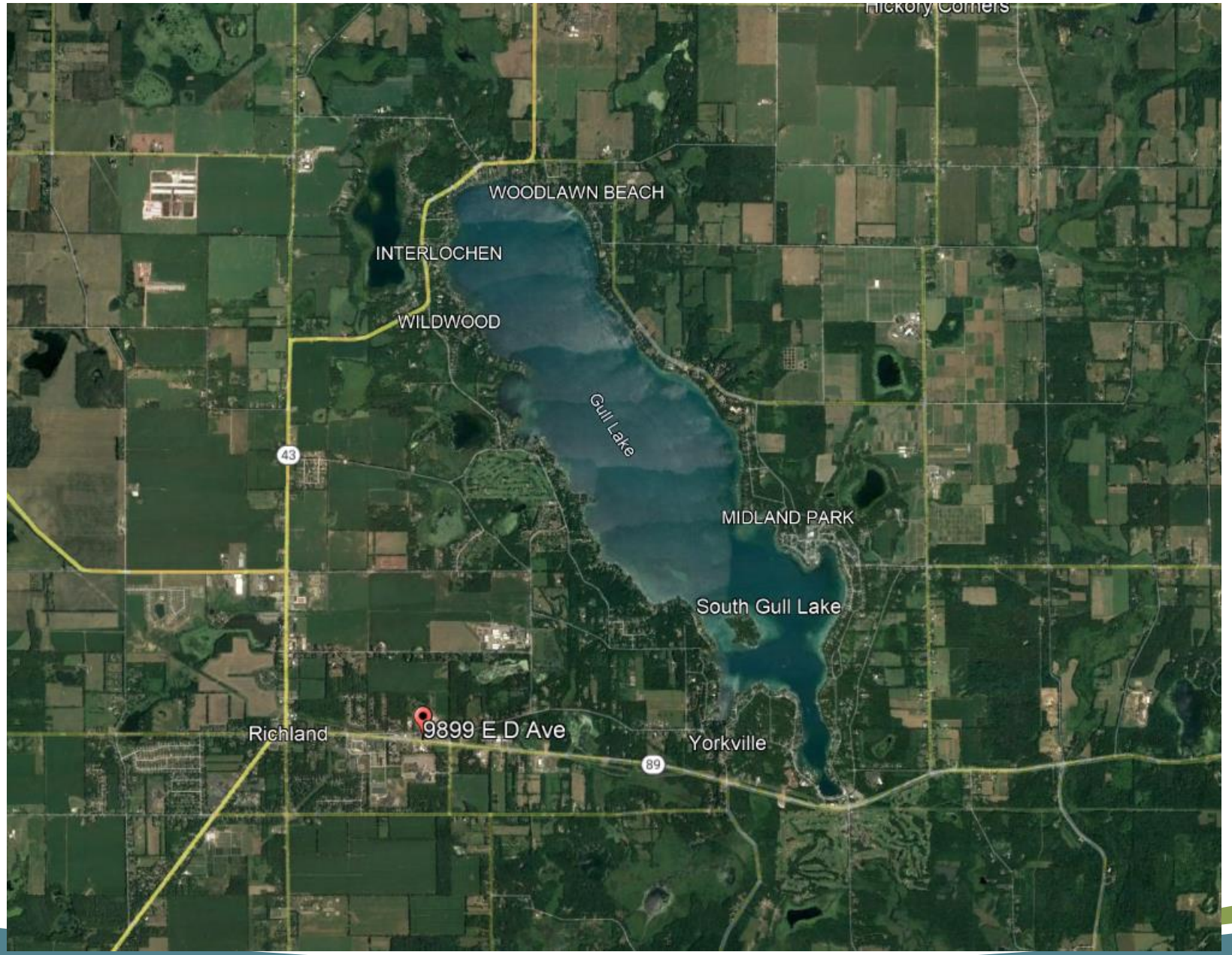
Hickory Corners
WOODLAWN BEACH
INTERLOCHEN
WILDWOOD
Gull Lake
43
MIDLAND PARK
South Gull Lake
9899 E D Ave
Richland
Yorkville
89

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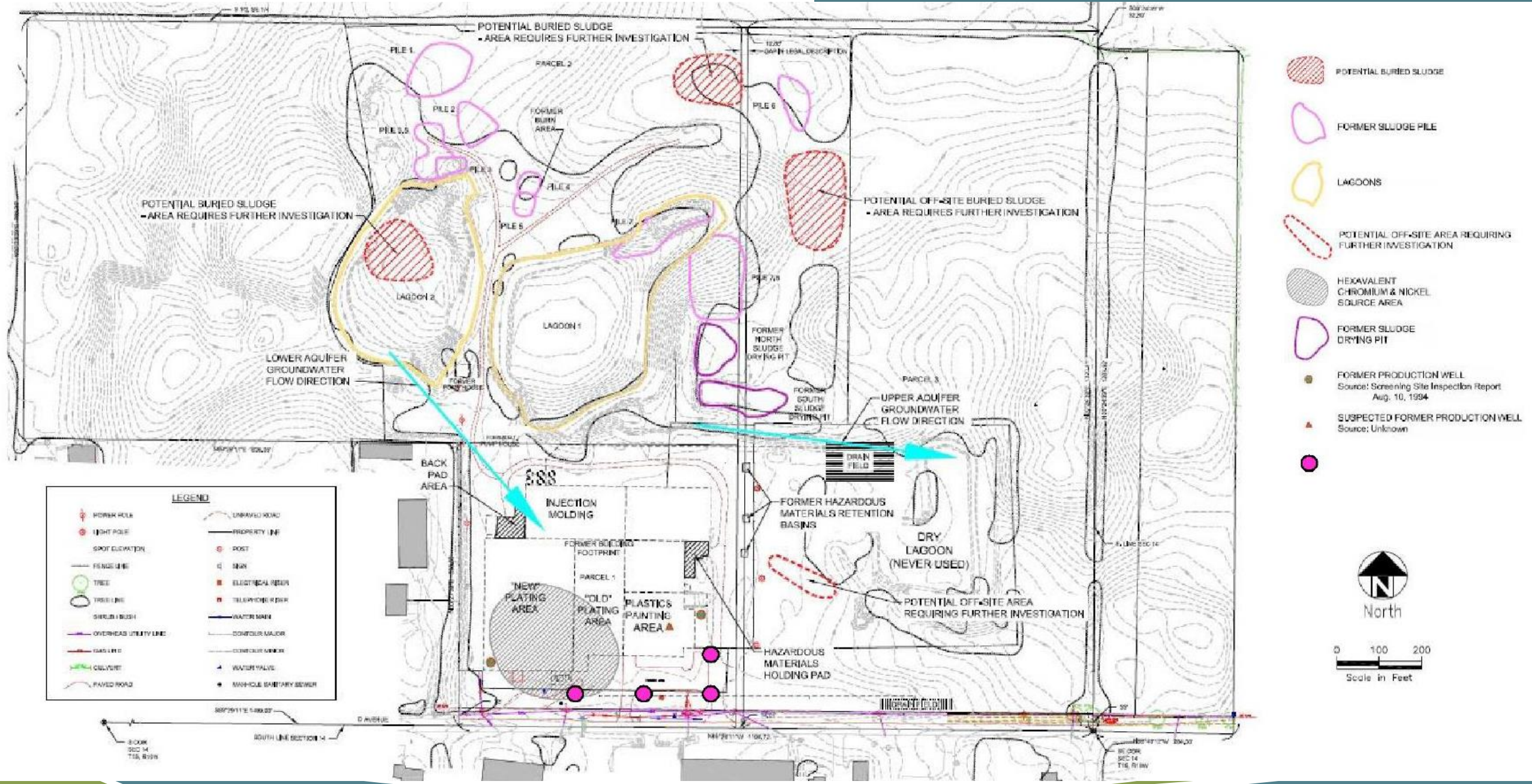
Outline

- Where have we been?
- Where we are now?
- Where are we going?

1978

Where have we been?

- Production Plated Plastics (PPP) - Former plastics plating company (~1966 – bankruptcy in 1991)
- 1977 – Heavy metal contamination discovered in residential wells
  - PPP replaced affected residential drinking water wells
- 1985 – Chlorinated Volatile Organic Compounds discovered at the site
  - PPP conducted investigations and operated a groundwater cleanup system
- 1988 – Municipal water extended to area impacted by nickel and chromium
- 1991 – PPP bankrupt, State took over response activities


POTENTIAL BURIED SLUDGE
- AREA REQUIRES FURTHER INVESTIGATION
PILE 1
PARCEL 2
PILE 2
PILE 3,5
FORMER BURN AREA
PILE 3
PILE 4
PILE 6
POTENTIAL BURIED SLUDGE
- AREA REQUIRES FURTHER INVESTIGATION
POTENTIAL OFF-SITE BURIED SLUDGE
- AREA REQUIRES FURTHER INVESTIGATION
PILE 5
PILE 7
PILE 7/8
LAGOON 2
LAGOON 1
FORMER NORTH SLUDGE DRYING PIT
LOWER AQUIFER GROUNDWATER FLOW DIRECTION
FORMER POWERHOUSE
FORMER SOUTH SLUDGE DRYING PIT
PARCEL 3
UPPER AQUIFER GROUNDWATER FLOW DIRECTION
DRAIN FIELD
BACK PAD AREA
INJECTION MOLDING
FORMER HAZARDOUS MATERIALS RETENTION BASINS
DRY LAGOON (NEVER USED)
FORMER BUILDING FOOTPRINT
PARCEL 1
"NEW" PLATING AREA
"OLD" PLATING AREA
PLASTICS PAINTING AREA
POTENTIAL OFF-SITE AREA REQUIRING FURTHER INVESTIGATION
HAZARDOUS MATERIALS HOLDING PAD
D AVENUE
SOUTH LINE SECTION 14
LEGEND
POWER POLE
LIGHT POLE
SPOT ELEVATION
FENCE LINE
TREE
TREE LINE
SHRUB / BUSH
OVERHEAD UTILITY LINE
CULVERT
PAVED ROAD
UNPAVED ROAD
PROPERTY LINE
POST
SIGN
ELECTRICAL RISER
TELEPHONE RISER
WATER MAIN
CONTOUR MAJOR
CONTOUR MINOR
WATER VALVE
MANHOLE SANITARY SEWER
POTENTIAL BURIED SLUDGE
FORMER SLUDGE PILE
LAGOONS
POTENTIAL OFF-SITE AREA REQUIRING FURTHER INVESTIGATION
HEXAVALENT CHROMIUM & NICKEL SOURCE AREA
FORMER SLUDGE DRYING PIT
FORMER PRODUCTION WELL
Source: Screening Site Inspection Report Aug. 10, 1994
SUSPECTED FORMER PRODUCTION WELL
Source: Unknown
N
North
0
100
200
Scale in Feet

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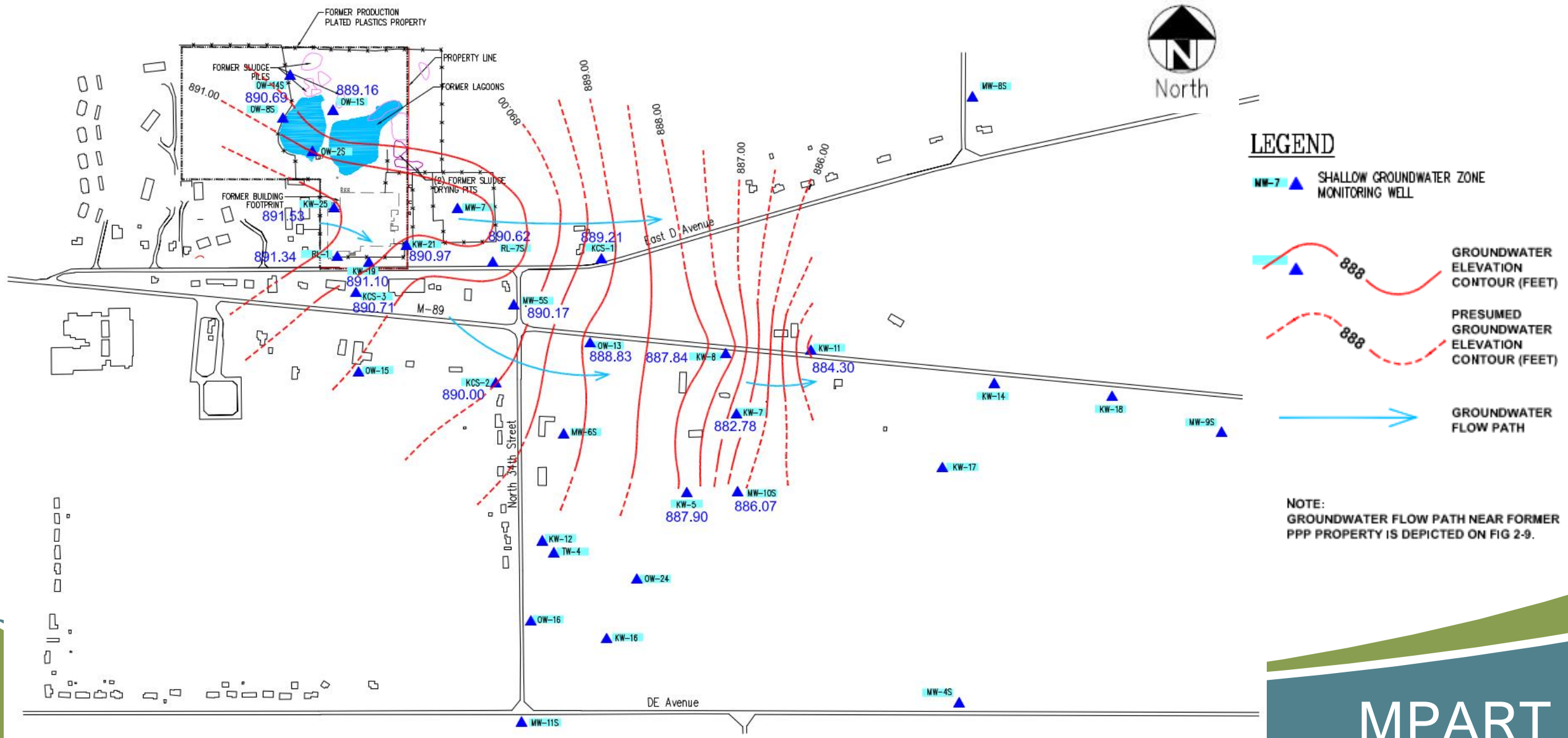
Where have we been?

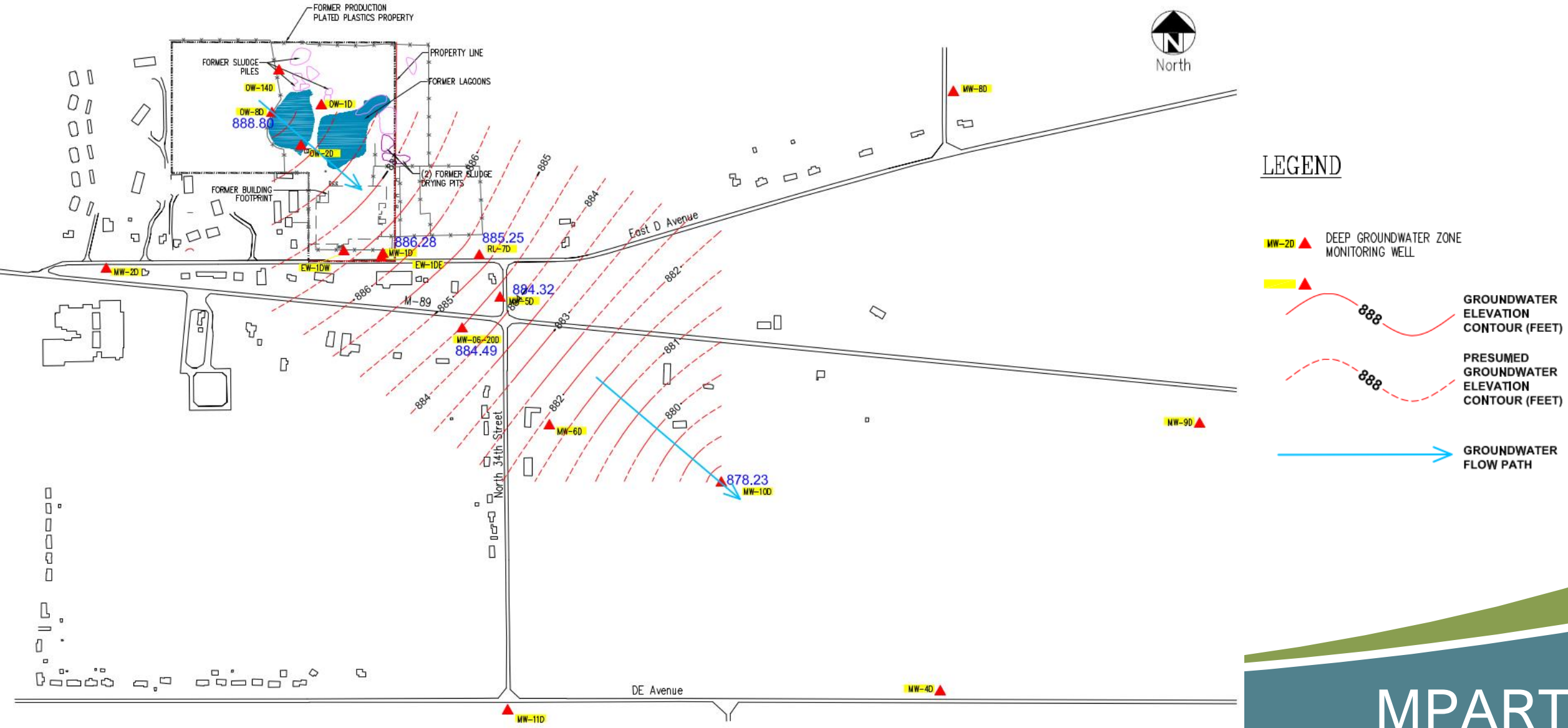
- 2018 – PFAS identified in groundwater cleanup system effluent being discharged to Gull Lake Sewer and Water Authority
  - Cleanup System retrofitted with six 2,000lb GAC vessels for PFAS treatment
  - Begin PFAS Remedial Investigation
- 2021-2022 – Municipal water extended to much of the known area impacted by PFAS within Richland Township
- 2022 – Commenced quarterly groundwater monitoring

Shallow Groundwater Flow– 2013



MPART

Deep Groundwater Flow– 2013



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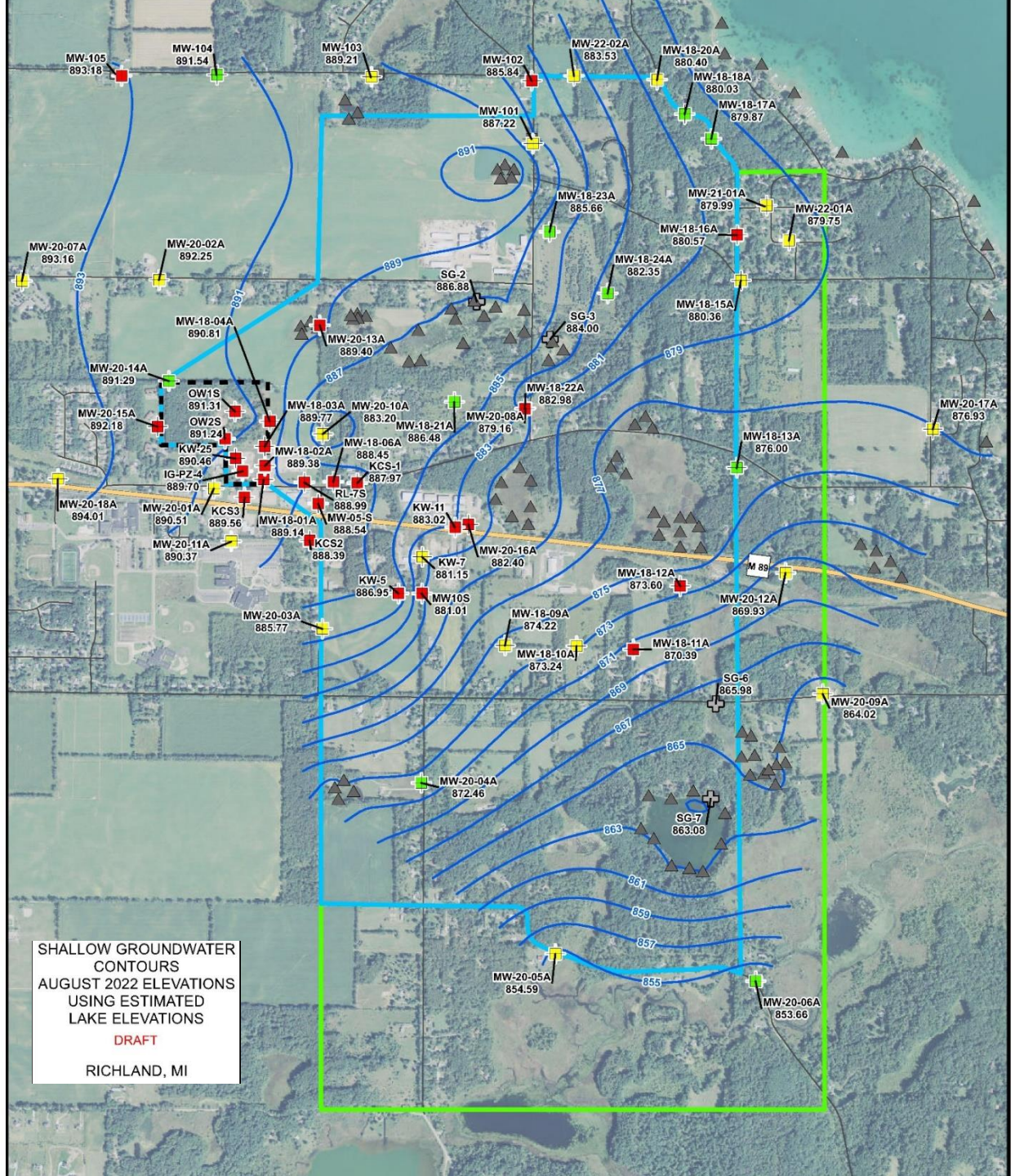
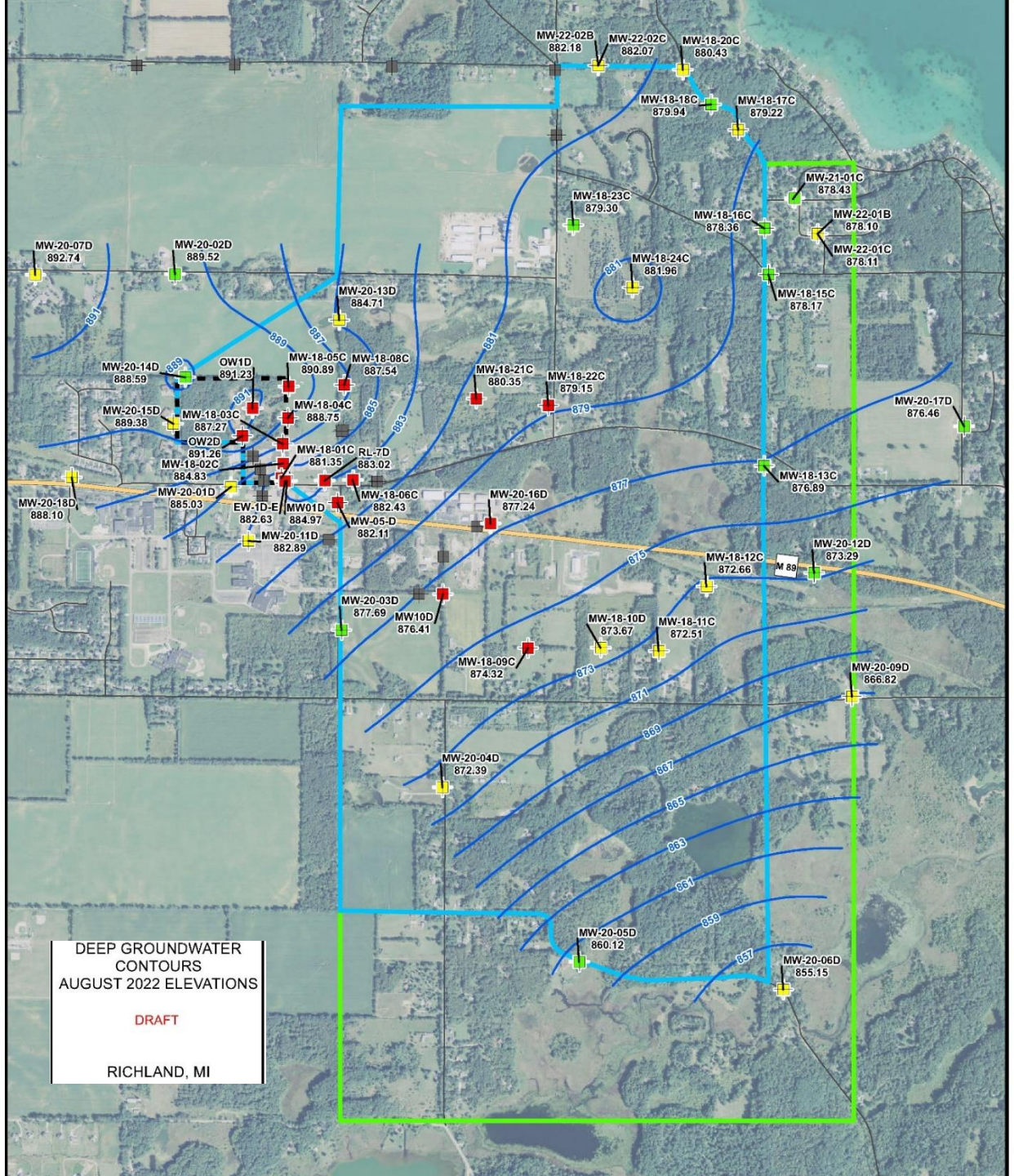

MW-105 893.18
MW-104 891.54
MW-103 889.21
MW-102 885.84
MW-22-02A 883.53
MW-18-20A 880.40
MW-18-18A 880.03
MW-18-17A 879.87
MW-101 887.22
MW-18-23A 885.66
MW-21-01A 879.99
MW-22-01A 879.75
MW-18-16A 880.57
MW-20-07A 893.16
MW-20-02A 892.25
MW-18-24A 882.35
SG-2 886.88
MW-18-15A 880.36
MW-18-04A 890.81
SG-3 884.00
MW-20-13A 889.40
MW-20-14A 891.29
MW-18-22A 882.98
OW1S 891.31
OW2S 891.24
KW-25 890.46
IG-PZ-4 889.70
MW-18-03A 889.77
MW-20-10A 883.20
MW-18-21A 886.48
MW-20-08A 879.16
MW-20-17A 876.93
MW-18-13A 876.00
MW-20-15A 892.18
MW-18-02A 889.38
MW-18-06A 888.45
KCS-1 887.97
RL-7S 888.99
MW-05-S 888.54
KW-11 883.02
MW-20-18A 894.01
MW-20-01A 890.51
KCS3 889.56
MW-18-01A 889.14
KCS2 888.39
MW-20-16A 882.40
MW-20-11A 890.37
KW-7 881.15
KW-5 886.95
MW10S 881.01
MW-18-12A 873.60
MW-20-12A 869.93
MW-20-03A 885.77
MW-18-09A 874.22
MW-18-10A 873.24
MW-18-11A 870.39
SG-6 865.98
MW-20-09A 864.02
MW-20-04A 872.46
SG-7 863.08
MW-20-05A 854.59
MW-20-06A 853.66
SHALLOW GROUNDWATER CONTOURS AUGUST 2022 ELEVATIONS USING ESTIMATED LAKE ELEVATIONS
DRAFT
RICHLAND, MI


MW-22-02B 882.18
MW-22-02C 882.07
MW-18-20C 880.43
MW-18-18C 879.94
MW-18-17C 879.22
MW-21-01C 878.43
MW-18-23C 879.30
MW-22-01B 878.10
MW-18-16C 878.36
MW-22-01C 878.11
MW-20-07D 892.74
MW-20-02D 889.52
MW-18-24C 881.96
MW-18-15C 878.17
MW-20-13D 884.71
MW-20-14D 888.59
OW1D 891.23
MW-18-05C 890.89
MW-18-08C 887.54
MW-18-21C 880.35
MW-18-22C 879.15
MW-20-17D 876.46
MW-20-15D 889.38
MW-18-03C 887.27
MW-18-04C 888.75
OW2D 891.26
MW-18-01C 881.35
RL-7D 883.02
MW-18-02C 884.83
MW-18-13C 876.89
MW-20-18D 888.10
MW-20-01D 885.03
EW-1D-E 882.63
MW01D 884.97
MW-18-06C 882.43
MW-20-16D 877.24
MW-05-D 882.11
MW-20-11D 882.89
MW-20-12D 873.29
MW-18-12C 872.66
MW-20-03D 877.69
MW10D 876.41
MW-18-10D 873.67
MW-18-11C 872.51
MW-18-09C 874.32
MW-20-09D 866.82
MW-20-04D 872.39
MW-20-05D 860.12
MW-20-06D 855.15
DEEP GROUNDWATER CONTOURS AUGUST 2022 ELEVATIONS
DRAFT
RICHLAND, MI

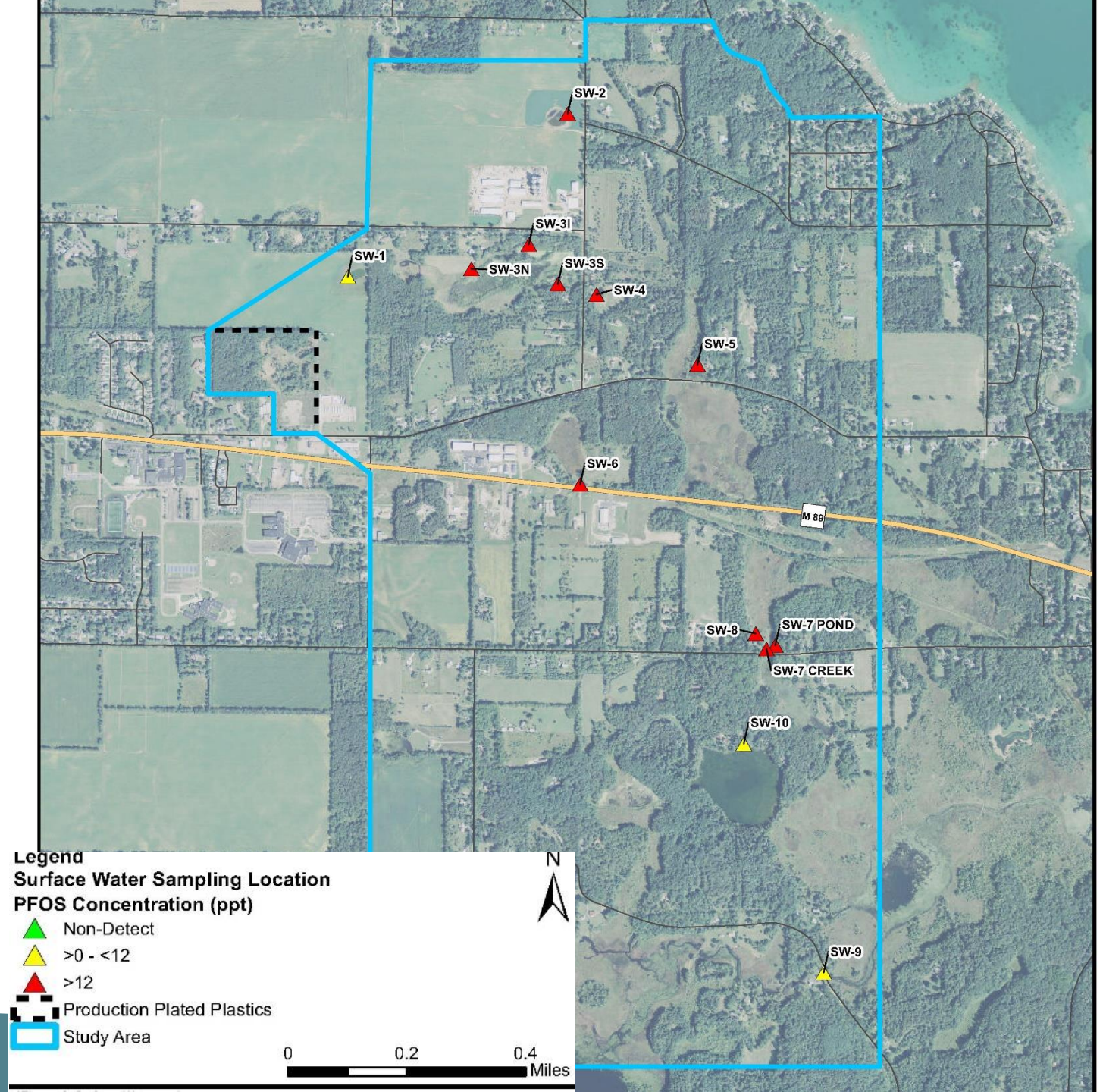
2019
Water Resources Division
Surface Water Data

- Sample results were below criteria

Compound	Criteria (ng/L)
PFOS	12
PFOA	170
PFBS	670,000
PFNA	30

2019 RRD
Surface Water Data

Critera	170	30	670000	12
Location ID	PFOA	PFNA	PFBS	PFOS
SW-3N	ND	ND	ND	152
SW-3S	ND	ND	ND	316
SW-4	3.15	ND	ND	67.4
SW-5	ND	ND	ND	41
SW-6	1.75	ND	ND	19.6
SW-7 POND	ND	1.93	ND	40.8
SW-7 POND	ND	1.88	ND	42.5
SW-7 CREEK	ND	ND	2.47	17.9
SW-10	ND	ND	ND	1.75
SW-8	ND	ND	ND	67.5
SW-9	ND	ND	ND	1.64
SW-3I	ND	ND	ND	142
SW-2	ND	ND	ND	15
SW-1	ND	ND	ND	5.4

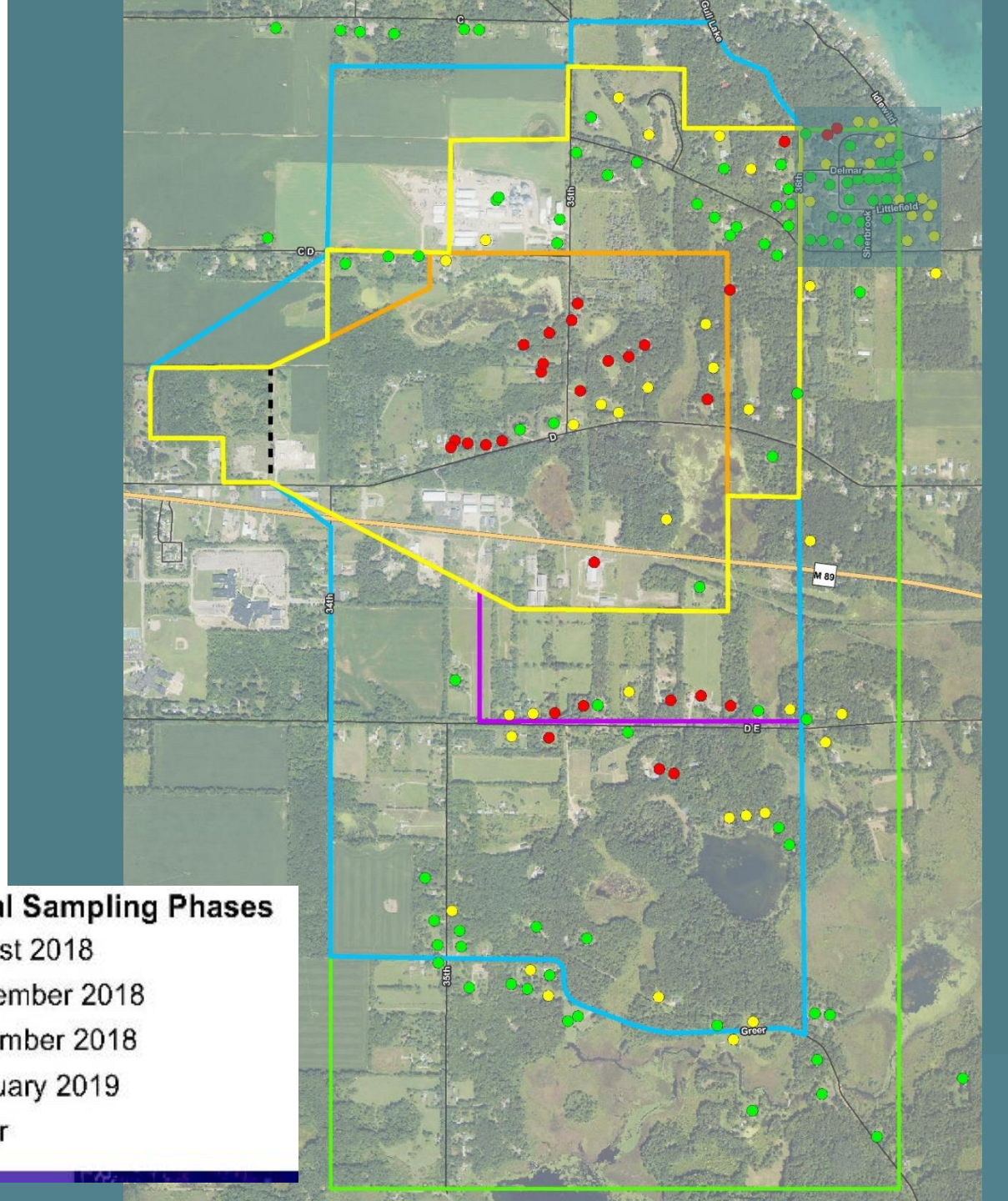


Where are we now?

- Residential Wells
  - 4 Phases of sampling
  - Later phases guided by well results

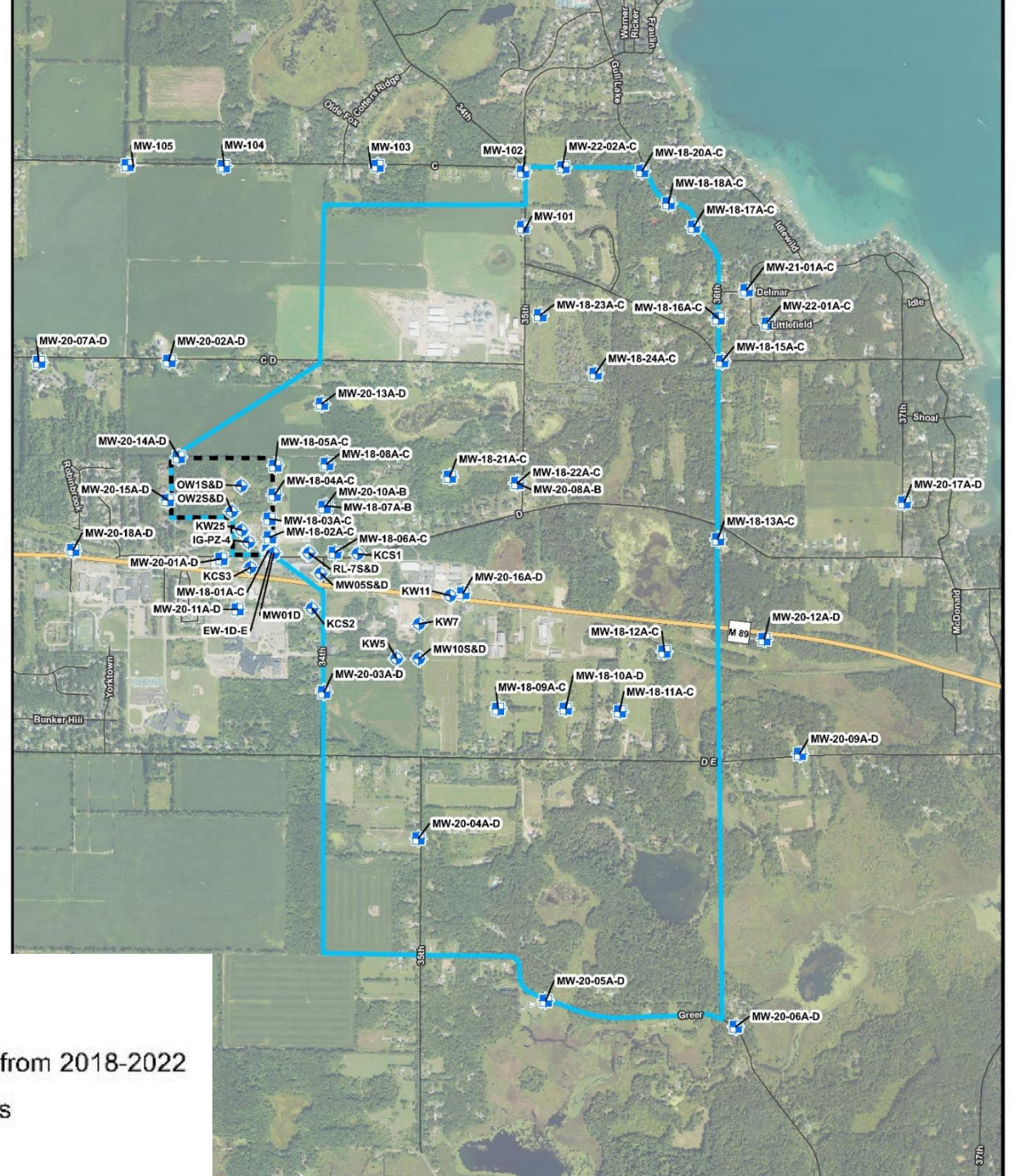
	Exceed Criteria	Between ND and Criteria	ND
Richland Township	26	28	58
Ross Township	2	21	33
Residential Total	**28**	**49**	**91**
Total Residential Wells Sampled since 2018	**168**		

PFAS Compound	Part 201 Residential and Nonresidential Drinking Water Criteria (ng/L or ppt)
Perfluorobutane Sulfonic Acid (PFBS)	420
Perfluorohexane Sulfonic Acid (PFHxS)	51
Perfluorohexanoic Acid (PFHxA)	400,000
Perfluorononanoic acid (PFNA)	6
Perfluorooctanoic Acid (PFOA)	8
Perfluorooctane Sulfonic Acid (PFOS)	16
Hexafluoropropylene Oxide Dimer Acid (GenX)	370



Where are we now?

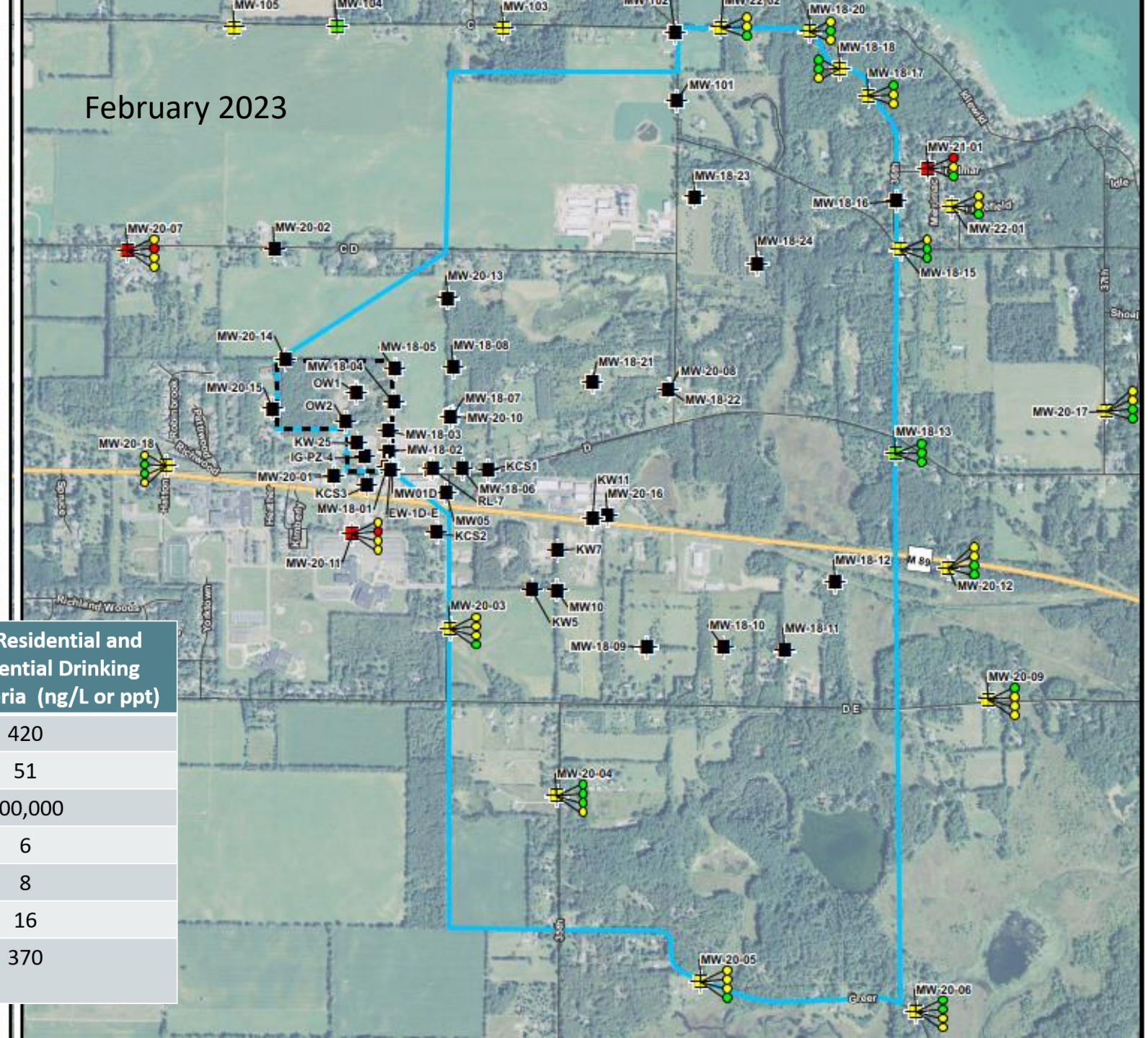
- Groundwater Monitoring Wells
  - Existing: 21 wells, 80 samples collected
  - 2018: 66 wells installed; 282 samples collected
  - 2020: 68 wells installed; 286 samples collected
  - 2021/22: 14 wells installed; 66 samples collected
  - Quarterly sampling conducted in 2022-2023



Quarterly PFAS Groundwater Results

Legend
Monitoring Well

- Non-Detect for Part 201 PFAS Compounds
- Detection below Part 201 PFAS Criteria, but no Exceedance
- One or more Part 201 PFAS Criteria Exceeded
- Not Sampled



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Perfluorooctanoic Acid (PFOA)	8
Perfluorooctane Sulfonic Acid (PFOS)	16
Hexafluoropropylene Oxide Dimer Acid (GenX)	370

Where are we now?

Legend

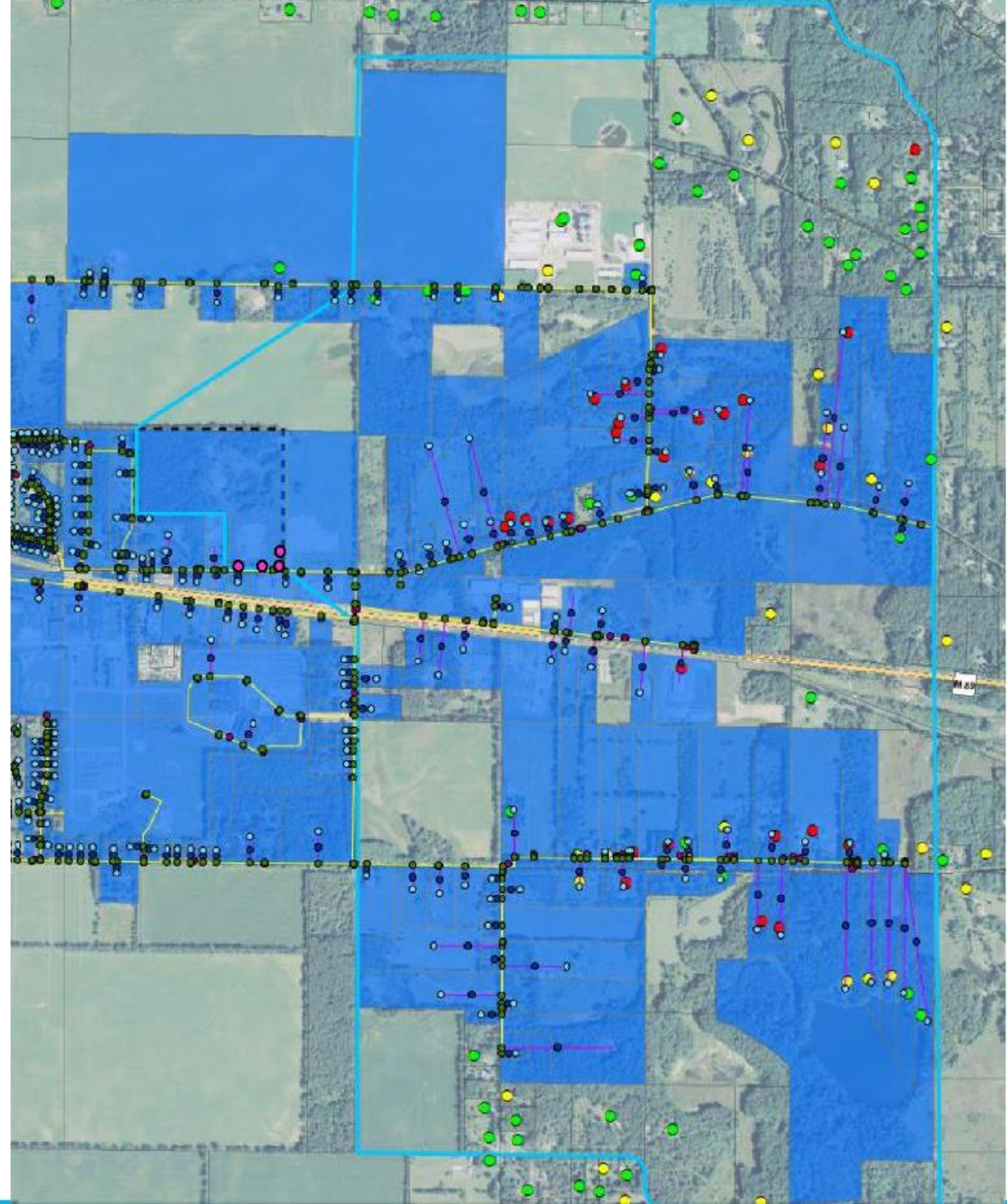
Residential Well Sampling Location

- Non-Detect for Part 201 PFAS Compounds
- Detection below Part 201 PFAS Criteria, but no Exceedance
- One or more Part 201 PFAS Criteria Exceeded
- Parcel Boundary
- Parcel with New Municipal Water Connection
- Production Plated Plastics
- Study Area

Legend

- Fittings
- Hydrant Valves
- Hydrants
- Meters
- Service Connections
- System Valves
- Mains
- Service Lines

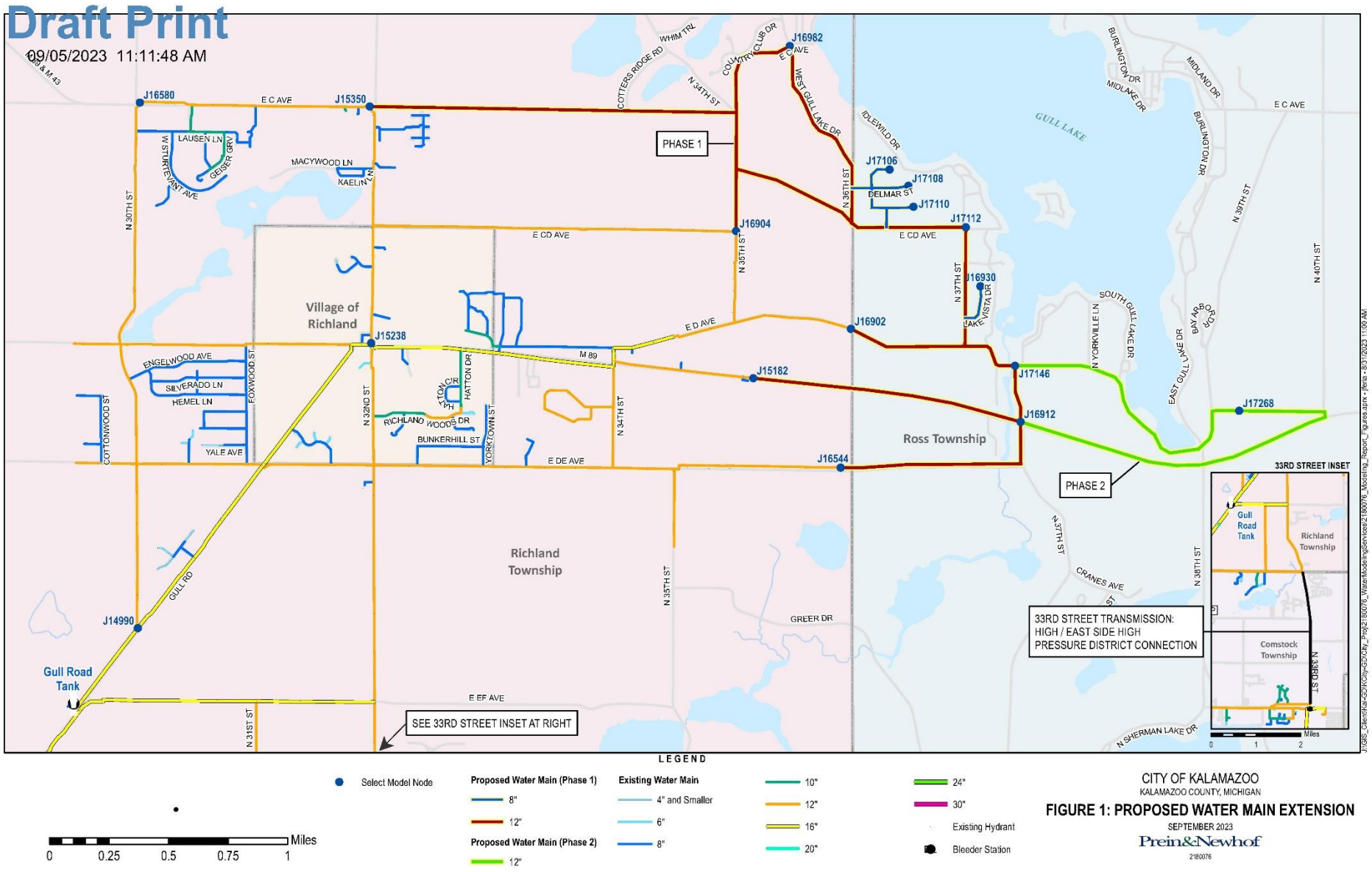
N



Where are we going?

- Treatment system decommissioning
  - Injections to decrease concentrations of metals migrating offsite
- Long-term groundwater monitoring for PFAS at perimeter wells only
- Potential evaluation of the groundwater surface water interface pathway at Gull Lake
- Working with the local communities on a long-term solution to mitigate current and potential future exposure to PFAS in the groundwater via the drinking water pathway

Proposed Municipal Water Extension



MPART

North 34th Street

- The vicinity of 9899 East D Avenue, in Richland Township, Michigan is served by the City of Kalamazoo CWS (East Side High Pressure District)
  - Currently on annual compliance monitoring for PFAS:
  - Compliance monitoring sample results to date have been **non-detect** or **below PFAS MCLs** or for all tested PFAS

Public Drinking Water

James Baker, Public Services Director &
City Engineer, City of Kalamazoo

Long Term Drinking Water Recommendations

Specific locations may need to consider future long-term plans for clean safe drinking water alternative sources

Well replacements may not be a feasible alternative

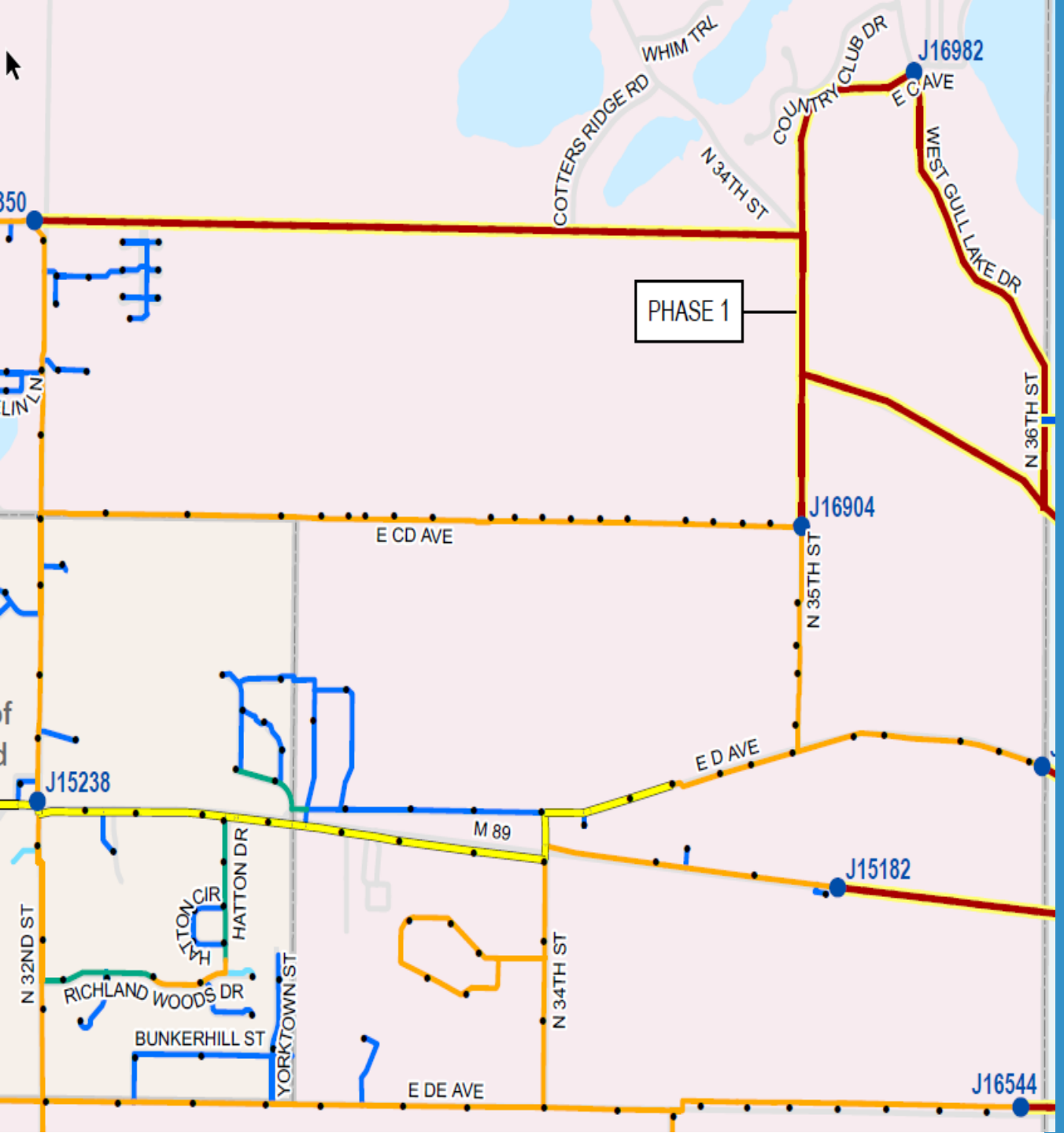
Filters are not considered a viable long-term solution

Proposed Alternative, Kalamazoo Regional Water System Expansion

Previous Kalamazoo municipal extensions successful in solving PFAS contamination in Parchment, Cooper Township and Richland Township

Funding programs available

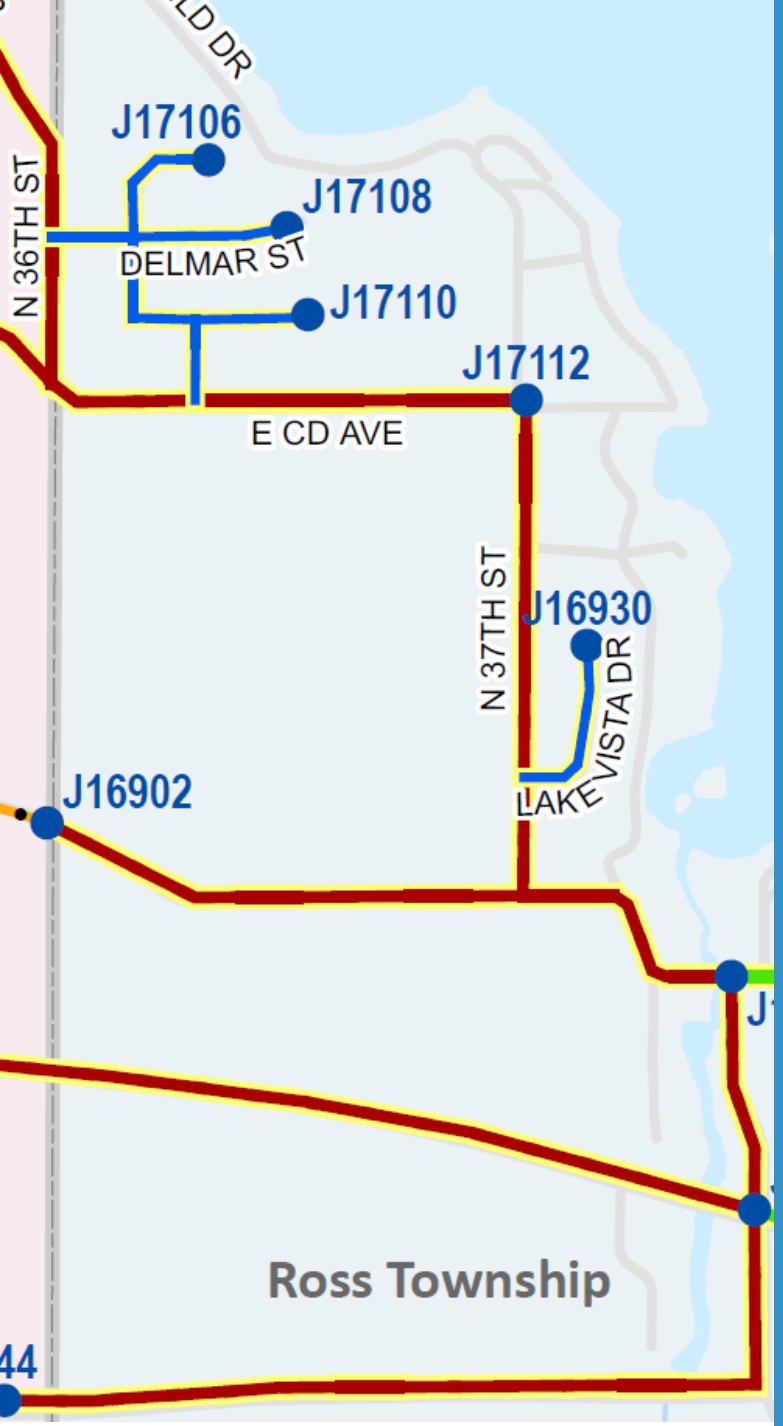
Parchment, Cooper Township and Richland Township extensions connected over 1700 customer locations at no direct customer cost



Proposed Alternative, Richland Twp Water System Expansion

Richland Township water main extensions focused within near and known PFAS investigation areas

Fire hydrants and available fire protection provides an additional benefit and likely reduction in homeowners insurance rates

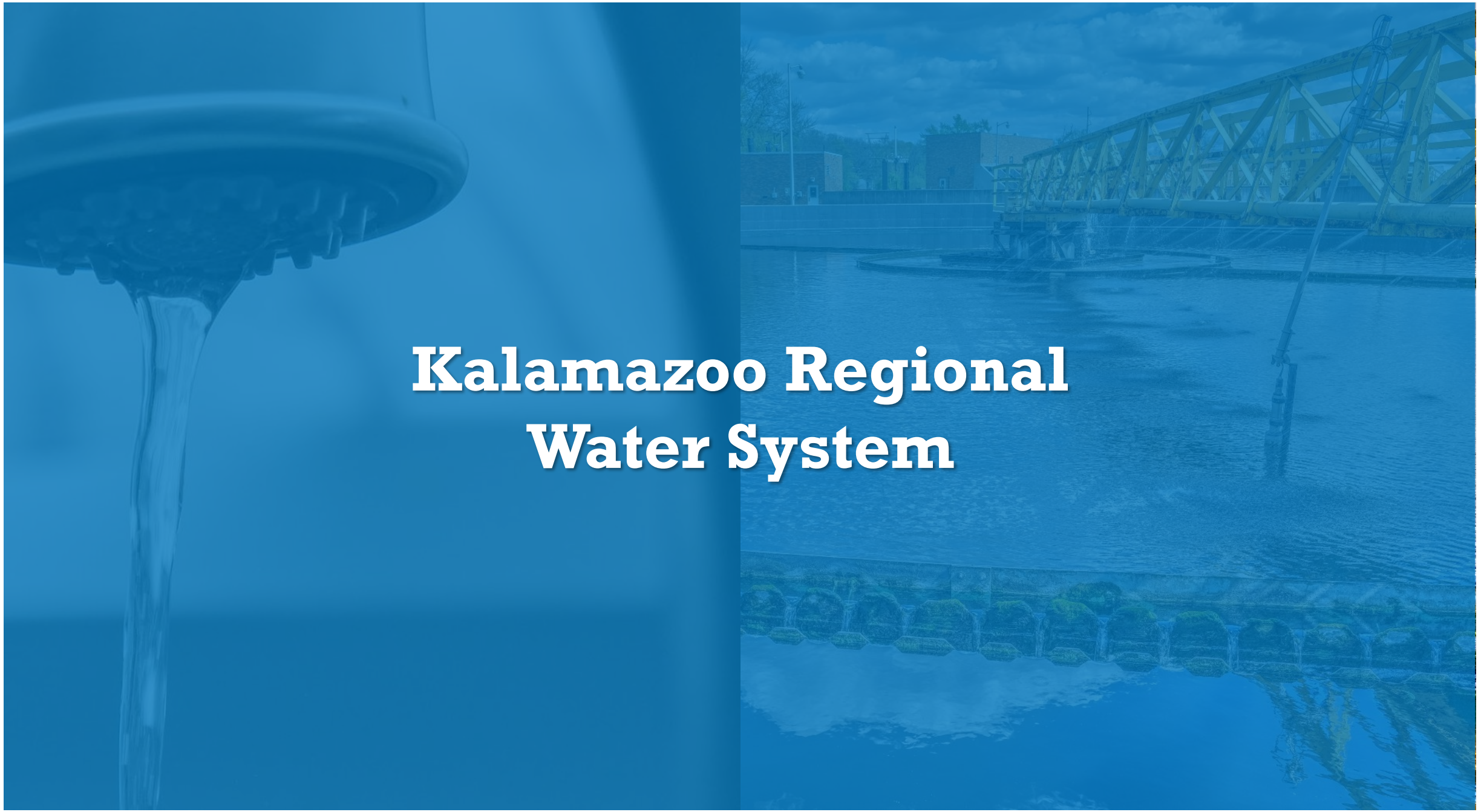


Proposed Alternative, Ross Twp Water System Expansion

Ross Township water main extensions focused within near and known PFAS investigation areas

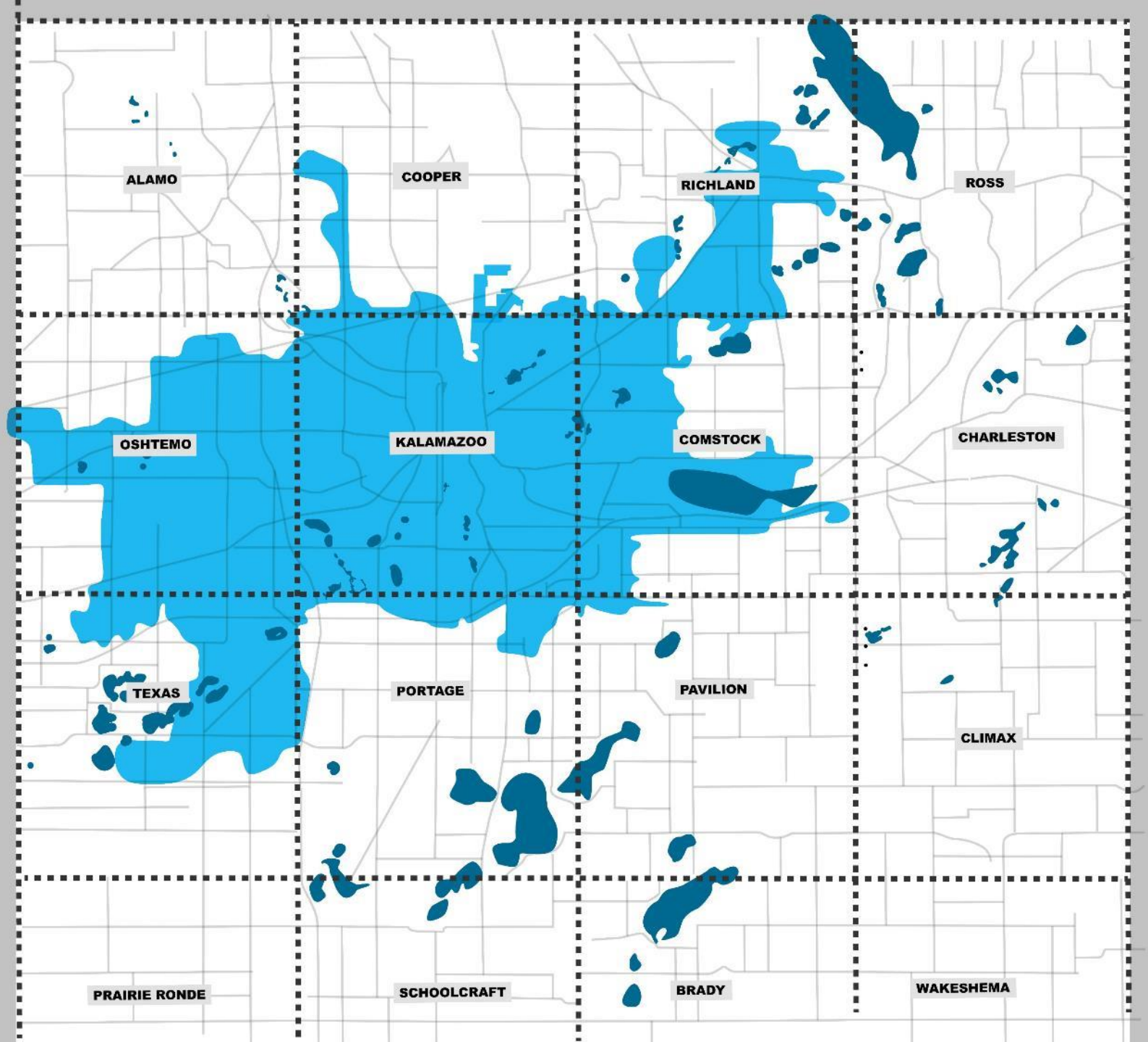
Transmission main (red) and distribution main (blue) to serve the Gull Vista Plat and the Indian Point Plat

Fire hydrants and available fire protection provides an additional benefit and likely reduction in homeowners insurance rates



Kalamazoo Regional Water System

Kalamazoo Water system



Michigan's largest groundwater-only water supply

- 41,669 connections
- 839 miles of water main
- 7,000 fire hydrants
- 11 elevated storage facilities
- 11 municipal jurisdictions
- 20 booster/bleeder stations
- 13 point of entry treatment plants
- 94 production wells

- 16 US Geological Survey gauge stations
- 38 million gallons per day average max demand
- 46 million gallons per day max demand (1988)
- 11 municipal jurisdictions represented by 7 voting members to determine Policy and Rates - UPC

DWSRF FY2025 Application Timeline

November 1, 2023 – Submit Intent to Apply (ITA) form to EGLE

April 2024 – Complete Project Plan and hold Public Hearing

May 1, 2024 – Submit Project Plan to EGLE

September 2024 – Receive ranking and funding priority from EGLE

October 2024 to September 2025 – Begin construction

Resources to gain knowledge of contamination

- Sites of Environmental Contamination:
  - https://www.mcgi.state.mi.us/environmentalmapper/
- Residential Drinking Water Well Viewer
  - https://www.mcgi.state.mi.us/waterwellviewer/
- MPART Website tour:
  - https://www.michigan.gov/pfasresponse/
- Contact MDHHS Drinking Water Hotline at 800-648-6942.

MICHIGAN PFAS ACTION RESPONSE TEAM (MPART)

www.Michigan.gov/PfasResponse

EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Michigan Department of AGRICULTURE & Rural Development

MDHHS
Michigan Department of Health & Human Services

MDOT
Michigan Department of Transportation

DEPARTMENT OF NATURAL RESOURCES DNR MICHIGAN

LARA
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CUSTOMER DRIVEN. BUSINESS MINDED.

DEPARTMENT OF MILITARY AND VETERANS AFFAIRS MICHIGAN

Questions?