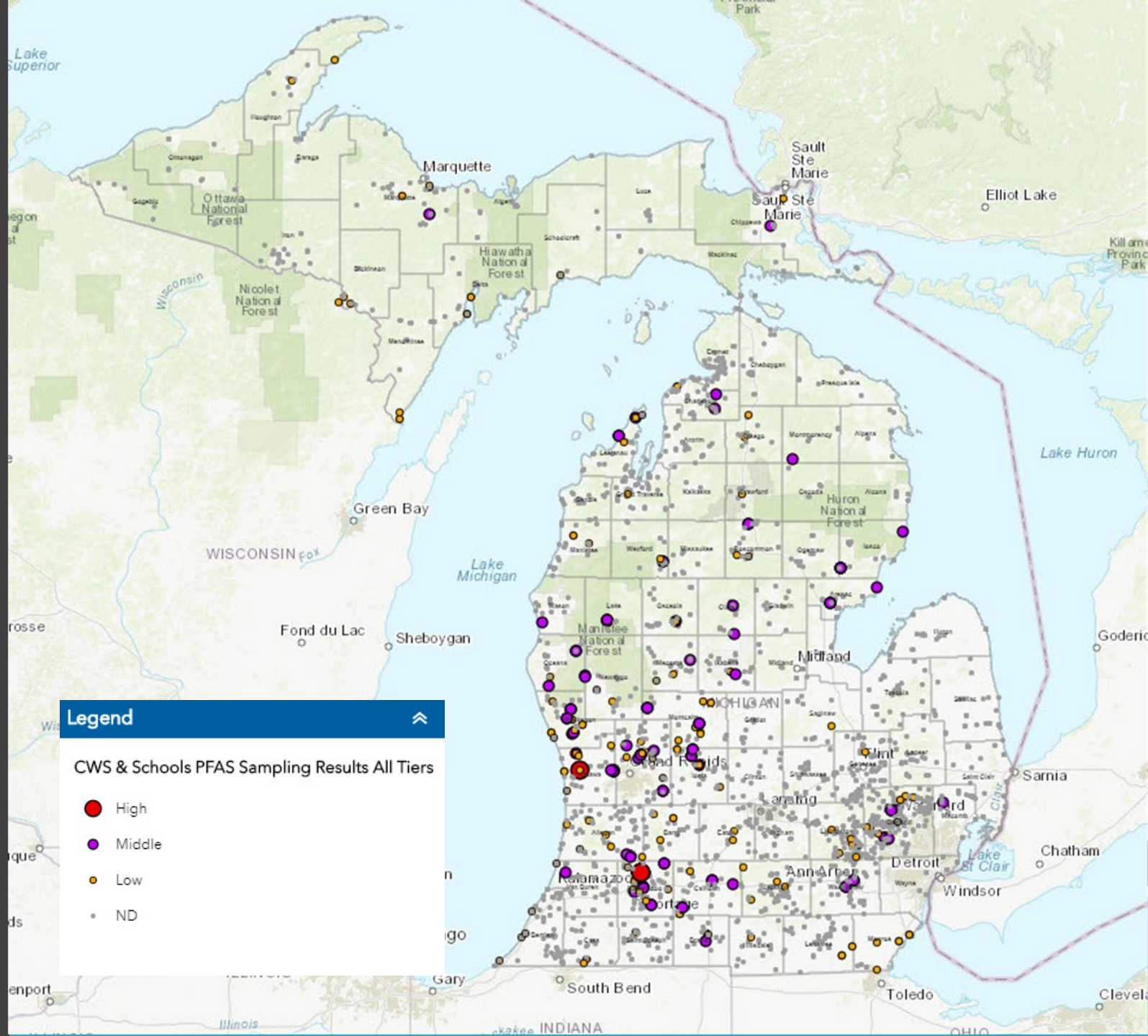
The Path to a PFAS MCL

A Timeline of Michigan's Rulemaking Process for Creating a Maximum Contaminant Level (MCL) Rule(s) for Per- and Polyfluoroalkyl Substances (PFAS)

George Krisztian, Assistant Director
Drinking Water and Municipal Assistance Division
Michigan Department of Environmental Quality

Statewide Survey

- Type I Community Water Supplies
  - Surface Water Systems
  - Groundwater Systems
  - Combination SW/GW Systems
- Type II Non-transient Non-community Water Supplies
  - Schools
  - Child Care Providers
  - MI Head Start Programs
- Federally-recognized Tribal Water Supplies



Supply Type	Supplies Sampled	Non-Detect Total Tested PFAS	< 10ppt Total Tested PFAS (non-ND)	10 – 70ppt PFOA/PFOS (> 10ppt Total Tested PFAS)	> 70ppt PFOA/PFOS
CWS	1,114	994	84	35	1
Schools	461	420	21	19	1
Tribal Entities	17	17	0	0	0
Child Care Providers/MI Head Start Programs	152	134	10	8	0
Total Supplies	1,744	1,565	115	62	2
Approx. Population Served	7.7 million	5.8 million	1.4 million	490,000	3,500

Public Water Supply Testing Results

as of 4/1/2019

Supply Type	Supplies Sampled	PFBS	PFHxA	PFHpA	PFHxS	PFOA	PFNA	PFOS	PFDA	MeFOSAA	EtFOSAA	PFUnA	PFDoA	PFTrDA	PFTeDA
Community Water Supplies	1,114	63	46	13	42	47	1	24	0	0	1	0	0	0	0
Schools on Wells	461	18	27	8	14	19	2	9	0	3	1	0	0	0	0
Tribes	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Child Care /MI Head Start	152	13	8	3	6	5	0	5	0	0	1	0	0	0	0
Total	**1,744**	**94**	**81**	**24**	**62**	**71**	**3**	**38**	**0**	**3**	**3**	**0**	**0**	**0**	**0**

Statewide Drinking Water Testing Initiative Results
Individual PFAS Analytes from EPA Method 537 v. 1.1

Municipal Water System Testing

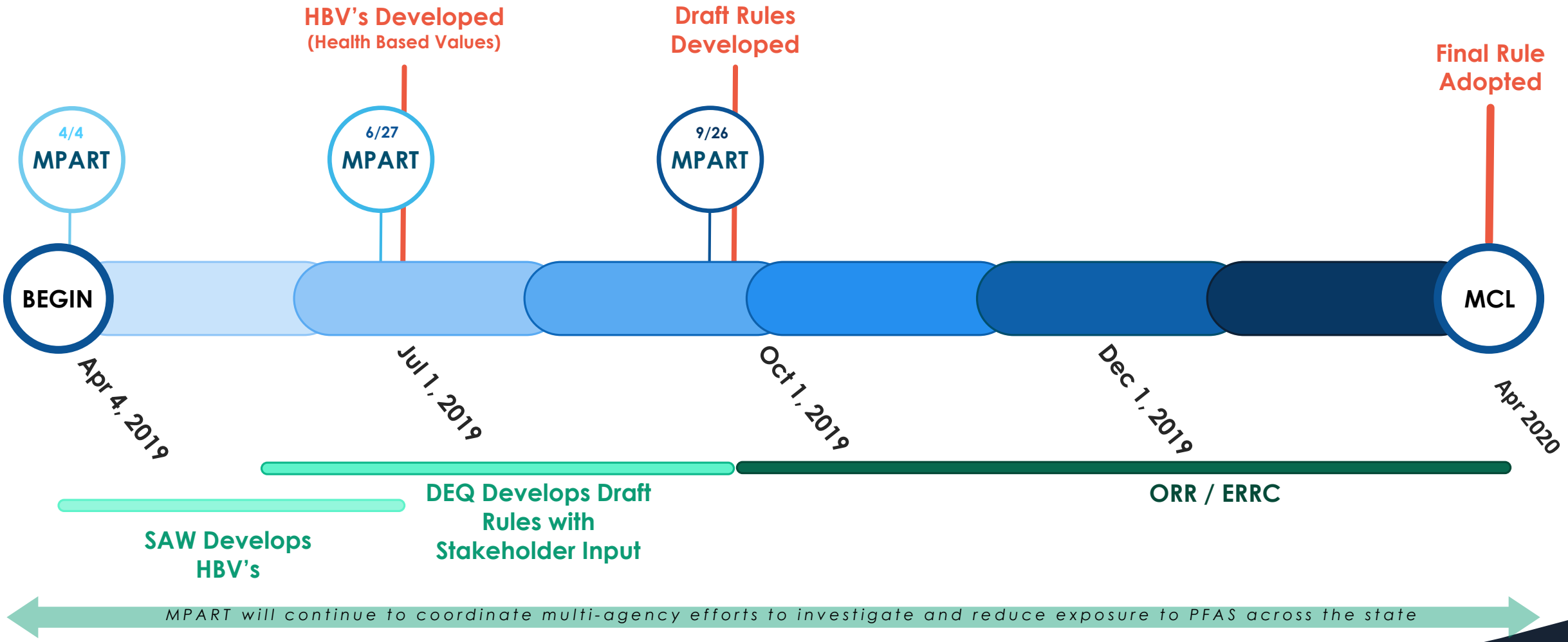
as of 4/1/2019

Next Steps: The Middle Tier & Beyond

- Middle Tier Supplies
  - Quarterly monitoring program
  - Coordination with MDEQ RRD district staff and MDHHS drinking water staff to provide standardized high-level environmental review
  - Continue to work with state agencies and local health departments to provide guidance
- Drinking Water Sampling for Seasonal Supplies
- Additional sampling to meet the mission of the Drinking Water Workgroup:

"Identify and quantify public exposure to PFAS compounds in public drinking water systems."

Overview of MCL Process



Additional Considerations

- Cost of Treatment
- Efficacy of Treatment / Best Available Technology (BAT)
- Disposal of PFAS removed from water
- Issues identified in stakeholder meetings

Additional Considerations Cont.

- Analytical Methodology
- Laboratory Certification Process
- Monitoring (Frequency and Triggers)
- Compliance Phase in Process (Immediate vs Delayed)

Questions?

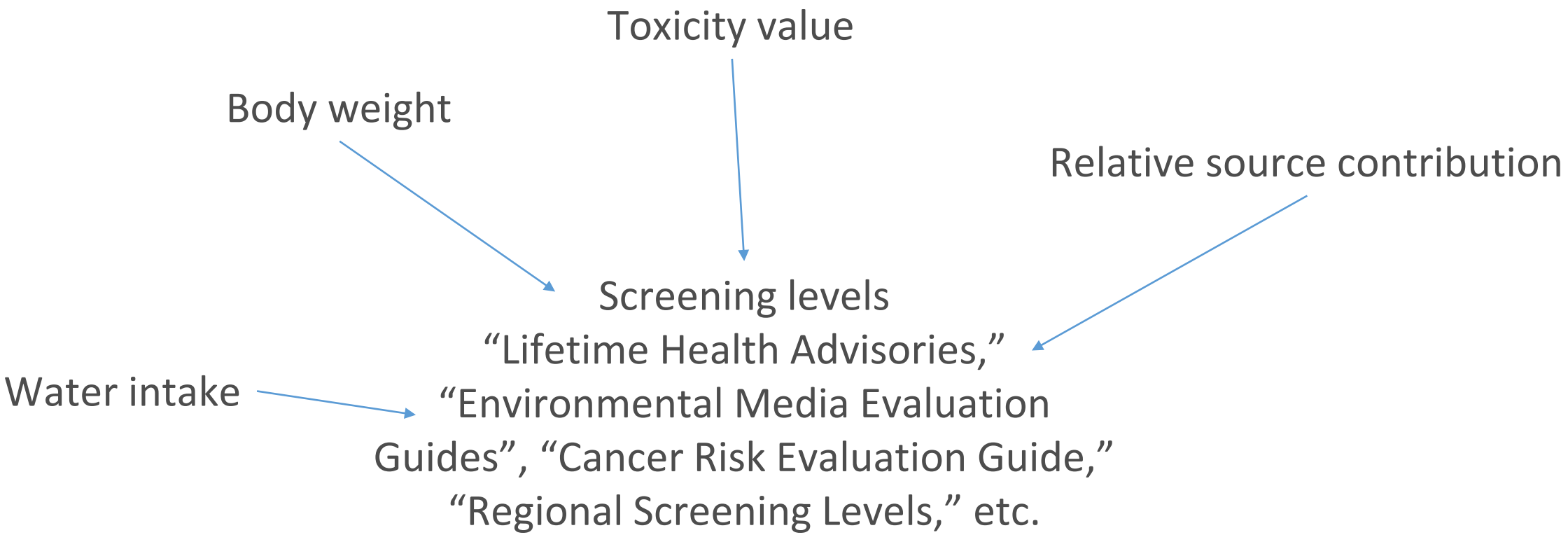
PFAS Public Health Drinking Water Screening Levels

Jennifer Gray, PhD
MPART Human Health Workgroup
Michigan Department of Health and Human Services

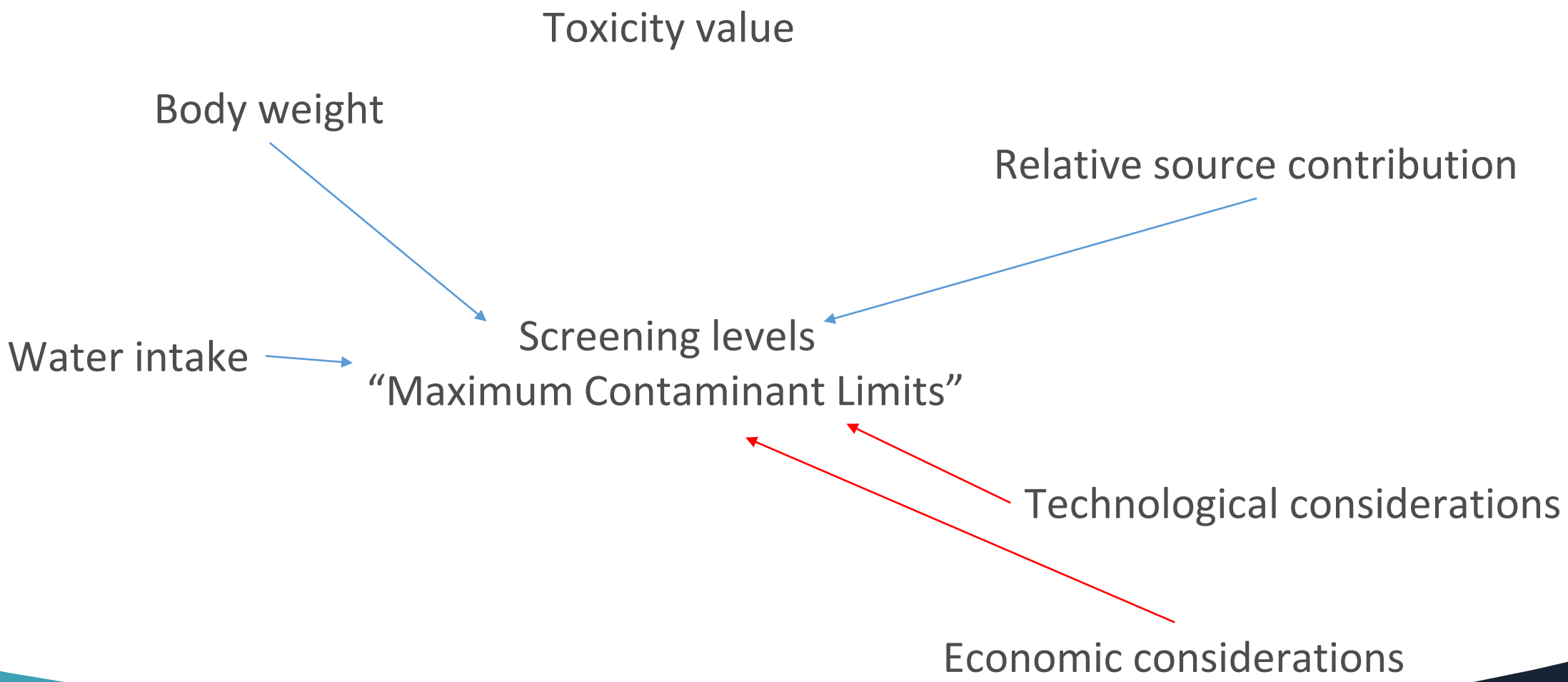
Outline

- Background on screening level development
- Previous MPART assignments
  - Identify other agency PFAS values nationwide
  - Develop PFAS public health drinking water screening levels
- Overview of PFAS public health drinking water screening levels

Development of screening levels



Development of regulatory levels



	US EPA MCLs (ppb)	ATSDR Child Chronic EMEG (ppb)	ATSDR Adult Chronic EMEG (ppb)	ATSDR CREG (ppb)	US EPA LHA (ppb)	US EPA Tapwater RSL (ppb)	MDEQ Part 201 Residential Drinking Water Criteria (ppb)
Arsenic	10	2.1	7.8	0.016	NA	0.052 (C)/6 (NC)	10 (MCL)
Benzene	5	3.5	13	0.44	3	0.46 (C)/33 (NC)	5.0 (MCL)
Chloropyrifos	NA	7	26	NA	2	8.4 (NC)	22
Diazionon	NA	4.9	18	NA	1	10 (NC)	1.3
Dibromochloromethane	80 (TTHM)	630	2,300	0.29	60 (TTHM)	0.87 (C)/380 (NC)	80 (TTHM)
1,4-Dioxane	NA	700	2,600	0.24	200	0.46 (C)/57 (NC)	7.2
Ethylbenzene	700	NA	NA	NA	700	1.5 (C)/810 (NC)	74 (aesthetic)
Malathion	NA	140	520	NA	500	390 (NC)	NA
Pentachlorophenol	1	7	26	0.061	40	0.041 (C)/23 (NC)	1.0 (MCL)
Selenium	50	35	130	NA	50	100 (NC)	50 (MCL)
Tetrachloroethylene	5	56	210	12	10	11 (C)/41 (NC)	5.0 (MCL)
Trichloroethylene	5	3.5	13	0.43	NA	0.49 (C)/2.8 (NC)	5.0 (MCL)
Xylenes, total	10,000	1,400	5,200	NA	NA	190 (NC)	280 (aesthetic)

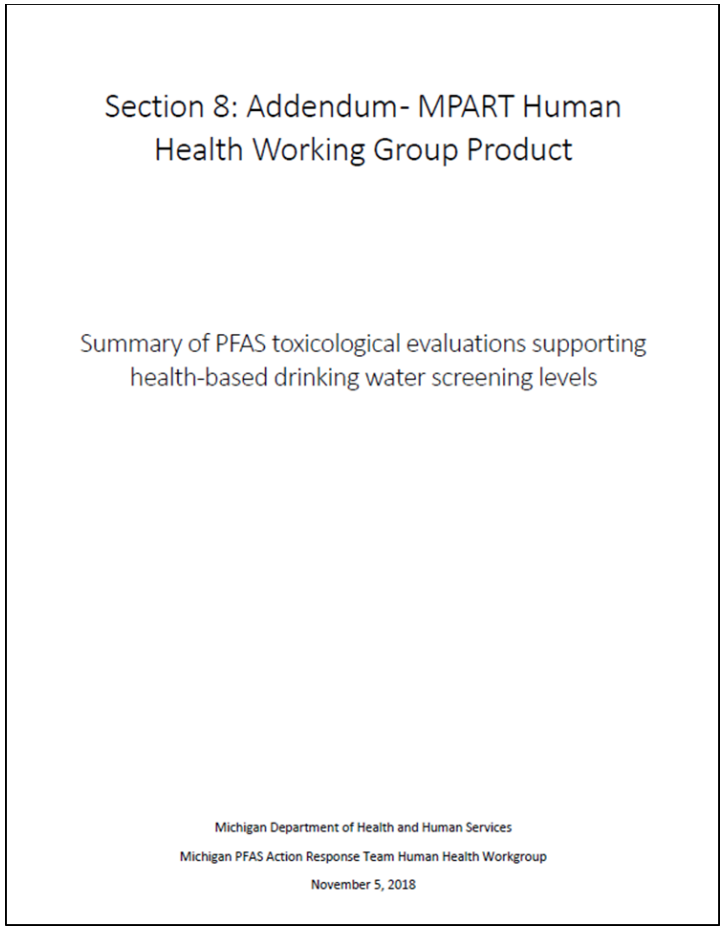
Previous MPART assignments

- Review and documentation of other agencies' PFAS drinking water values
  - Description of available PFAS drinking water values (living document)

- MPART direction to develop public health drinking water screening levels
  - Timeline provided required that we evaluate and build off of available work

Other agencies PFAS values

- Compiled other agency PFAS drinking water values with a focus on PFAS that had been detected in Michigan
- Some agencies address individually, some combined
- Consider this a living document


Section 8: Addendum- MPART Human Health Working Group Product

Summary of PFAS toxicological evaluations supporting health-based drinking water screening levels

Michigan Department of Health and Human Services

Michigan PFAS Action Response Team Human Health Workgroup

November 5, 2018

Previous MPART assignments

- Review and documentation of other agencies' PFAS drinking water values
  - Description of available PFAS drinking water values (living document)

- MPART direction to develop public health drinking water screening levels
  - Timeline provided required that we evaluate and build off of available work

Selected PFAS

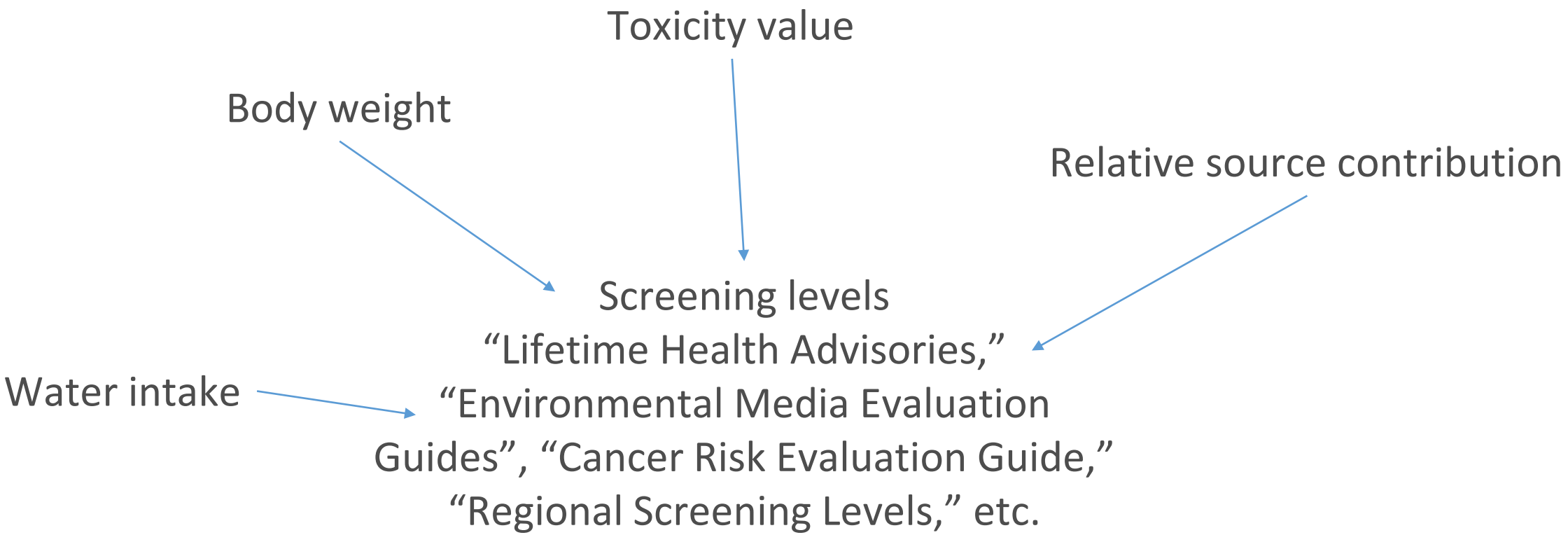
Moved forward:

- PFOA
- PFOS
- PFHxS
- PFNA
- PFBS

Further evaluation needed:

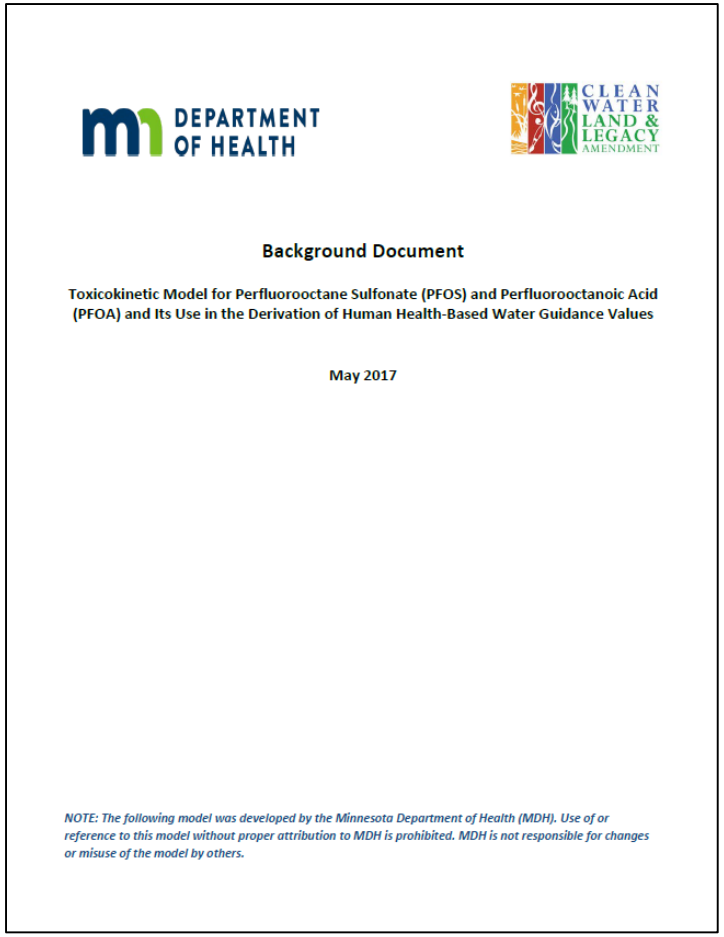
- PFBA
- PFHpA
- PFHxA
- PFPeA
- 6:2 FTS

Development of screening levels



MDH Toxicokinetic Model

- "However, PFOS and PFOA have unique characteristics that are not adequately addressed when using this traditional approach."
- "PFOA and PFOS bioaccumulate in serum, cross the placenta, and are excreted into breastmilk."
- Reviewers of the model and recently published for PFOA



DEPARTMENT OF HEALTH

CLEAN WATER LAND & LEGACY AMENDMENT

Background Document

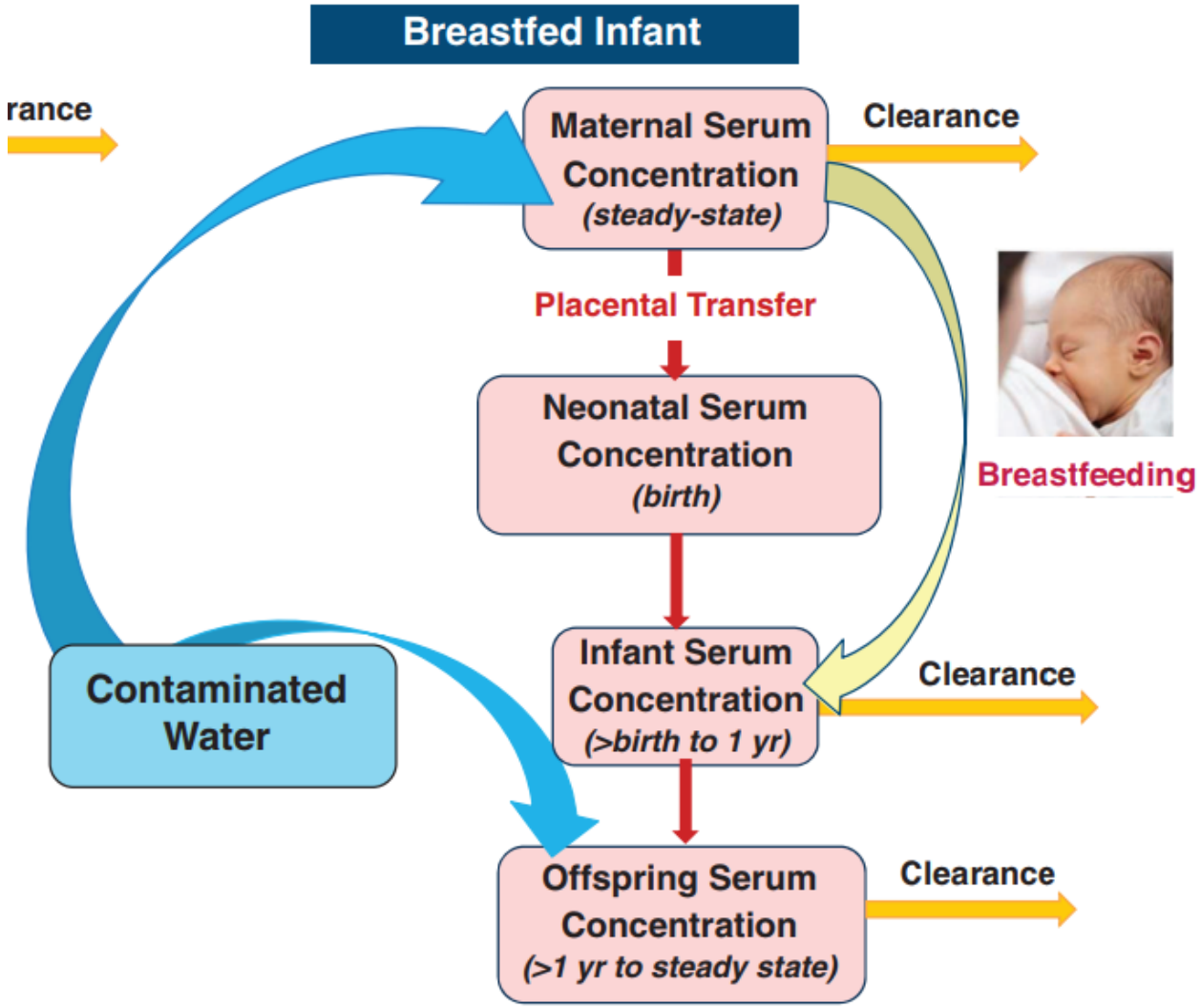
Toxicokinetic Model for Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA) and Its Use in the Derivation of Human Health-Based Water Guidance Values

May 2017

NOTE: The following model was developed by the Minnesota Department of Health (MDH). Use of or reference to this model without proper attribution to MDH is prohibited. MDH is not responsible for changes or misuse of the model by others.

MDH Toxicokinetic Model

- One-compartment model to predict serum concentrations of PFOS and PFOA from birth through attainment of steady-state conditions



Toxicity value used in the toxicokinetic model

- Serum PFOA, PFOS, PFHxS, and PFNA levels (average levels calculated by ATSDR) divided by the uncertainty and modifying factors
- Results in serum level associated with the toxicity value
- Serum levels used in development of these screening levels are not meant to indicate a level where health effects are likely. These serum levels are calculated to be at a point where no or minimal risk exists for people drinking water with a certain PFAS.

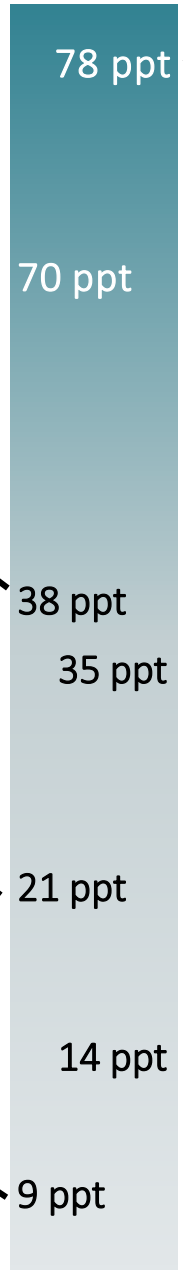
PFOA

USEPA Lifetime Health Advisory, for PFOA individually or in combination with PFOS (2016)
- Water intake for a woman who is breast-feeding
- USEPA RfD
- Daily exposure
- 20% Relative Source Contribution

NH Dept of Environmental Services proposed MCL
- Water intake for a woman who is breast-feeding
- NH RfD
- Daily exposure
- 40% Relative Source Contribution

ATSDR Environmental Media Evaluation Guide for children (2018)
- Water intake for children less than 1 year old
- ATSDR MRL
- Daily exposure
- No Relative Source Contribution

MDHHS screening level, MDH toxicokinetic model
- Water intake varies by age
- ATSDR MRL
- Daily exposure
- 50% Relative Source Contribution



ATSDR Environmental Media Evaluation Guide for adults only (2018)
- Adult drinking water intake
- ATSDR MRL
- Daily exposure
- No Relative Source Contribution

Minnesota Dept. of Health, protective of breast-feeding infants, both from exposure they may receive prenatally and while breast-feeding (2018)
- Water intake varies by age
- USEPA RfD
- Daily exposure
- 50% Relative Source Contribution

New Jersey Dept Environmental Protection (2017)
- Adult drinking water intake
- NJ RfD
- Daily exposure
- 20% Relative Source Contribution

NY Proposed MCL: 10 ppt (not all details are available yet)

MDHHS-led Human Health Workgroup PFAS public health drinking water screening levels

PFAS	MDHHS Public Health Drinking Water Screening Level
PFOA	9 ng/L (parts per trillion [ppt])
PFOS	8 ng/L (ppt)
PFNA	9 ng/L (ppt)
PFHxS	84 ng/L (ppt)
PFBS	1000 ng/L (ppt)

PFBS public health drinking water screening level calculated using standard exposure parameters and equations. The MDH toxicokinetic model cannot be used.

Thank you and any questions?

This document will be available at
www.michigan.gov/pfasresponse

Science Advisory Workgroup

Kory Groetsch, Director
Environment Health Division
Michigan Department of Health and Human Service

Governor Whitmer Press Release Quotes

March 26, 2019

- “All Michiganders deserve to know that we are prioritizing their health and are working every day to protect the water that is coming out of their taps.”

- “Today I'm directing the Michigan PFAS Action Response Team to form a science advisory workgroup to review both existing and proposed health-based drinking water standards from around the nation to inform the rulemaking process for appropriate Maximum Contaminant Levels (MCL) for Michigan by no later than July 1, 2019.”

Science Advisory Workgroup

- Recommend Health-based Values for PFAS in Drinking Water (aka – HBV being protective of the public health)
- External Experts in Toxicology, Epidemiology, and Risk Assessment
- Request that MPART Chair be empowered to finalize the Science Advisory Workgroup in consultation with MPART Departments

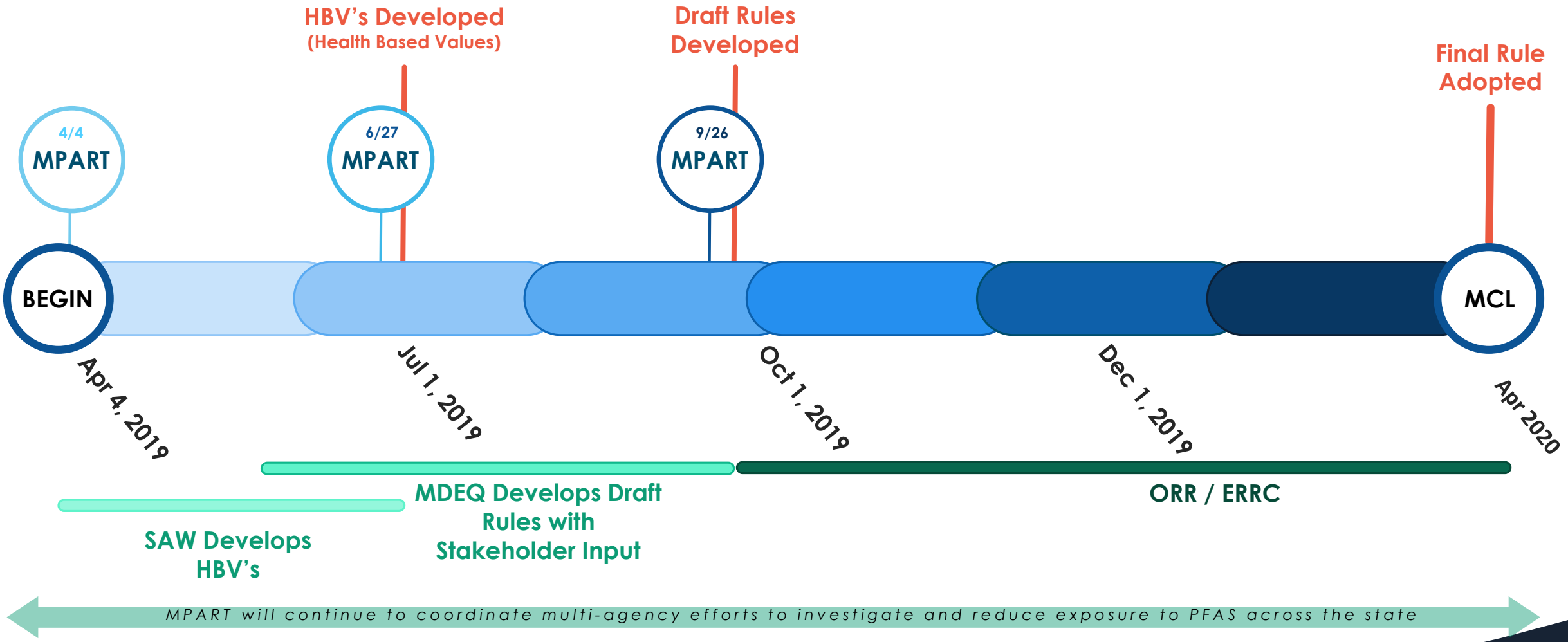
Science Advisory Workgroup
MPART Staffing Support

- MDEQ and MDHHS will provide staffing assistance to the Science Advisory Workgroup by:
  - Conducting a one or two day workshop
  - Responding to information requests
  - Facilitating communication of questions to experts, upon their request
  - Assisting with process, upon their request
  - Respond to other technical requests

Scientific Advisory Workgroup Charge

1. Review existing PFAS non-cancer or cancer-based public health toxicity values for PFAS listed in US EPA Method 537.1 and provide selection justification.
2. Review exposure assessment and risk evaluation methodology for all existing national- and state-derived PFAS drinking water values.
3. Identify the combination of toxicity values and methodology for the calculation of each PFAS HBV.
4. Provide to MPART no later than July 1, 2019 a report recommending each calculated PFAS HBV with written justification of the selected methodology and each selected input.

Overview of MCL Process



Voting Request

- Vote on the Charge
- Empower the MPART Chair to select Science Advisory Workgroup members in consultation with MPART Departments