



**Michigan Department of Health and Human Services (MDHHS)**

Per- and Polyfluoroalkyl Substances (PFAS) Readiness Plan  
*Emergency Operations Plan Annex 3 – Appendix 4*

Not for Dissemination

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## Plan Distribution List

| Plan Holders  |
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| Michigan Department of Health and Human Services (MDHHS) Director   |
| MDHHS Chief Deputy Director   |
| MDHHS Senior Deputy Director  |
| MDHHS Chief Medical Executive   |
| MDHHS Bureau of EMS, Trauma, and Preparedness (BETP) Director   |
| MDHHS BETP Division of Emergency Preparedness and Response (DEPR) Director  |
| MDHHS Emergency Management Coordinators (EMC)   |
| MDHHS BETP Division of EMS and Trauma (DET) Director  |
| Michigan State Police (MSP) Emergency Management and Homeland Security Division (EMHSD) Director  |
| Michigan State Emergency Operations Center (SEOC)   |
| MDHHS Bureau of Epidemiology and Population Health (BEPH) Director  |
| MDHHS BEPH Environmental Health Director  |
| Michigan Department of Environmental Quality (MDEQ) Director  |
| MDEQ EMC  |
| Michigan Department of Agriculture and Rural Development (MDARD) Director   |
| MDARD EMC   |
| Michigan PFAS Action Response Team (MPART)  |
| Michigan Department of Natural Resources (MDNR) Director  |
| MDNR EMC  |
| <i>Electronic versions are maintained on BETP Shared Drive and Michigan Health Alert Network within the MDHHS Emergency Operations Plan (EOP)</i> |

## **Plan Organization**

The Michigan PFAS Readiness Plan follows the emergency management guidelines and responsibilities set forth in the existing Michigan Emergency Management Plan (MEMP) and chain of command structure. The PFAS Readiness Plan is an appendix within Annex 3 of the Michigan Department of Health and Human Services (MDHHS) Emergency Operations Plan (EOP). The Community Health Emergency Coordination Center (CHECC) Operating Procedures Manual also provides supporting documentation for this plan. This plan contains an introduction section and a Concept of Operations implementing a five-phased approach including: Monitoring, Detection, Investigation, Intervention, and Recovery.

## **Plan Maintenance**

The PFAS Readiness Plan has been developed in coordination with local, state, regional, and federal partners and is continually updated and revised as situations change and new information and resources become available. The PFAS Readiness Plan is, at a minimum, to be reviewed and updated annually. The review and update of the plan incorporates any changes reflective of existing guidance, lessons learned from real world incidents or exercises, and changes in policies and procedures.

All plan holders receive revisions and updates as they are published and are given the opportunity to review and provide comments. Authority for review and acceptance of this plan resides with MDHHS.

## Introduction

### Purpose

The PFAS Readiness Plan serves to inform local, state, and federal governments; relevant agencies and organizations, and other stakeholders of the preparedness and response plans specific to PFAS within the Michigan municipal drinking water.

### Scope

This plan describes the operational intent for responding to PFAS contamination detections. The PFAS Readiness Plan details the system that has been developed for operations within Michigan before, during, or after a PFAS detection in municipal drinking water.

### Situation Overview

Groundwater is tested at locations throughout the state by various parties, in order to ensure safety, compliance with regulations, and to proactively detect and remedy potential hazardous situations. In 2010, the Michigan Department of Environmental Quality (MDEQ) discovered levels of Per- and polyfluoroalkyl substances (PFAS) in groundwater monitoring wells at the former Wurtsmith Air Force Base in the County of Oscoda, MI. PFAS are a group of chemicals that include Perfluorooctanoic acid (PFOA), Perfluorooctanesulfonic acid (PFOS), as well as other chemicals. As additional information became available from other national testing that was conducted, Michigan expanded its investigations into other locations where PFAS compounds were potentially used.

In 2018, the MDEQ's Remediation and Redevelopment Division (RRD) established clean-up criteria for groundwater used as drinking water of 70 parts per trillion (ppt) of PFOA and PFOS, individually or combined. The RRD staff are responsible for enforcing these criteria as part of their ongoing efforts to clean-up sites of environmental contamination. The RRD staff are the lead investigators at most of the PFAS sites and also conduct interim response activities. Most of the groundwater sampling at PFAS sites under RRD's lead is conducted by contractors familiar with PFAS sampling techniques. The RRD also has a Geologic Services Unit (GSU), with staff who install monitoring wells and are knowledgeable on PFAS sampling techniques.<sup>1</sup>

The MDEQ has been conducting environmental clean-up of regulated contaminants for decades. Due to the evolving nature of PFAS regulations as new science becomes available, the RRD is evaluating the need for regular PFAS sampling at particular sites and is including an evaluation of PFAS sampling needs as part of a Baseline Environmental Assessment (BEA) review.

The MDEQ is proactively testing public water supplies for PFAS. The MDHHS Division of Environmental Health (DEH) conducts public health assessments, based on the data collected by MDEQ and other agencies, to determine if environmental public health hazards exist from human contact with PFAS containing environmental media (e.g., air, water, soil, and/or food). MDHHS DEH also conducts exposure assessments which may include blood testing; as well as conduct community engagement and health education to convey testing results. MDHHS DEH provides toxicologists, epidemiologists, and health educators to conduct this work. If MDEQ or MDHHS determines that a municipal drinking water

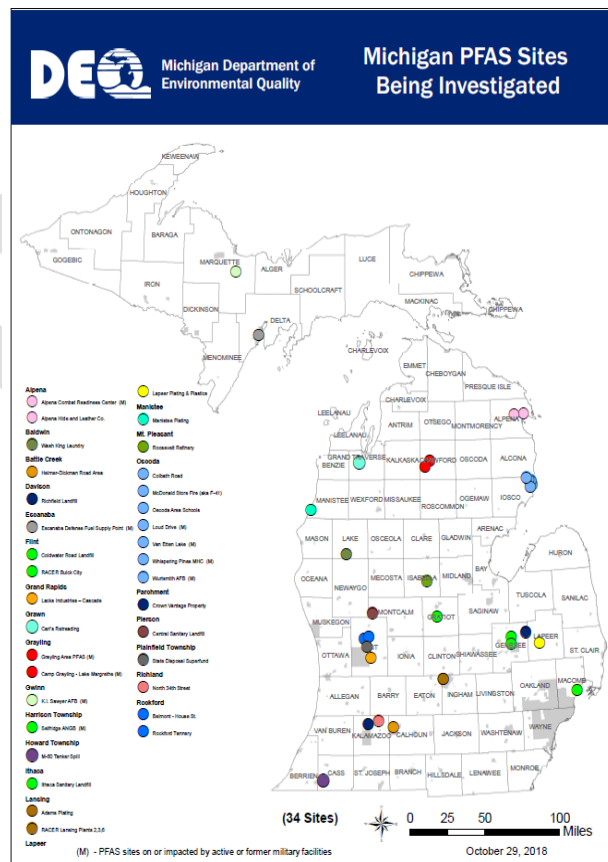
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<sup>1</sup> MDEQ Groundwater Clean-up Criteria – <https://bit.ly/2RCfrhx>

system is not suitable for consumption due to PFAS contamination, local governments will need to evaluate alternatives in order to restore the water quality in the public water system, and to ensure that residents have access to uncontaminated drinking water until that time.

Currently, most samples are shipped to one of the few labs in the country that conduct PFAS analysis, in California; although private labs in other parts of the country, including Michigan, are working to offer these services. The MDHHS and MDEQ have improved or are working toward improving their laboratory analysis capabilities. In 2012, MDHHS Analytical Chemistry Lab was testing fish fillets for 13 PFAS. In 2017, MDHHS Division of Environmental Health and Analytical Chemistry Lab purchased the necessary lab equipment in order to be able to test for PFAS in blood, urine, food, fish, and wild game. In 2018, MDHHS Analytical Chemistry Lab repurposed the PFAS lab equipment and established standard operating procedures to be able to test water and assist MDEQ. Also, in 2018, the RRD purchased lab equipment that will allow the MDEQ Environmental Lab to conduct analyses of certain PFAS samples. As of August 2018, RRD has hired additional staff to develop the methodology and conduct PFAS analyses.

The map below displays sites where the MDEQ has confirmed detections of PFOA and PFOS in groundwater, as of October 2018. A routinely updated map and schedule for ongoing statewide testing are available on the MDEQ website: <https://www.michigan.gov/pfasresponse>



## **Risk Communications**

In the event of a public health hazard for PFAS in municipal drinking water, MDHHS may activate the MDHHS Emergency Operations Plan's Annex 05: Crisis and Emergency Risk Communication Plan (CERC). The CERC Plan outlines an all-hazard communication model designed to capture broad elements of a public information response. The plan outlines how MDHHS would develop messages, coordinate outreach, and disseminate information to the public, response partners, and stakeholders. The CERC plan and all appendices are stored on Michigan Health Alert Network (MIHAN) (*path: Documents/Michigan Agencies/MDHHS/EOP/Annex 05\_Crisis\_Emergency Risk Comm Plan*).

MDHHS Communications Office's Public Information Officers (PIO) shall work with subject matter experts (SMEs) within state agencies, as well as with local partners, to respond to requests for information and materials, update applicable website(s), facilitate coordination of conference calls and maintain situational awareness, as appropriate.

## **Public Messaging**

Upon receiving a municipal water sampling schedule, the local Emergency Manager, Local Health Department (LHD), Public Works agency, water system operator, and appropriate public officials should work together to initiate strategies for public communications as needed, to include determining who will serve as the local PIO(s) providing messaging to the community. Depending on the situation, they also should consider if establishing a Joint Information Center (JIC) is warranted.<sup>2</sup>

## **Pre-test Messaging**

Local PIO(s) should work with the LHD to determine how to communicate that sampling is occurring in the community. This notification should also include a description of PFAS, the health advisory messaging provided by MDHHS, potential health risks of PFAS, and how and when sampling results will be made available.

## **Messaging if a Public Health Hazard is Identified**

If PFAS levels are determined to be a public health hazard, the local PIO(s) should reach-out to the PIOs from the MDEQ and MDHHS for assistance on environmental investigation and public health messaging, respectively.

MDHHS and MDEQ have developed sample letters, as well as a notification protocol that can be utilized by the local jurisdiction for providing notifications to the public regarding drinking water sampling results.

*See Attachments 1.1, 1.2, 1.3, 1.4, and 1.5 for Sample PFAS Results Letters.  
See Attachment 2 for PFAS Sampling and Notification Protocol.*

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<sup>2</sup> Joint information center is a facility established to arrange all incident-related public information activities. It serves as the physical location where public information officials can locate to perform critical emergency information, crisis communications, and public affairs functions. Therefore, all public information officials should locate at the joint information center. It is the central point of contact for all news media at the scene of the incident. JICs may be established at various levels of government or at incident sites or can be components of Multiagency Coordination Systems. (<https://definitions.uslegal.com/j/joint-information-center-jic/>)



The local PIO(s) may also consider:

- Holding local press conferences and/or town hall meetings.
- Coordinating with the Governor's Office, MDEQ, MDHHS, and other state agencies as necessary to create fact sheets, Frequently Asked Questions (FAQ), and talking points, in order to answer media/public inquiries.
- Establishing a public inquiry hotline.
- Ensuring public information is available to non-English speakers and Access and Functional Needs (AFN) populations (e.g., news releases being made available in alternate languages, sign-language interpreters at press conferences and town hall meetings, and etc.).<sup>3</sup>

Additional Risk Communication Resources are available on the PFAS Response Website:

<https://www.michigan.gov/pfasresponse>.

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<sup>3</sup> FEMA Access and Functional Needs Fact Sheets - <https://www.fema.gov/media-library/assets/documents/94708>

## Concept of Operations

This Concept of Operations creates a framework for the direction, control, and coordination of activities for this PFAS Readiness Plan. It is not the intent of this plan to circumvent or modify existing mechanisms, organizational or operational structures as specified within the Michigan Public Act 390, the Michigan Emergency Management Plan (MEMP), and/or the National Incident Management System (NIMS). Accordingly, the following sections provide key information and recommendations for operationalizing timely and effective procedures for investigation of potential sources, initiating timely and effective response measures, and ensuring transparency while keeping the public informed.

In the event that a hazardous PFAS level is detected in a municipal water supply, it is the responsibility of the municipality to respond to the fullest extent possible. If MDHHS determines that there is a public health hazard, the LHD can issue a, “Do Not Drink” water advisory. Affected municipalities will be responsible to restore water quality in the municipal water system and provide alternate potable drinking water to residents until the, “Do Not Drink” water advisory is lifted by the LHD.

### Planning Assumptions

The following assumptions pertain to the laboratory testing, notification, surveillance, and remediation of PFAS in municipal water systems within the state and serve to guide public health and emergency management response planning:

- Chemical compounds included in the total PFAS calculation may change.
- New research will assist in the understanding of PFAS, as well as human and environmental implications.
- If the EPA or the state changes the standards that pre-empts the detection limits described within this plan, the processes and procedures will remain the same in alignment with those changes.
- The number of PFAS contaminated sites in Michigan will increase.
- Water systems with detections of PFAS that are not determined to be a hazard may be placed on a monitoring program, where they will periodically need to be sampled and tested for PFAS.
- MDHHS will support the LHD response by providing technical assistance, to include, but not limited to: toxicology, epidemiology, community engagement, and health education.
- MDHHS will follow NIMS and its approved EOP policies and procedures in concert with the Michigan State Police (MSP) Emergency Management and Homeland Security Division (EMHSD), the State Emergency Operations Center (SEOC), if activated, and other agencies, as appropriate.<sup>4</sup>
- Drilling new ground water wells may be prohibited if the source of PFAS contamination could exacerbate the spread of PFAS contamination vertically or horizontally.
- MPART, to include the Governor’s office, will coordinate among local, state, and federal agencies charged with identifying, communicating, and addressing the potential effects of PFAS in Michigan and protecting public health.<sup>5</sup>

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<sup>4</sup> Michigan Emergency Management Plan - [https://www.michigan.gov/documents/msp/MEMP\\_portfolio\\_for\\_web\\_383520\\_7.pdf](https://www.michigan.gov/documents/msp/MEMP_portfolio_for_web_383520_7.pdf)

<sup>5</sup> Executive Directive 2017-4 - [https://www.michigan.gov/snyder/0,4668,7-277-57577\\_57657-452191--,00.html](https://www.michigan.gov/snyder/0,4668,7-277-57577_57657-452191--,00.html)

## Roles and Responsibilities

The agencies listed below are responsible for overseeing and implementing the PFAS Readiness Plan. Specific responsibilities for supporting this PFAS Readiness Plan are consistent with the provisions contained within the MEMP for coordinating health and environmental assistance during an incident involving chemical contamination.

- Federal Level Responsibilities
  - The US Department of Health and Human Services (DHHS) may provide technical assistance for state and local public health.
  - The Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR) may provide technical assistance, when requested.
  - US Department of Agriculture (USDA) and the Federal Drug Administration (FDA) may coordinate with the state on testing and development of standards.
  - US Environmental Protection Agency (EPA) may provide guidance and technical assistance upon request and establish the regulatory drinking water value.
- State Level Responsibilities
  - MDHHS will:
    - Operate under the public health code (Act 368 of 1978) to conduct environmental public health assessments, determination of public health hazards, and issuing public advisories and recommendations.<sup>6</sup>
    - Provide toxicological epidemiologic, analytical, and health education subject matter expertise to local and state partners.
    - Ensure MDHHS PIO coordination with the local Incident Command (IC), the Michigan Department of Agriculture and Rural Development (MDARD), and MDEQ to provide consistent, timely and accurate information to the public.
    - Epidemiologists will monitor surveillance systems and work with local health departments to monitor health outcomes.
    - Bureau of Laboratories (BOL) will assist with analytical methods and overflow sample testing, using isotope dilution methods, as well as expediting sample analysis.
  - MDEQ will:
    - Operate under Michigan's Safe Drinking Water Act (399 of 1976)<sup>7</sup>
    - Coordinate the initial statewide sampling of community drinking water supplies through a contract service.
    - Verify/review testing data upon delivery from contracted laboratories and send the results to MDHHS DEH, Toxicology and Response Section, Drinking Water Unit.
    - Consult with EPA when needed and/or requested.

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<sup>6</sup> Michigan Public Health Code (Act 368 of 1978) - <http://www.legislature.mi.gov/documents/mcl/pdf/mcl-act-368-of-1978.pdf>

<sup>7</sup> Michigan Safe Drinking Water Act (399 of 1976) - [https://www.michigan.gov/documents/deq/deq-wb-dwehs-cws-Act399\\_247583\\_7.pdf](https://www.michigan.gov/documents/deq/deq-wb-dwehs-cws-Act399_247583_7.pdf)

- Determine the PFAS testing schedule, sampling plan, and reporting requirements within the RRD-led environmental investigation areas. MDHHS will then review the sampling plan to ensure alignment with public health investigation objectives
  - Conduct sampling of all municipal drinking water systems and select wells in schools, licensed daycares, and other sensitive populations based on typing (i.e., type II wells<sup>8</sup>).
  - Provide recommended actions to Water Treatment Operators regarding PFAS through the Drinking Water and Municipal Assistance Division (DWMAD).
  - Provide all testing results for municipal water supplies to the public.
- All state agencies will:
  - Report data and information to MPART, to include the Governor's office, as it becomes available.
  - Utilize the established PFAS Environmental Public Health Response Protocol
- Local Health Department Responsibilities:
  - In collaboration with local emergency management, implement investigation and intervention measures with the impacted community, including but not limited to: public health advisories, education, and ensuring alternate sources for water.
  - Will have the first opportunity to implement actions under the public health code.
  - Maintain situational awareness with state agencies.
  - Maintain communication between healthcare, law enforcement, and municipalities, and will assist with the coordination of public health actions.
  - Provide situational awareness to their LEOC and partners, as appropriate.
  - Provide risk communications to the media and the public as necessary.
  - Work with MDHHS and MDEQ to develop a Public Health Action Plan for detection of PFAS in private wells.

*See Attachment 3 for the PFAS Environmental Public Health Response Protocol.*

*See Attachment 4 for the Public Health Action Plan Template.*

### **Reporting Essential Elements of Information (EEI)**

The essential elements of information that must be reported to public health in order to facilitate a timely and proper response, include:

- All individuals identified as at-risk for having exposure to hazardous levels of PFAS.
- All individuals confirmed with exposure to hazardous levels of PFAS.
- Wells containing hazardous levels of PFAS.

The MDEQ has primary enforcement authority in Michigan for the Federal Safe Drinking Water Act under the legislative authority of the Michigan Safe Drinking Water Act, both of which

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<sup>8</sup> Michigan Water Well Manual - [https://www.michigan.gov/documents/deq/Water\\_Well\\_Manual\\_2013\\_437334\\_7.pdf](https://www.michigan.gov/documents/deq/Water_Well_Manual_2013_437334_7.pdf)

protect public drinking water supplies in Michigan and across the United States. The United States Environmental Protection Agency has issued a health advisory for PFAS, which serves as guidance for federal, state, and local officials dealing with PFAS in drinking water. Executive Order 1996-1 transferred responsibilities for environmental health programs related to drinking water from the Department of Public Health to the MDEQ. The MDHHS continues to address the impacts of natural and manmade environmental hazards on human health via its Division of Environmental Health, which often has interaction with the MDEQ on issues related to PFAS. However, regulatory oversight of PFAS in drinking water begins with the MDEQ, which administers several state and federal statutes governing environmental contaminants in water resources.

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## Phased Approach

### Monitoring

The State of Michigan is working proactively to test and oversee the monitoring of PFAS in municipal and select Type II wells.

The local Emergency Manager (EM) is responsible for the affected municipality. The local health department, the municipal Public Works agency, and other municipal officials, such as the City Manager or Township Supervisor, should meet to discuss the PFAS water testing before the testing begins, or test results are received. Collectively, this group should discuss potential strategies to address PFAS contamination in municipal water, should PFAS water results identify a public health hazard.

To prepare for a potential PFAS municipal water intervention, the local EM should work with stakeholders to consider immediately taking the following steps:

- Work with the Public Works agency, and/or agency operating the water system, to review and update contingency plans in the event of contamination of the system.
- The operator should evaluate alternatives for restoration of the water quality in the system with the MDEQ DWMAD, based on technical and regulatory viability.
- Begin weighing alternative options for ensuring the access to drinking water for residents, should a, “Do Not Drink Water” public health advisory be issued.
- Review the records of all homes and facilities that are connected to the public water system; all homes, public facilities (e.g., schools, government buildings, and etc.) and licensed facilities (e.g., day cares, adult foster care, and etc.) that are utilizing private wells or other private water sources, and the location of lead and copper service lines.

Municipalities may choose to start stockpiling water in anticipation of POD operations. Municipal water systems could use filtration technology to remove PFAS from the municipal water. Efficacy of the filtration technology will be demonstrated by periodic PFAS water testing of post filtered water.

In addition, there are treatment options available for residents who are concerned about their drinking water. In-home water filtration systems are recommended to lower the levels of PFAS in drinking water.

If residents express concerns regarding testing and/or treatment of PFAS, they may contact the local health department, or call the MDEQ Environmental Assistance Center at 1-800-662-9278.

*See Attachment 5 for the PWS School Process for Evaluating Requests for Interim Water.*

## Detection

The Public Works agency of the municipality being tested should verify if it is possible to connect the municipality's water system to that of a neighboring jurisdiction. They can contact neighboring municipalities to determine if their water has already been tested and discuss measures necessary to connect the two water systems, if needed. Discussion may include the following topics:

- Where the two systems could connect.
- How long it would take for these systems to be connected.
- Pre-testing of water in each system, in order to determine if the water composition is compatible or if alterations would be necessary.
- Procedures for determining that water after the connection is made complies with state and federal Safe Drinking Water Act rules and requirements.<sup>9</sup>

MDHHS, in collaboration with other state agencies have developed a reporting template, decision making framework, and deliverables document to assist local partners in responding to a detection of hazardous levels of PFAS.

*See Attachment 6 for the PFAS Response Reporting Template.*

*See Attachment 7 for Decision Framework for PFAS in Residential Wells.*

*See Attachment 8 for the Immediate Response to PFAS Deliverables Document.*

*See Attachment 9 Local Emergency Management Considerations Checklist.*

## Investigation

Municipal officials should weigh alternatives for how water will be made available to residents should a, "Do Not Drink" water advisory be issued by the LHD. Alternatives may include:

- Residents may purchase bottled water or filters at stores.
- The municipality may provide bottled water to residents at one or more Points of Distributions (PODs).
- Provide point-of-use filters to residents on private residential wells, that are NSF-certified to remove applicable contaminants from drinking water (point-of-use filters are not to be used for municipal water systems).

Municipal officials should also determine which homes are on the municipal water system, and which homes are utilizing private wells or other private water sources (to be determined by address).

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<sup>9</sup>EPA Safe Drinking Water Act - <https://www.epa.gov/sdwa>

## **Intervention**

Should MDHHS determine that the water could pose a public health hazard, the LHD can issue a, “Do Not Drink Water” public health advisory to ensure the health and safety of residents on the water system.

Determinant upon the length of time that it will take to restore the water system, the demographic and economic makeup of the affected population, and other considerations, municipalities may deem it necessary to ensure access to clean water by distributing bottled water or filters to residents. If water distribution operations become necessary, the local stakeholders will determine if a POD, door-to-door delivery, or another system of water delivery is needed, and how long that distribution option will be used. A combination of methods may also be considered.

The World Health Organization (WHO) suggests that 7.5 liters of water per capita/per day will meet the needs of most people, under most conditions. Previously, other municipalities affected by PFAS contaminations in the State of Michigan have distributed two 24-bottle cases of water (12 liters) per day/per household or one 40-bottle (20 liters) case of water per day/per household. These benchmarks may help LHDs to determine how many cases of water are necessary for distribution to their population.

### **Food Establishments**

When a water system is unfit for consumption, in addition to notifying the public, the food industry will also be impacted. Food processors, grocery and convenience stores, restaurants and other businesses that make and handle food will not be able to use that water to process, cook, or package food, make ice, dispense soda, make coffee, and other activities. With PFAS in the water, they can still use it for washing pots, pans, utensils, and etc., but it should not be used for washing food. MDARD and LHD inspectors will reach-out to the impacted licensed businesses and provide assistance and recommendations for alternative water supplies and possible license limitations, as well as disposal of food products that should not be consumed.

### **Points of Distribution (PODs)**

Local stakeholders may determine that the distribution of bottled water (and other applicable commodities, such as filters) at PODs is the best option to ensure that residents have access to uncontaminated water.

PODs should be located in well-known locations with smooth traffic flow and should be well advertised. POD layout and operating hours should depend on the size and the demographics of the community. To avoid abuse of the availability of free commodities, it is recommended that POD operations include validating individuals' addresses, or conducting another form of an identity check, in order to access available resources.

For further information on POD operations, refer to FEMA IS-26: “Guide to Point of Distribution<sup>10</sup>.”

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<sup>10</sup> FEMA IS-26 - <https://training.fema.gov/is/courseoverview.aspx?code=IS-26>



## **Recycling**

If a municipality decides to provide bottled water to residents, there may be a need for additional recycling options. Local officials and private recycling or waste providers should collaborate on a recycling plan to handle the additional recyclable material. Alternatives to address the additional accumulation of plastic waste may include additional curbside recycling pickups, or options for residents to return empty bottles to POD sites.

## **Door-to-door Distribution**

A distribution plan for items that will not be handed-out at PODs, or for individuals who are unable to make it to POD locations, may be necessary in order to ensure that all residents receive necessary commodities. Ideally, the municipality should establish a list of all addresses that require delivery (for example, to residents with access and functional needs, who cannot reach a POD or transport larger quantities of water). It will be necessary to contact those affected households and inform them of delivery options and times.

Any time that commodities are delivered to residents, a tracking system should be used for deliveries, inventories, and product type. Practices may include having the resident sign a piece of paper with the date, time, and item/service they received that is then collected by POD staff.

## **Filters**

A municipality may choose to provide NSF International point-of-use filter systems to residents on private residential wells, in order to access clean water in their homes. They can be provided at PODs and by door-to-door distribution. If certified point-of-use filter systems are distributed, proper installation, use, and maintenance of filters will be necessary. If only non-certified filters are available for use, post filter testing of PFAS will need to occur in order to determine that the water is not a public health hazard.<sup>11</sup>

To ensure that PFAS filter systems that are selected sufficiently address the PFAS identified during water sampling, this selection of filters should be discussed with MDHHS toxicologists, MDEQ DMWAD, as well as the MDHHS DEH Drinking Water Unit. The link referenced in the footnote below provides additional information in order to help identify filters that are appropriate for the specific contaminants.

## **Purchasing Water and Filters**

Local stakeholders should determine purchasing procedures, options, and funding sources for commodities such as bottled water and filters. The extended purchasing program MiDEAL, allows local units of governments to use state contracts to buy goods and services, and is a potential source for commodity purchases.

Due to the high costs of response efforts, it is important to implement commodity labor cost tracking mechanisms to prevent fraud.

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<sup>11</sup> NSF International - [www.nsf.org/consumerresources/water-quality/water-filters-testing-treatment/contaminant-reduction-claims-guide](http://www.nsf.org/consumerresources/water-quality/water-filters-testing-treatment/contaminant-reduction-claims-guide)

*See Attachments 10, 11, and 12 for information regarding state contracts and procedures for purchasing commodities and tracking response-related costs.*

### **Volunteer and Donations Management**

The local emergency manager should review local volunteer and donations management plans and solicit input from the LHD and volunteer organizations. Potential stakeholders that may provide volunteers, donations, and support for volunteer and/or donations management may include:

- American Red Cross
- Citizen Emergency Response Team (CERT)
- Medical Reserve Corps (MRC)
- Salvation Army
- Michigan Community Service Commission (MCSC)
- United Way (UW)
- Local faith-based groups
- Community groups
- Businesses
- Sports teams

A Volunteer Reception Center (VRC) may be necessary in order to coordinate volunteer resources. Affiliated volunteers with recognized organizations such as the American Red Cross and Salvation Army will most likely reach-out to the local EM and LHD to offer targeted services.

Volunteers may support POD operations, manage donations, make door-to-door visits with information and/or commodities, and assist with recycling efforts. It is important to contact voluntary organizations early, and to have an organized system in place to ensure that volunteers are used most effectively. Ultimately, the safety of volunteers must be assured, and a safety plan should be prepared and implemented.<sup>12</sup>

Donations received by local stakeholders may be in-kind, value-added, or unsolicited goods. All items that are donated should be processed through a Donations Intake and Processing Center (DIPC), where items that are useful for this incident can be processed and distributed as needed. Items that are not useful to this incident may be routed to more appropriate facilities.<sup>13</sup>

### **Recovery**

In addition to response actions for ensuring that residents have access to drinking water, after elevated PFAS levels have been found, it will be necessary for the municipality to take actions to restore water quality, in order to fully recover from the contamination. Local officials will determine which actions are the most appropriate for their community for restoring their water system.

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<sup>12</sup>Occupational Safety and Health Administration (OSHA) Checklist for Voluntary and Community-Based Organizations - [https://www.osha.gov/dts/oohn/disasterrecovery\\_shchecklist.html](https://www.osha.gov/dts/oohn/disasterrecovery_shchecklist.html)

<sup>13</sup> Michigan Local Disaster Logistics and Donations Management Planning Handbook - [https://www.michigan.gov/documents/msp/local\\_disaster\\_logistics\\_and\\_donations\\_management\\_planning\\_handbook\\_-\\_pub\\_107a\\_-\\_stakeholder\\_review\\_draft\\_sept\\_396838\\_7.pdf](https://www.michigan.gov/documents/msp/local_disaster_logistics_and_donations_management_planning_handbook_-_pub_107a_-_stakeholder_review_draft_sept_396838_7.pdf)

The local Public Works agency and water system operator should identify the appropriate mechanisms to most efficiently restore their community's water system. These actions should be coordinated with the local municipality and MDEQ DWMAD, in order to ensure that they are technically viable and in compliance with all applicable regulations options may include:

- Interconnecting the water system with an adjacent water supply while the system flushed;
- Installing new municipal wells; and
- Treating the water at the source, or at the treatment plant.

### **Interconnection to Adjacent Water Supply and Flushing of the Water System**

In some cases, the municipality may have access to an emergency interconnection with an adjacent water supply. The local Public Works agency, in conjunction with the local emergency management and MDEQ, will determine if connecting to another water system is the most effective way in which to remove PFAS contaminants from the current water system. MDHHS and the LHD will evaluate PFAS water testing results to determine if the public health hazard has been eliminated. Flushing should only be done after a thorough assessment of the system, and the alternate water source, have been completed. Items to consider include:

- Does the adjacent water supply have sufficient capacity to supply water?
- Does the adjacent water supply have PFAS levels that have been evaluated by MDHHS DEH and a determination has been made that the dataset is representative and does not include a public health hazard?
- Engineering considerations of the interconnection (discuss the change of water source with MDEQ Peer Review Team). MDEQ permits may be necessary.
- Address potential for backflow prior to making a connection between systems.
- Analyze the relative water chemistry of two sources, including all water quality parameters (WQPs), orthophosphate and total phosphate residuals, etc.<sup>14</sup>
- Develop a sampling plan to determine the impact of the source water change, including lead & copper, bacti, WQPs, PFAS, and etc. Samples should be taken before and after the interconnection, if possible and per the direction of the MDEQ.
- Develop a system-wide unidirectional flushing plan. In doing so, consider the consequences surrounding the removal of the sediments and tuberculation within the distribution systems of both the receiving and donor systems (the donor system will undergo an increase in flow rates, which may pick-up sediments and break loose tuberculation).
- Mitigate and maintain control of the pressure differentials between the two distribution systems.
- Discuss with MDEQ Water Resources Division water discharge location(s). Water containing elevated PFAS levels should be captured or directed to a sanitary sewer, if possible, in order to minimize concerns regarding surface water contamination. It is necessary that the receiving wastewater treatment facilities are prepared to mitigate the higher levels of PFAS (conventional treatment does not remove PFAS).

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<sup>14</sup> Michigan Water Quality Parameters - [https://www.michigan.gov/deq/0,4561,7-135-3313\\_71618\\_3682\\_3713-10416--,00.html](https://www.michigan.gov/deq/0,4561,7-135-3313_71618_3682_3713-10416--,00.html)

- Develop and distribute household flushing plans, once the system has been purged of water above PFAS standards.<sup>15</sup> Aerators must be cleaned in order to ensure that particulates have not accumulated. Special considerations should be made for older households with galvanized or lead plumbing, or older brass fixtures.

### **Install New Municipal Wells**

After discussions with the MDEQ DWMAD and local units of government, the economical solution may result in the need to establish a new municipal water source with new wells. The local municipalities shall discuss the location of PFAS contamination with MDEQ RRD, or the EPA, in order to ensure that the new wells will not exacerbate the spread of PFAS environmental contamination. These wells may be deeper or in a new location. The ultimate decision on the path forward would be based on science and engineering standards. This would be considered a new source, and all of the above considerations would apply, when transitioning over to a new water source.

### **Treat Water at Source or at Treatment Plant**

After discussions with the MDEQ MWMDA and local units of government, the economical solution may be to complete modifications to the existing water treatment process by introducing granular activated carbon (GAC) filtration, synthetic resin, or other treatment technologies to the municipal water system. All of the above considerations would also apply, when transitioning over to a new treatment technology.

### **Exposure Assessment**

An Exposure Assessment will be conducted in order to assess the community's exposure to PFAS from contaminated drinking water. It will recruit individuals from an exposed community (that are already known to have elevated levels of PFAS reported). Water and blood tests will be conducted to establish the association between the suspected source, to the blood level in a person, along with a survey by the person that will assess other potential exposures they may have had to PFAS in their environment.

The data from the survey, water PFAS information, and serum PFAS levels from the targeted community exposure assessment will develop the best predictive multivariate model of serum PFAS levels. This model will assist in the prediction of serum PFAS levels for individuals who have water PFAS measurements but have not had their blood tested. A comparison of the serum levels to the current national PFAS serum averages will allow for an indication as to the extent of which the exposure from the affected drinking water in a community may contributed to community blood levels above that national average.

### **Health Study**

An epidemiologic study may include a comparison group, an expanded health effects questionnaire, additional laboratory data relating to potential health effects and, and a potential review of impacted individuals' medical records; however, biomonitoring results from the community exposure assessment may be compared to biomonitoring results in exposure/health effects studies conducted in other populations.

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<sup>15</sup> Michigan Water Well Disinfection Manual (instructions for flushing) - [https://www.michigan.gov/documents/deq/deq-wb-dwehs-wcu-disinfectmanual\\_221334\\_7.pdf](https://www.michigan.gov/documents/deq/deq-wb-dwehs-wcu-disinfectmanual_221334_7.pdf)

*See Attachment 13 - PFAS Exposure Assessment Technical Tools (PEATT)*

During recovery, the MDEQ will continue to provide site investigation, technical assistance, and remediation as needed, by conducting the following activities:

- Oversee and provide site investigation and enforcement for locations where elevated PFAS is identified.
- Provide technical expertise for protecting municipal water system customers and infrastructure from elevated PFAS levels.
- Provide guidance, reviews, and approvals for compliance with drinking water regulations
- Provide technical guidance on proper disposal of PFAS containing items.
- Assist as necessary with the sampling and laboratory analysis of municipal water system samples for PFAS and other water quality parameters during the immediate recovery phase.

### **Demobilization**

The local EM should work with local stakeholders to establish clear goals and measurable objectives for recovery and demobilization before the deployment of any resources. This will allow them to manage public expectations (for example, the duration for which residents will be provided with water), and to inform their own decision making regarding the demobilization of resources (such as the duration for PODs to remain open and operational). Stakeholders should also consider how to return a resource to its owner or worksite, if maintenance will be necessary before it is returned, and how applicable reimbursements will be handled.

## Resources and Links

(A listing of all acronyms can be found in the MDHHS EOP Base Plan)

ATSDR Public Health Assessment Guidance Manual

[https://www.atsdr.cdc.gov/hac/PHAManual/PDFs/PHAGM\\_final1-27-05.pdf](https://www.atsdr.cdc.gov/hac/PHAManual/PDFs/PHAGM_final1-27-05.pdf)

MDEQ Groundwater Clean-up Criteria

[https://www.michigan.gov/documents/deq/deq-rrd-UpdatedGroundwaterCleanupCriteriaTableWithFootnotesPFOSFOA1-25-2017\\_610379\\_7.pdf](https://www.michigan.gov/documents/deq/deq-rrd-UpdatedGroundwaterCleanupCriteriaTableWithFootnotesPFOSFOA1-25-2017_610379_7.pdf)

MDEQ In-Home Filtration System Information

[https://www.michigan.gov/documents/deq/deq-dwmad-eh-swpu-FilterFactSheet\\_610096\\_7.pdf](https://www.michigan.gov/documents/deq/deq-dwmad-eh-swpu-FilterFactSheet_610096_7.pdf)

MDEQ Safe Drinking Water Website

<https://www.michigan.gov/deq>

Michigan Local Disaster Logistics and Donations Management Planning Handbook

[https://www.michigan.gov/documents/msp/local\\_disaster\\_logistics\\_and\\_donations\\_management\\_planning\\_handbook\\_-\\_pub\\_107a\\_-\\_stakeholder\\_review\\_draft\\_sept\\_396838\\_7.pdf](https://www.michigan.gov/documents/msp/local_disaster_logistics_and_donations_management_planning_handbook_-_pub_107a_-_stakeholder_review_draft_sept_396838_7.pdf)

Michigan PFAS Risk Communication Resources

<https://www.michigan.gov/pfasresponse/0,9038,7-365-86509---,00.html>

Michigan Public Health Code

<http://www.legislature.mi.gov/documents/mcl/pdf/mcl-act-368-of-1978.pdf>

Michigan Safe Drinking Water Act

[http://www.legislature.mi.gov/\(S\(ijcchf00cdeqr1clb53tv1xe\)\)/mileg.aspx?page=GetObject&objectname=mcl-Act-399-of-1976](http://www.legislature.mi.gov/(S(ijcchf00cdeqr1clb53tv1xe))/mileg.aspx?page=GetObject&objectname=mcl-Act-399-of-1976)

Michigan Water Quality Parameters

[https://www.michigan.gov/deq/0,4561,7-135-3313\\_71618\\_3682\\_3713-10416--,00.html](https://www.michigan.gov/deq/0,4561,7-135-3313_71618_3682_3713-10416--,00.html)

Michigan Water Well Disinfection Manual (instructions for flushing)

[https://www.michigan.gov/documents/deq/deq-wb-dwehs-wcu-disinfectmanual\\_221334\\_7.pdf](https://www.michigan.gov/documents/deq/deq-wb-dwehs-wcu-disinfectmanual_221334_7.pdf)

Michigan Water Well Manual

[https://www.michigan.gov/documents/deq/Water\\_Well\\_Manual\\_2013\\_437334\\_7.pdf](https://www.michigan.gov/documents/deq/Water_Well_Manual_2013_437334_7.pdf)

MPART Website

<https://www.michigan.gov/pfasresponse>

NSF-Certified Filter Information for PFAS

<http://www.nsf.org/newsroom/nsf-international-certifies-first-water-filters-pfoa>

OSHA Checklist for Voluntary and Community-Based Organizations

[https://www.osha.gov/dts/oohn/disasterrecovery\\_shchecklist.html](https://www.osha.gov/dts/oohn/disasterrecovery_shchecklist.html)