

Addressing PFAS Contamination in the Huron River Watershed

Recommended Practices for Regional Conservation Organizations

Prepared by the Huron River Watershed Council

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Huron
River
Watershed
Council

SUMMARY OF RECOMMENDATIONS FOR REGIONAL CONSERVATION ORGANIZATIONS

Since PFAS emerged as a major contamination issue and threat to the Huron River watershed, the Huron River Watershed Council (HRWC) has learned valuable lessons as we made progress and experienced setbacks addressing this multifaceted problem. The following list of recommendations is intended to help guide local and regional watershed conservation organizations as they tackle the many challenges posed by PFAS contamination.

1. **Engage with existing networks of organizations pursuing PFAS action.** PFAS contamination is a multidimensional challenge. The optimal strategy is to seek out organizations with complementary skill sets, particularly in terms of legal expertise and policy development for state and federal lawmakers. Partner with other local organizations, such as other environmental and human health advocacy groups, to amplify messaging.

2. **Develop strong relationships and share information with local partners within, bordering, or overlapping your region.** Grassroots organizations, municipal officials, and long-time area residents can often provide valuable information not readily available to state officials.

3. **Advocate for robust, coherent engagement from state agencies.** Michigan's MPART offers a strong model for other states. Without a coherent network of alliances to provide an action framework for various state agencies, the rapid response to PFAS in Michigan would not have been possible.

4. **Engage with communities as early as possible regarding specific PFAS contamination issues or specific sites.**

Often, enforcement officials cite fear of alarming residents and the general public as a rationale for delaying action or the release of information. This fear has been unwarranted

in Michigan. While some residents are understandably concerned when they learn they may be exposed to PFAS, the alternative will lead to unrecoverable loss of trust in the community.

5. Pursue watershed-wide investigation strategies for PFAS.

Contamination in one part of the watershed may be linked to effects in another area and may not be immediately apparent.

6. Verify the logic and methodology used by enforcement officials regarding specific PFAS contamination issues.

State agencies are often underfunded, overworked, and their staff are spread thin. It is entirely possible that there may be logical flaws in assessment processes that do not follow best practices or what the science recommends. It is also possible that polluters have made substantial recommendations officials that guide the enforcement of their own cleanup process.

7. Encourage and enforce accountability.

Work with statewide, regional, and federal organizations to advocate for strong laws that place liability on polluters, hold them accountable, and require regulators to enforce strict cleanup and remediation actions.

8. Work closely with reporters and journalists to keep the issue in the public spotlight.

Journalists have skills, tools, and expertise that are often unavailable to environmental organizations. They will often notice details and recognize questions that others will not. Environmental reporters in Michigan associated with many media outlets have been invaluable for uncovering unscrupulous activity from polluters and have helped hold government agencies accountable.

Invite media to community discussion forums, be readily available and prepared for interviews, write op-eds, and pitch stories about new developments.

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1. INTRODUCTION

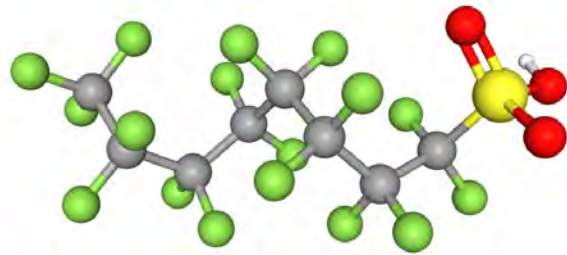
The Huron River watershed, home to more than 650,000 residents, occupies parts of Oakland, Livingston, Ingham, Jackson, Wayne, Monroe, and Washtenaw counties. It encompasses extensive agricultural regions, large contiguous tracts of protected lands, and urban areas.

The watershed population is both ethnically and politically diverse, multicultural and multi-lingual, and includes several majority-minority communities. A large percentage of residents rely on private drinking water wells.

In terms of issues such as chemical contamination, the Huron River watershed is a microcosm of southern Michigan. Contaminants have been found in both surface waters and groundwater supplies.

1.1 About This Document

The Huron River Watershed Council (HRWC) has prepared this document in consultation with local, state, and federal partners as well as academic experts. It covers a range of topics, all intended to provide background on how the emerging PFAS crisis affected the Huron River watershed, what steps HRWC and partner organizations took in responding to the contamination, lessons learned from our successes and failures, and policy recommendations for addressing PFAS contamination. It is our hope that this information will prove useful to practitioners and watershed conservation organizations throughout the country.



The chemical structure of perfluorooctanesulfonic acid (PFOS) a PFAS chemical that contaminates the Huron River. The carbon atoms are indicated by gray spheres. Fluorine atoms are indicated with green. Yellow is sulfur, red is oxygen and white is hydrogen. Most PFAS have a similar structure of a carbon chain with fluorine atoms bound to it.

Overview of PFAS Contamination as an Emerging Threat

1.1 What are PFAS?

Per- and polyfluoroalkyl substances (PFAS) are a large class of extremely toxic synthetic chemicals. Often referred to as “forever chemicals,” they do not readily break down. Instead, they persist in the environment and accumulate in the human body over time. In recent years, and with increasing speed and urgency, scientists have uncovered a wide range of negative health effects linked to chemicals within the PFAS class.

1.2 PFAS Chemical Structure and Long Environmental Half-life

PFAS molecules are composed of a chain of carbon atoms with fluorine atoms bonded along the chain. This carbon-fluorine bond is one of the strongest found these chemicals will not readily degrade in the environment on the scale of human lifetimes, earning PFAS the nickname “forever chemicals.”

These compounds last for so long in the environment that scientists have been unable to accurately estimate the half-life of the vast majority of PFAS.

1.3 A Global Problem

PFAS have been widely used since the middle of the 20th century in manufacturing, firefighting, and countless household and consumer products, and are still used in many applications across the country.

Because of their continual use over decades, and because they persist in the environment, PFAS are transported through ecosystems and around the planet in myriad ways. A comprehensive analysis of data from more than 1,000 public water systems conducted by Environmental Working Group (EWG) found that PFAS chemicals currently contaminate the drinking water supply of more than 110 million Americans.¹ Similar studies have found evidence of widespread contamination in Europe, and PFAS have been detected at elevated levels even in the Arctic.^{2 3}

1.4 Common PFAS Sources

In the United States, common PFAS sources impacting the environment have been

traced to chemical production, industrial processes, industrial services, commercial services, landfill leachate, wastewater discharge, and certain types of fire-fighting foam. For this reason, regions of the country with a legacy of industrial production—or those near military bases and airports—have often been heavily contaminated. This includes numerous facilities throughout many parts of Michigan and the Great Lakes region.⁴

In southeast Michigan and the Huron River watershed, the most common PFAS sources identified to date are former discharge sites of fire-fighting foam and areas with a history of industrial use such as chrome-plating facilities, airports, and wastewater treatment plants. Several landfills have also been found to contain PFAS in their leachate. Other miscellaneous sites that warrant examination are car washes and automotive detailers, dry-cleaning services, and various other commercial operations which have been identified as PFAS sources (but, in all cases, to a lesser degree than industrial sites or areas where foam had been discharged).

PFAS commonly enter waterways after being discharged through municipal wastewater treatment plants (WWTPs). In such cases, plants have often identified industrial polluters through the Industrial Pretreatment Program (IPP) administered by the Department of Environment, Great Lakes, and Energy (EGLE). The IPP is a core part of the Clean Water Act's National Pollutant Discharge Elimination System (NPDES). By state law, municipal wastewater treatment plants are required to work with EGLE to reduce contaminants from their industrial contributors.

In 2018, EGLE began an Industrial Pretreatment Program PFAS Initiative that required all municipal WWTPs to determine whether they were passing PFOS or PFOA to surface waters and to implement corrective actions at confirmed industrial sources.⁵ Even so, there are still sites across Michigan where PFAS continue to be periodically and temporarily discharged above long-term compliance levels through WWTPs, due to methodologies and compliance intervals used by the respective Industrial Pretreatment Programs.

Note: Options for addressing challenges related to IPP compliance and enforcement are discussed later in this paper.

2. STATUS OF PFAS SCIENTIFIC RESEARCH, HEALTH EFFECTS, AND EXPOSURE THRESHOLDS

Although research into PFAS chemicals has begun in earnest in recent years, relatively little is known about many of them since, as a contaminant group, they largely avoided attention for decades. Also, most research into PFAS has been proprietary, conducted by the companies that created them. Thus, the public's scientific understanding of PFAS has been limited to initial research on a relatively small subset of compounds.

The two most commonly studied compounds are perfluorooctanoic acid (PFOA), also known as C-8, and perfluorooctane sulfonate (PFOS). These compounds have been manufactured the longest and are the most widespread in the environment. Both of them are in the subset of PFAS with longer carbon chains ("long-chain PFAS") and are no longer manufactured in the United States. However, U.S. chemical manufacturers have replaced these phased-out chemicals with alternative short-chain PFAS, such as GenX, which in many cases have also been found to be harmful.

Research into the behavior, health effects, and environmental impacts of PFAS has increased significantly in recent years, providing more clarity around issues related to specific families of PFAS chemicals. Overall, more refined data has revealed greater health risks from PFAS along with indications that PFAS are continuing to affect wildlife in various ways.

A prominent example is the case of "C-8," the trade name for PFOA, in Parkersburg, West Virginia. The story was captured in the 2019 feature film *Dark Waters*. Three decades ago, DuPont was caught poisoning residents of Parkersburg with PFOA. The company eventually agreed to supply an alternative source of drinking water to residents living near one of their Teflon plants, but only when PFOA levels in water exceeded 14 parts per billion (ppb). Since then, many PFAS have been found to be toxic at levels more than 1,000 times lower than those acknowledged by DuPont as being harmful.^{6 7}

EPA Standards and Recent Human Health Research Studies

The current U.S. Environmental Protection Agency (EPA) Health Advisory Level (Health Advisory Levels are non-binding and non-regulatory) recommends a level of 70 parts per trillion (ppt) for PFOA and PFOS in drinking water either individually or in combination. Numerous human health research studies in the U.S. and abroad have since recommended much lower levels:

- Independent researchers at Harvard and the University of Massachusetts recommended 1 ppt or less.⁸ The EPA has so far declined to use the Harvard/University of Massachusetts study or any other studies of people in setting its non-enforceable health guideline of 70 ppt.
- In July 2021, a draft report from the California Environmental Protection Agency was released that, if finalized, would set a public health goal (a non-binding target that influences state regulation) of 0.007 ppt for perfluorooctanoic acid (PFOA) and 1 ppt for perfluorooctanesulfonic acid (PFOS) in drinking water.⁹
- The German Environment Agency used human data to publish a safe blood serum concentration of 2 nanograms/milliliter for PFOA and 5 ppt for PFOS, that would reduce concerns for fertility and pregnancy, newborn weight, lipid metabolism, immune system impacts, hormone development, thyroid metabolism, and the onset of menopause.¹⁰
- Testing completed by the Centers for Disease Control in 2015 and 2016 show that more than one quarter of the U.S. population had PFOA at levels over 2.5 ng/ml and PFOS at levels over 8.1 ng/ml.¹¹
- Comparing the health risk limits set by Germany's Environment Agency to the CDC biomonitoring surveys of PFOA and PFAS in the U.S. population, more than one quarter of the American public may be exposed to health risks from just these two PFAS chemicals.

2.1 Health Effects

PFAS chemicals have been linked to several types of cancer, developmental and reproductive problems, thyroid disease, reduced immune system function, and other health effects (ATSDR 2018).¹²

Research into the health effects of PFAS is rapidly expanding, but many risks to humans have already been established for PFAS compounds that were or are widely used in the United States.

Among health effects that have been firmly established by the science are:¹³

- Testicular cancer
- Kidney cancer
- Ulcerative colitis
- High cholesterol
- Pregnancy-induced hypertension
- Thyroid disruption
- Hormonal changes
- Liver malfunction
- Obesity
- Immunotoxicity (e.g. interference with vaccine and child vaccine responses)
- Lower birth weight
- Delayed puberty, decreased fertility, early menopause
- Reduced testosterone
- Prostate cancer
- Decrease in bone density

This is a partial list and includes effects from several different PFAS compounds. The magnitude of the health risk from each compound differs, but the health effects are often similar or overlapping with other PFAS compounds. This makes it difficult for scientists to quantify the effects or establish causality from any specific PFAS compound; but, overall, the health negative effects of PFOA, PFOS, and other long-chain PFAS compounds seem to be broadly representative of the health effects of many PFAS

compounds.

2.1.1 Special Note: Intersection of PFAS Exposure and COVID-19

During the COVID-19 pandemic, previous concerns about how some PFAS chemicals were linked to reduced diphtheria and tetanus vaccine efficacy were raised. As the COVID-19 vaccines became available, this led researchers to ask if the PFAS concentrations in blood could potentially interfere with the COVID-19 vaccines.

According to the CDC and the Agency for Toxic Substances and Disease Registry (ATSDR), exposure to high levels of PFAS may impact the immune system. Evidence from human and animal studies indicates that PFAS exposure may reduce antibody responses to vaccines and may also lower resistance to infectious disease.^{14 15 16}

Unfortunately, COVID-19 emerged rapidly, and little was known about intersections with various poisons. As of 2022, only a handful of PFAS chemicals have been studied for human health effects, and the full scope of the PFAS crisis continues to emerge. More research is needed to understand how PFAS exposure may impact the course of illness from COVID-19.

3. ENVIRONMENTAL BEHAVIOR

It is unclear how long PFAS persist and behave in flowing waterways or how they interact at the groundwater-surface water interface (GSI). It is clear, however, that different PFAS chemicals behave differently. How long a PFAS chemical will remain an exposure risk to people or wildlife undoubtedly depend strongly on local hydrology, climate, weather, and land use. PFAS is known to persist in groundwater for decades, often with little decrease in sampled concentration, unless remediation steps are taken. In the Huron River, PFOS and PFOA levels measured at the same location over time decreased dramatically in concentration over a period of several months once the known source implemented filtration methods to remove PFOS and PFOA contamination, indicating moving surface waters are effective at transporting PFAS. PFOS and PFOA were also not present at notably elevated levels in stretches of the Huron where nearby groundwater adds overall flow to surface water, nor were elevated PFAS levels found in

nearby drinking water wells adjacent to the river.¹⁷

The Current Situation

At present, there is relatively little existing research on how PFAS persist and behave in the environment. Even so, it is clear they persist indefinitely on relevant practical timescales in dry soil contaminated by surface or groundwater discharge, as is the case where entities have discharged fire-fighting foam on dry ground.

An increasing number of studies has been conducted on PFAS compounds and wildlife in the Great Lakes region. A report published by the National Wildlife Federation in September 2019 provides an excellent overview of research to date.¹⁸

A Brief Summary of Notable Research Findings

In contaminated areas, PFAS has been found in the tissue of virtually all types of organisms with consistent exposure to those areas. Birds, mammals, insects, and fish all accumulate PFAS over time with exposure. Clark's Marsh, a highly contaminated site near Oscoda and Wurtsmith Air Force Base, has provided an especially unfortunate exposure pathway to many plants and animals and, as a result, has driven much of the research in that region.^{19 20}

Globally, many of the studies that have examined PFAS exposure to wildlife have confirmed the findings of smaller regional studies, namely that PFAS accumulates in tissues and tends to bind to proteins. While the specific conditions, sources, and species examined in studies from other countries differ, the basic conclusions hold true: (1) with repeated exposure, PFAS accumulates in organisms over time, and (2) contamination can be passed on to organisms that ingest contaminated animal tissue.



A Great Blue Heron feasts on a fish. PFAS accumulates in fish tissue and can accumulate in predators. Photo: Frank Miles, USFWS

The majority of studies wildlife in the Great Lakes region measure PFAS levels in birds and fish, or levels of PFAS repeatedly exposed to birds and fish in specific locations.²¹ Generally, PFOS is found at higher concentrations than other PFAS compounds in birds of the Great Lakes region.²² For example, studies of PFAS exposure and effects on tree swallows in the region have revealed an association between reduced hatching success and elevated PFAS exposures.^{23 24} Likewise, laboratory studies also indicate that higher concentrations found in Michigan may have negative biological effects on birds and other wildlife.

Risk Assessment

Because many other chemical exposures and natural factors affect organisms in the

environment, establishing causal links from PFAS exposure to ecological effects requires either large sample sizes over many years or analyses that carefully consider unquantifiable factors. Approximating thresholds for concern for PFAS (the lowest level at which adverse effects are likely to be present) usually requires controlled dose-response studies in laboratories with specific organisms. Considerations are then made to translate those thresholds to other species in the wild based on biological characteristics of those species. This is the basic method for establishing fish consumption guidance for various species.

When used with site-specific data and laboratory toxicity data, this methodology can also be applied to conduct screening-level ecological risk assessments that predict potential impacts to wildlife populations. One study employed this approach to model the exposure of various bird species to seven specific PFAS chemicals found in sediment and water samples near military bases in the United States. The study concluded that there was a potential for adverse effects for several species exposed to PFAS when they consumed benthic macroinvertebrates.²⁵



An EGLE staff person takes surface water samples from Pettibone Creek, a tributary of the Huron River. Photo: EGLE

3.1 Migration of PFAS in the Huron River

An analysis of data provided by Ann Arbor, EGLE, and the Wixom Wastewater Treatment Plant demonstrated contamination from the confluence of Norton Creek and the Huron River takes approximately six weeks to reach the drinking water intake at Barton Pond, 50 miles downstream. Distinctive peaks in measured contamination levels were found at each location six weeks apart, with some variation due to weather and river conditions.

This indicates a migration rate in the river channel of about 0.05 miles per hour. Note

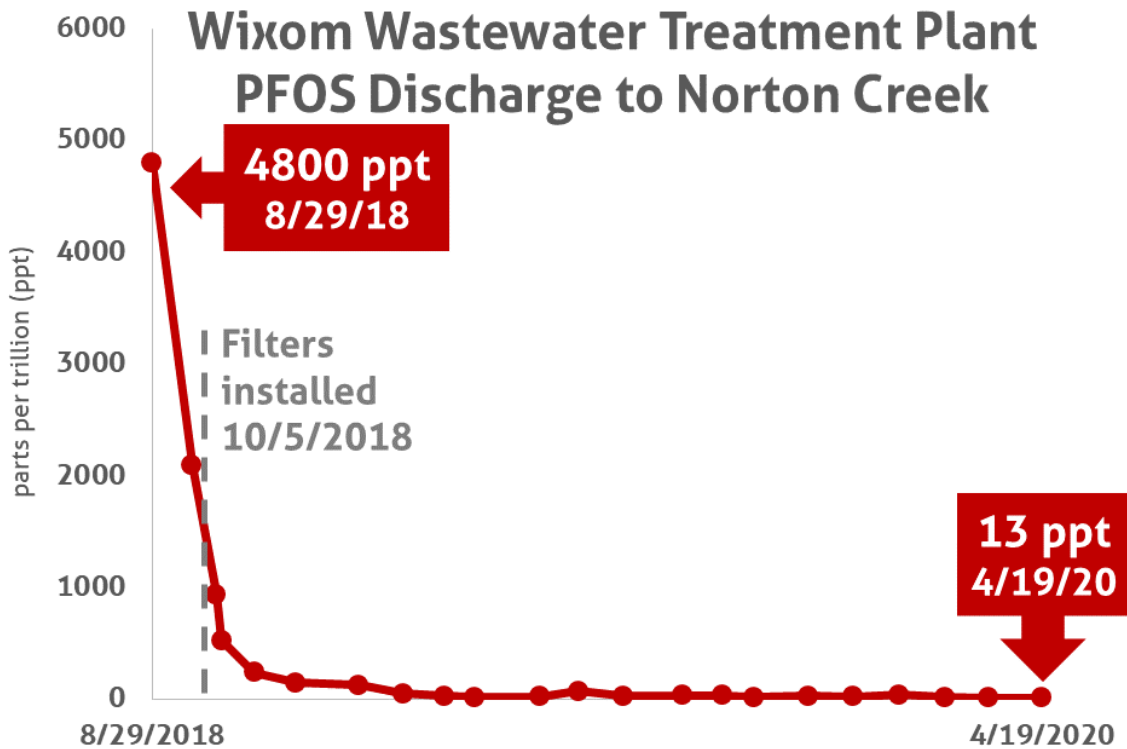
that concentrations decreased significantly, by as much as two orders of magnitude, before reaching Ann Arbor from Norton Creek.

4. PFAS IN THE HURON RIVER WATERSHED

PFAS were found in the Huron River in 2014 after the City of Ann Arbor tested its drinking water source for some PFAS compounds. As more information on the harmful effects of these chemicals became available and the state of Michigan updated its guidelines, PFAS contamination became a major concern in the Huron River.

In 2018, PFAS was found in numerous tested fish from multiple species, and a Do Not Eat Fish advisory was issued. As a result of increased public awareness, attention was focused on a concerning spike in PFAS levels in the City of Ann Arbor's drinking water. Spurred on by growing alarm among residents, the state of Michigan began to investigate the watershed for PFAS contamination, starting with Ann Arbor's source water and expanding across the watershed.²⁶

As is commonly said, water does not respect political boundaries. This watershed-wide investigative approach highlighted the interconnectedness of communities through their water resources and the need for remediation policies that work across traditional boundaries of counties, municipalities and voting districts. Contamination in the upper watershed, discharged to a tributary, directly affected the safety, practices, and finances of communities down river. Treated wastewater in one location is raw source drinking water in another. Remediation of PFAS in the Huron River watershed demonstrates why it is far more effective, both in terms of cost and in terms of the total mass of contaminants removed from the environment, to address pollution at the source than to treat drinking water for PFAS at the point of use.



PFOS in effluent discharged through the Wixom Wastewater Treatment Plant from Tribar Manufacturing, to Norton Creek, a tributary of the Huron River, declined sharply after the drainage pipe was closed and granular activated carbon filters were installed. PFOS levels have remained near state drinking water standards since 2020.

4.1 PFAS in Drinking Water

As of 2021, all municipal sources of drinking water in the Huron watershed have been tested and are compliant with state regulations regarding PFAS. PFAS has been found in drinking water supplies, but at low levels. Research continues to advance and further inform the risk that the presence of PFAS presents to human health.

The Huron River is the main source of drinking water for the city of Ann Arbor. Approximately 85% of Ann Arbor’s source water comes from the Huron River. The remaining 15% comes from multiple wells located south of the city.

Following the third Unregulated Contaminant Monitoring Rule (UCMR 3) established by the EPA, which requires large utilities to test for PFAS and a host of other contaminants, the city of Ann Arbor began testing its drinking water for several PFAS in March 2014. These tests examined both the untreated “raw” source water from the Huron River and treated drinking water.

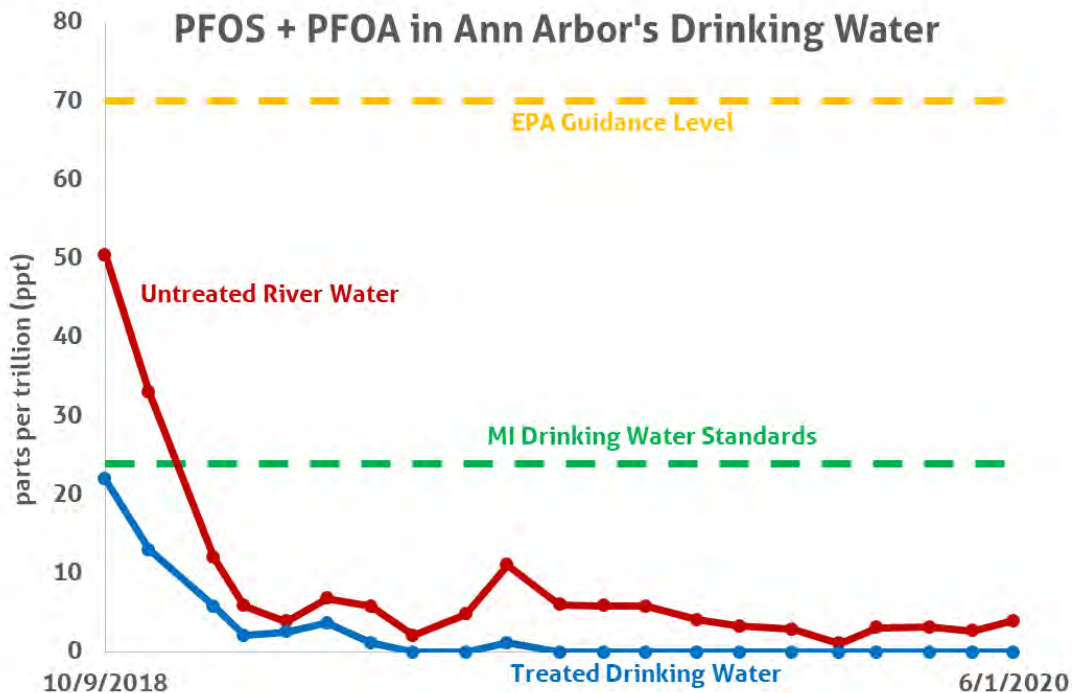
Since then, Ann Arbor has continued to test both finished drinking water and the river source water for PFAS monthly, if not more frequently. Regular updates are provided to the public.²⁷ The city is also experimenting with and continues to evaluate methods for removing PFAS in the drinking water treatment process.



“Do Not Eat the Fish” signs were placed at all public access points along the river beginning in 2018 following the issuance of the Do Not Eat advisory by MDHHS and DEQ (now EGLE). Photo: D. Brown, HRWC.

Remediation Efforts to Date

Currently, granular activated carbon (GAC) filtration is the most cost-effective technology for removing PFAS in drinking water. The City of Ann Arbor previously used GAC filters and has been piloting a new type of carbon that more effectively removes PFAS in several of its drinking water plant filters since November 2017. Based on positive outcomes, all older carbon were later replaced to more effectively filter PFAS. The initial estimated additional cost to replace GAC filters in fiscal year 2019 was \$850,000. Additional annual costs to treat for PFAS are estimated at \$300,000.



This figure shows the level of detected PFOS and PFOA in Ann Arbor's treated and untreated drinking water relative to EPA guidance levels and state criteria. The green line indicates the summed value of Michigan's PFOS and PFOA criteria levels. The yellow line indicates the summed value of EPA's PFOS and PFOA guidance levels. PFOS and PFOA levels have been below the detectable limit in Ann Arbor's treated drinking water since 2020.

4.2 PFAS in Huron River Fish

In early August of 2018, fish tested in portions of the Huron River were found to contain “extremely high” levels of PFAS, so high that any consumption of fish would pose a health risk. On August 4, the Michigan Department of Health and Human Services (MDHHS) issued a ‘Do Not Eat Fish’ consumption advisory for parts of the river. The advisory was updated on August 31, 2018 to include all fish in the Huron River in Livingston, Oakland, Washtenaw,



Suspected PFAS foam occurs periodically on the river. Hubbel pond in Milford, Kent Lake in Kensington Metropark, Portage and Little Portage Lakes near Pinckney, and Barton Dam in Ann Arbor have all been sites where such foam has been spotted. (Photo: HRWC)

Wayne, and Monroe Counties, starting where North Wixom Road crosses the river and extending downstream to the mouth of the river as it enters Lake Erie. Given the known patterns of fish mobility, spawning, and migration, HRWC recommended that no fish be consumed from connected lakes or tributaries as well.

On May 2, 2022, nearly four years after the initial advisory, MDHHS relaxed some of the recommendations on the lowest extend of the Huron River below I-275. Several advisories for limiting consumption of specific fish species remained in place, as did the Do Not Eat advisory for most of the Huron River. The updated guidance, however, demonstrated that PFOS levels declined following the removal of a major source of contamination to the river. At the same time, MDHHS also provided consumption guidance for several lakes in the Huron River watershed that are unconnected to main stem of the river, highlighting the lower level of widespread contamination the environment.

4.3 PFAS in Foam

Due to its properties as a surfactant, PFAS readily concentrates in foam on surface waters. In some cases, PFAS concentrations in foam have been found to be several orders of magnitude higher than in adjacent non-foamy surface water. For this reason, the state has issued guidelines advising the public to avoid contact with and ingestion of foam. These guidelines emphasize the fact that young children and pets are particularly at risk, since they are more likely to ingest the foam—in the case of children by placing their hands in their mouths, and in the case of animals by licking their fur.

Foam generated by PFAS tends to be bright white with a smooth surface texture that resembles shaving cream. It piles up on shores, blows inland and tends to be tacky or sticky. State officials and experts began sharing this information with affected communities in 2019, the same year that EGLE began treating the occurrence of such foam as potential contamination, especially in unexpected locations.

Residents can report suspected PFAS foam by calling the Michigan 24-hour Pollution Emergency Alert System (PEAS) hotline at 800-292-4706 or by filling out a pollution

spill form.²⁸ The state also encourages taking a photo of the foam while being careful to avoid contact. A summary of guidelines is available on HRWC's website.²⁹

During 2019 and 2020, HRWC received numerous reports of suspected PFAS foam, many accompanied by credible photos and descriptions. Unfortunately, it was difficult for state officials to collect foam samples from reported locations in a timely manner. Overall, Portage and Little Portage lakes tended to have high concentrations of apparent PFAS foam, although subsequent surface water tests found no elevated PFAS levels.

The issue is further complicated by the fact that surfactants and harmless chemicals can create a substance resembling PFAS foam. Also, PFAS has the ability to concentrate in naturally occurring river foam and in foam that does not conform to the “shaving cream” description. Consequently, HRWC advises users of the river and connected waterways to treat all foam as potentially containing elevated PFAS levels.

4.4 Impact on River Recreation



Paddlers on the Huron River. Photo by HRWC.

Prior to the pandemic, the Huron River served over 125,000 unique users and visitors each year and drove a local annual economy of \$53.5 million.³⁰ For these reasons the effects of PFAS on recreation has been a major concern across the entire watershed region.

The cumulative economic effects of PFAS on river recreation have not and likely will not be quantified. This is due in large part to the COVID-19 pandemic, which has made quantifying changes in river usage extremely difficult. Driven by indoor business closures, river usage surged by anywhere from

150% to 400% during the 2020 paddling season, and many private liveries reported

their busiest and most profitable years ever. However, these anecdotal reports followed continuing reports of concerns expressed by both paddlers and livery owners relating to PFAS exposure during the 2019 season.

We know that many anglers, particularly those with the means to travel, avoided fishing on the Huron River in 2019, citing their inability to eat fish they caught. We also know that all liveries on the Huron reported group trip cancellations due to PFAS exposure concerns during that same year. In addition, HRWC staff received frequent calls from concerned residents about the safety of paddling or swimming in the Huron River.

5. SUMMARY OF STATE ACTIONS

5.1 Monitoring, Investigation, and the Michigan PFAS Action Response Team

In 2017, the State of Michigan launched a multidisciplinary PFAS Action Response Team (MPART). During the summer of the following year, the Michigan Department of Environmental Quality (MDEQ), now the Michigan Department of the Environment, Great Lakes, and Energy (EGLE), conducted surface water testing at approximately 15 sites throughout the watershed in an attempt to identify a PFAS source in the Huron River. Additionally, the Michigan Department of Natural Resources (MDNR) collected fish samples.

Since those initial investigations, EGLE, MDNR, and MDHHS have tested drinking water from all public sources in the watershed as well as private wells that provide a public service, such as those at private schools, campgrounds, community gymnasiums, etc. **The results of those tests are posted and periodically updated on the MPART website.**

In recent years, EGLE has also begun testing for PFAS near other sites where past PFAS use was suspected, including landfills and legacy industrial sites. As of 2021, several contaminated sites have been found in the Huron River watershed. In general, there is

little risk to private drinking water wells but in some cases, drinking water wells may be affected. In at least one case, a private drinking water well at a manufacturing site, referred to as the Former Chrysler Scio Introl Division Site, was found to be highly contaminated with PFAS. Information regarding many of these sites continues to evolve.

More details on PFAS sites throughout the watershed are available in the Appendix to this report.

Through the efforts of MPART and EGLE, state agencies have maintained a robust program for identifying and monitoring PFAS-contaminated sites and areas of concern across Michigan. MDHHS and MDNR have also been engaged in several programs relevant to the Huron River watershed and area residents. For example, state officials have collaborated with experts, federal agencies, and local officials to advance public health and toxicological studies monitor public drinking water sources, conduct area investigations, investigate effects on wildlife, and attempt to understand the behavior of PFAS under various environmental conditions. The role of state agencies continues to evolve.

Updated information is available at the Michigan PFAS Action Response Team website at <https://www.michigan.gov/pfasresponse>.

5.2 MPART Citizens Advisory Workgroup

In 2019, MPART established the Citizen's Advisory Workgroup (CAWG) to solicit feedback from affected community members and improve PFAS-related communications from state agencies. A watershed planner from HRWC joined the CAWG to represent Ann Arbor specifically and the watershed generally. Other watershed community members have also been involved and active. Membership in the CAWG has proven to be a reliable and efficient way to connect with state officials.

HRWC strongly recommends that local environmental protection organizations and members of PFAS-affected communities in Michigan join the CAWG.

For organizations outside Michigan, if a CAWG does not exist in your state or province,

HRWC strongly recommends environmental protection organizations advocate for the formation of a similar citizen advisory group.

5.3 Establishment of PFAS Drinking Water Standards

The State of Michigan established official drinking water standards, known as Maximum Contaminant Levels (MCLs), for seven PFAS chemicals in August 2020 following a formal assessment and review. The process, initially ordered on an aggressive timeline by Governor Gretchen Whitmer, was delayed due to the COVID-19 pandemic.

Establishment of the drinking water standards received broad support from affected communities as well as environmental and public health advocacy groups, public health officials, independent toxicologists, and medical experts. However, most groups strongly agreed that the proposed standards, while a good first step, were not sufficiently protective of public health or the environment.

Many groups provided robust, peer-reviewed scientific studies to justify their claims to state officials and review boards, their efforts had little to no effect on the final drinking water standards or recommendations issued by state officials. Pushback was limited to some industry and manufacturing interest groups that opposed the drinking water standards, with business costs and implementation challenges cited as reasons for opposition.

Many environmental groups felt that although the science was clear and a growing body of literature supported lower limits on various PFAS in drinking water, the proposed state limits represented a satisfactory and crucial first step in protecting Michigan residents. Several toxicologists provided opinions to state officials recommending that PFAS be considered as a class of chemicals with overlapping and cumulative health effects, rather than individual chemicals.

Before the drinking water standards moved on to final approval, several state officials went on record as noting that, since the proposed rules generally fell between the perspectives offered by scientists and environmental advocacy groups, and those put forward by industry advocates, the state was likely proceeding correctly. This

commentary from state officials continues to be concerning to many public health experts and environmental groups, HRWC among them.

Since the values used in the drinking water rules were established, additional research and synthesis of the existing literature has clarified that health effects from specific PFAS chemicals, commonly at exposures below the Michigan MCLs, continue to be a health concern for certain populations.

5.4 Establishment of Cleanup Criteria (Part 201)

In December 2020, following the establishment of MCLs in August 2020, the new drinking water standards also updated Michigan's groundwater cleanup criteria of 70 ppt for PFOS and PFOA.

The new groundwater standard is 8 ppt for PFOA and 16 ppt for PFOS. MCLs for the following 5 PFAS compounds became groundwater cleanup criteria by default:

- PFNA (6 ppt)
- PFHxS (51 ppt)
- PFHxA (400,000 ppt)
- PFBS (420 ppt)
- HFPO-DA (370 ppt).

EGLE staff use all 7 PFAS criteria to guide groundwater investigations, protect public health, and identify MPART PFAS sites.

The cleanup criteria are effectively in place due to the establishment of MCLs and the absence of other relevant thresholds at the state or federal level that could be used as Part 201 cleanup criteria.³¹ Chemical and manufacturing industries voiced opposition to the establishment of cleanup criteria, while environmental organizations and public

health advocates supported the rule change.

6. SUMMARY OF FEDERAL ACTIONS

Prior to 2021, federal action regarding PFAS was slow to nonexistent. Over the last 25 years, the EPA has recommended voluntary elimination of the production and use of only two PFAS—PFOS and PFOA. In 2015, the agency proposed a Significant New Use Rulemaking for some long-chain PFAS which would require 90 days advance notice before use of PFOA and related chemicals. These limited regulations apply to approximately 300 PFAS chemicals, but it remains unclear if the EPA's actions have resulted in reduced use, release, and/or human exposure to the chemicals.

No other regulatory actions or recommendations from federal agencies have been made since.

In 2020 and early 2021, the EPA—under direction from the Trump administration—weakens a major scientific assessment of PFAS in drinking water. Administration officials at EPA who had previously launched a PFAS Action Plan later fought efforts by lawmakers to accelerate work on a federal drinking water limit for the chemicals. In 2018, White House officials attempted to block a CDC assessment finding that PFAS are dangerous at much lower levels of exposure than current EPA recommendations indicate.

Most federal action on PFAS has come from lawmakers, often in the form of budget amendments. Members of both Congress and the Senate proposed amendments to the National Defense Authorization Act, for example, that would direct funds toward cleanup and monitoring efforts at military bases.³² While these actions are welcome and reduce exposure risks to residents in communities suffering from PFAS pollution, they do not address the root causes of contamination

In July 2021, the U.S. House passed the PFAS Action Act, which would require the EPA to set national drinking water standards. The key provisions of the PFAS Action Act are:

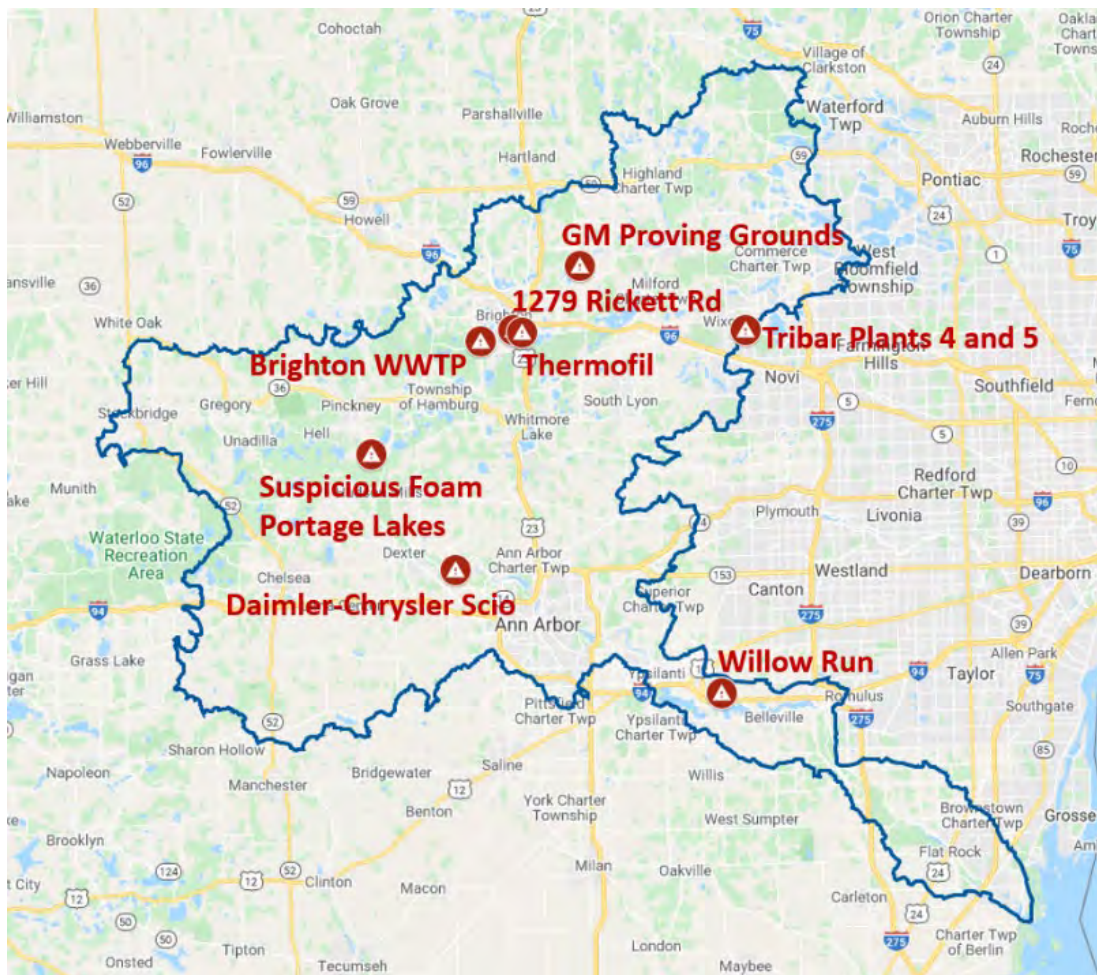
- Establishing a national drinking water standard under the Safe Drinking Water Act

Addressing PFAS Contamination in the Huron River Watershed

SDWA) for PFOA/PFOS within two years;

- Determining whether to list PFOA/PFOS as “hazardous substances” under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) within one year, and all other PFAS compounds within five years; and
- Designating PFOA/PFOS as “hazardous air pollutants” under the Clean Air Act (CAA) within six months.

Despite earlier optimism members of Congress in both major parties, as of April 2022, the PFAS Action Act appeared to have stalled in the Senate with little momentum to be passed.



Map showing major identified contamination sites in the Huron River watershed. Updated 2021. Figure: HRWC

7. HURON RIVER WATERSHED PFAS SITES AND AREAS OF CONCERN

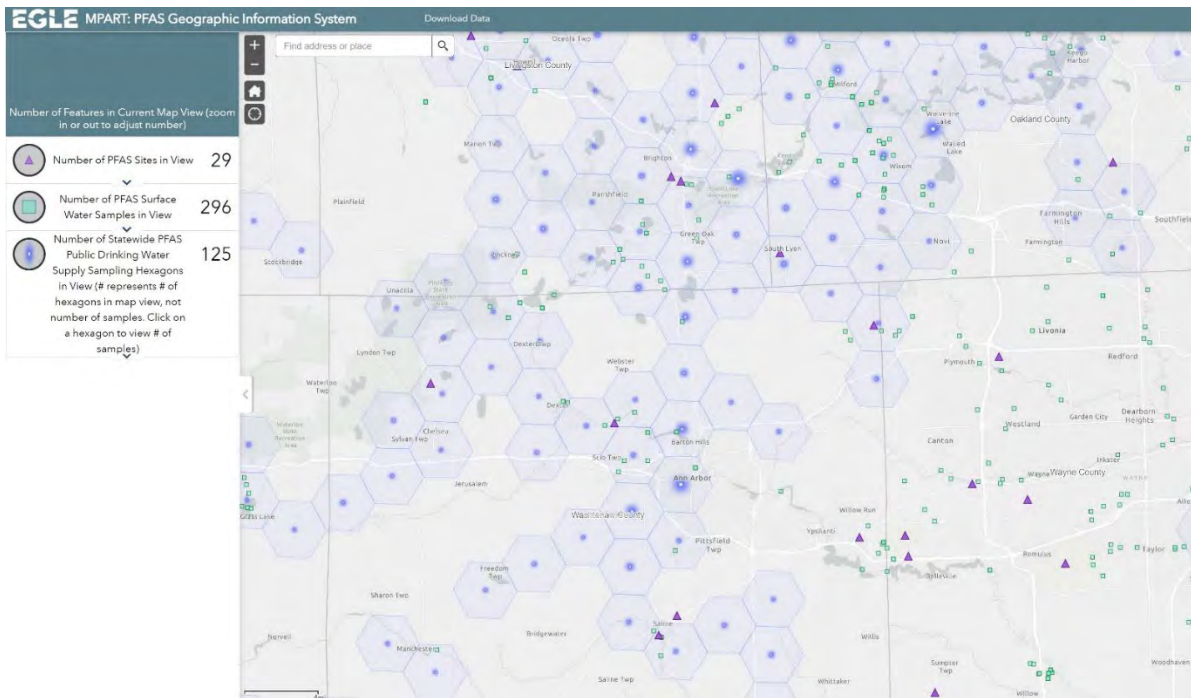
In January of 2022, the Michigan PFAS Action Response Team (MPART) released the **PFAS Geographic Information System**. This interactive map tool combines data from several monitoring efforts into a single “one-stop-shop” application. It was created at the request of numerous individuals and organizations, HRWC among them.

With the PFAS Geographic Information System, users can zoom into a specific area quickly and see where surface or drinking water samples have detected PFAS. They can also locate any known PFAS-contaminated sites nearby, gauge the level of risk, and determine whether they need to take action to protect themselves from these toxins. In other words, the interactive map can answer the same questions fielded by environmental groups within the Huron River watershed accurately and quickly.

Tools such as this—which combine layers of data into a single, user-friendly, publicly-accessible platform—will be needed in communities nationwide as concerns about PFAS and other contaminants continue to grow.

For specific details on sites in the Huron River watershed where PFAS has been detected, refer to the Appendix.

Addressing PFAS Contamination in the Huron River Watershed



A screen capture of the MPART PFAS Geographic Information System centered on the upper and middle Huron River watershed. Purple triangles indicate PFAS sites. Green squares indicate where surface water samples have been taken. Blue hexagons show the number of drinking water samples taken within each hexagon. The results of state-led sampling efforts show low levels of widespread contamination with several locations exceeding cleanup criteria.

8. OTHER ONGOING CONCERNS

PFAS contamination is now pervasive throughout our natural environment and built infrastructure. The Huron River Watershed Council's primary concerns and areas of expertise include intersections with waterways, the environment, and drinking water systems. Many other dimensions of the PFAS crisis, which fall outside HRWC's focal concerns, warrant attention and collaboration with experts in relevant fields. Examples include potential exposure pathways such as PFAS in biosolids, compost, and consumer goods.

8.1 PFAS in Biosolids

Elsewhere in the United States, increasing attention is being paid to agricultural runoff

from farms that have been known to apply biosolids containing PFAS as fertilizer. While there is no direct evidence that this is affecting the Huron River watershed, we do know that many farms in the watershed have used biosolids from wastewater treatment plants that were previously discharging PFAS. It is therefore possible, if not probable, that some PFAS is making its way to our surface water and groundwater from past applications of PFAS in these biosolids.

Upon realizing that Wixom's wastewater treatment plant had PFAS in its effluent, plant operators suspended the export of biosolids from their operations for agricultural use, as have other WWTPs in Michigan.

In 2021, concerning levels of PFOS were found in beef raised on a farm near the edge of the Huron River watershed in Livingston County. The farm sold beef locally for many years, mostly in nearby communities. The source of the PFOS contamination was biosolids applied to farm fields as fertilizer from 2010 through 2015. The biosolids came from the Wixom Wastewater Treatment Plant, and the PFOS in those biosolids came from Tribar Manufacturing.

Finding and implementing solutions to legacy use of PFAS-laden biosolids in the U.S. will be a tedious process. Past use of polluted PFAS was likely widespread, but it is uncertain how application to various crop types presents risks to public health. It is also uncertain what enforcement actions could or should be taken in various agricultural cases.

8.2 PFAS in Compost

PFAS have been found in municipal and for-profit compost across the U.S., including in Ann Arbor's compost. While the detected levels are concerning since they indicate the long-lived, cyclical nature of PFAS pollution in the environment, it's unclear what various PFAS levels in compost mean in terms of risk for human health. It is even less clear how various fauna may take up PFAS from composted soil.

Out of caution, HRWC recommends that compost known to contain PFAS should not be used for gardens containing edible plants, nor should PFAS-tainted compost be used in

areas where it could infiltrate drinking water wells or surface waterways.

8.3 PFAS in Consumer Goods

PFAS have been used in virtually all sectors of the U.S. economy for many decades. They are found in various consumer goods such as food wraps, stain-resistant carpeting, lawn fertilizers, nonstick cookware, clothing, waterproofed products, home building materials, dental floss, and cosmetics.

While many of these goods may be creating dangerous exposure pathways for humans, the complexity of how PFAS are used in these products and their relative health risks are beyond the capacity of regional environmental organizations to address. Watershed protection groups and local community partners can help elevate awareness among resource organizations and advocacy agencies that are pursuing practical and political solutions to PFAS use.

HRWC's viewpoint is aligned with that of toxicologists and other expert groups in advocating that all non-essential PFAS use should be eliminated by local, state, or federal policy.

9. RELIANCE ON STATE AGENCIES AND EXISTING RELATIONSHIPS WITH SCIENTIFIC EXPERTS AND THE PRESS

From the time the PFAS crisis came to light in the Huron River watershed in 2018, monitoring and investigatory actions of drinking water have been rapid. Policy changes have progressed much faster than during similar issues of emerging contamination in the past, and public awareness has increased dramatically.

Most state agencies have worked to incorporate PFAS into their various programs. Many of those initiatives followed from directives by Governor Rick Snyder or Governor Gretchen Whitmer, but others were enacted at the discretion of unelected officials.

HRWC staff and other groups throughout the state rely on state officials to disclose vital information in a timely and detailed fashion. In cases where officials have missed important details or when progress has lagged, networks of engaged citizens, many of them scientific experts, have helped maintain momentum by continuing to advocate for more information and greater transparency. Numerous journalists across Michigan have also been extremely engaged and timely in their reporting of the PFAS crisis within our watershed and elsewhere.

Throughout the emerging PFAS crisis, HRWC has maintained its existing relationships with local members of the press and with networks of scientific experts throughout the state. These networks have been crucial in our ability to uncover facts and assimilate new information into our strategies.

On many occasions, HRWC staff found themselves in the role of information broker to the press. As an NGO, we are able to share facts and opinions more freely than state officials. This valuable function of watershed councils and local environmental groups cannot be overstated.

Watershed councils should be prepared to interact with the press as independent sources of reliable, science-based information, and should also maintain strong relationships with experts in academia and state agencies.

10. COLLECTIVE ACTION OF ENVIRONMENTAL CONSERVATION AND COMMUNITY ADVOCACY GROUPS

Many environmental advocacy groups came together to support the establishment of Maximum Contaminant Levels. These groups included, but were not limited to, the Huron River Watershed Council, the Michigan League of Conservation Voters, Need Our Water, FLOW, the Sierra Club, the Michigan Environmental Council, the Great Lakes Environmental Law Council, the National Wildlife Federation-Great Lakes, and the Ecology Center.

Early, ongoing, and sustained communication among state and regional environmental organizations was, and continues to be, essential to the rapid implementation of drinking water standards in Michigan. Each group brings different areas of expertise to the task at hand. Some have legal experts and attorneys on staff. Others conduct research on environmental conditions and wildlife. Still others, whose members include policy analysts, specialize in direct outreach to residents and other grassroots organizations at the local level.

These complementary resources and skills vastly increased the collective sharing of educational materials with local or regional partner groups, and vastly enhanced the transmission of information through social and professional networks.

To help address all emerging environmental threats to watersheds, HRWC recommends that watershed conservation organizations adhere to a strategy of remaining engaged with other groups whose interests overlap with their own, as well as organizations that translate their interests to other geographic regions.

10.1 Advocacy for Drinking Water Standards and Cleanup Criteria

Central to policy action on PFAS has been the establishment of drinking water standards, referred to as Maximum Contaminant Levels (MCLs) in Michigan. Since the EPA has still not implemented any significant policy or regulatory actions, responsibility for addressing the PFAS crisis is left to the states. As a result, many states have established drinking water standards at various but similar levels.

Because they are often referred to in many statutes and procedures relating to site cleanup and discharge, drinking water standards are not only important as a means of protecting residents on municipal water supplies from exposure, but also for reducing overall environmental contamination. For these reasons, HRWC joined with many statewide organizations in aggressively supporting the establishment of Health-based Values³³ and MCLs.

As scientific understanding improves and more PFAS are linked to actionable health or environmental effects, we recommend that local conservation groups and watershed councils vigorously support the continuous adjustment and expansion of MCLs based on new information.

10.2 Amicus Briefs and Supportive Advocacy

In April of 2021, 3M, one of the major manufacturers and users of PFAS and PFAS products, including ScotchGard, sued the State of Michigan for its PFAS regulations, challenging the process by which the rules were established. Michigan is not the first state where 3M has filed a brazen, transparently frivolous lawsuit, nor is the company a trustworthy source in matters of the public interest. 3M is currently paying \$55 million as part of a settlement for PFAS contamination from Wolverine World Wide.³⁴ In addition, a 2019 Detroit Free Press investigation revealed that 3M had been aware of the dangers of PFAS for decades and had actively hidden that information from potentially affected residents.³⁵

At the time of this writing, the 3M lawsuit against the State is in its early phases, but environmental law experts that HRWC has consulted believe the suit to be without

merit. The lawsuit filed by 3M is consistent with standard corporate legal strategy regarding contamination and regulation. When faced with the likelihood of losing, a corporation will typically pursue a policy of filing a lawsuit, delaying, and leveraging their significant financial advantage to wage a war of legal attrition against underfunded and overworked state agencies and attorneys. Even when they lose, as often happens, the companies effectively buy themselves years, if not decades, to continue their business of polluting at the expense of public health, the environment, and taxpayer dollars.

In response to the lawsuit, many organizations came together to intervene and set the record straight. Led by the Great Lakes Environmental Law Center and the Natural Resources Defense Council—and with support from HRWC, NWF, the Ecology Center, For the Love of Water, the Michigan Environmental Council, the Sierra Club, PFAS Alliance, and the Tip of the Mitt Watershed Council, the group submitted an amicus brief for consideration by the court supporting the state's PFAS drinking water standards. The goal of the brief was to describe how PFAS have affected our communities and to clarify for the court how important these protections are to the well-being of Michiganders.

In order to respond effectively to the legal tactics of corporate polluters acting to protect their own financial interests, watershed councils, local organizations, and national and international NGOs must continue to cultivate informed, vigilant members and partners. This challenge will continue, unabated, until fundamental regulatory reforms are put in place that prioritize the health of people and the environment over privatizing profits.

Because legal actions are often well beyond the financial capacity of local or regional groups, coalition building is an essential strategy. HRWC recommends that all watershed councils and local agencies work to build community advocacy partnerships around issues on which they agree.

10.3 Identification of Suspected Legacy Contamination

In several cases, watershed residents and local officials—many of whom have lived in the watershed for decades—have communicated potential contamination of specific sites based on their history of use. Typically, this information is unknown to state officials but can provide important, actionable data for site investigations.

The information is often unverifiable, so corroborating statements or quantitative sampling at sites is needed to confirm contamination. Even so, such claims have led to the monitoring of multiple sites in the watershed.

Local knowledge is valuable, and watershed councils should take claims of contamination seriously.

10.4 Local Partner Network

HRWC has strong connections with county health departments, drain and water resource commissioners, municipal officials, and a broad network of businesses and environmental groups. This network has been crucial for coordinating efforts at both local and multi-county scales. As PFAS and other issues continued to emerge with greater frequency, HRWC began meeting regularly with its Ann Arbor area partners to assure that all water quality information was being communicated accurately, effectively, and consistently.

Most watershed councils have deep connections with the local communities they represent. HRWC recommends building on those relationships to make communication around emerging contaminants clear and consistent.

11. COMMUNICATION STRATEGY AND ACTIVITIES

11.1 HRWC Communication Plan for Emerging Contaminants

The Huron River Watershed Council began considering community engagement strategies to build awareness around PFAS even before the Do Not Eat Fish advisory was issued in August of 2018. The advisory elevated and focused concerns on a particular issue, garnering substantial media attention. From the earliest stages of the emerging crisis, HRWC crafted a successful strategy by following several basic principles, all of which we continue to follow:

- 1. Be as transparent as possible as early as possible.**
Don't be afraid to convey what is uncertain or unknown. Being honest and forthright will help avoid unwarranted panic and misinformation.
- 2. Respond as quickly as possible to new information or new narratives.**
Fast response times helped HRWC prevent the spread of misinformation.
- 3. Coordinate frequently with a network of partners within the watershed to make sure public messaging is concise, accurate, clear, and coherent.**
Even minor differences in phrasing among organizations can lead to misunderstanding, doubt, and misinformation.
- 4. Provide information in a variety of formats.**
In the case of the PFAS crisis, this included developing an informational webpage and updating it regularly; creating printed fact sheets; offering to give presentations throughout the watershed; and convening public forums with experts. These efforts helped us to reach a wide and diverse audience, and to provide that audience with a variety of options for engagement.
- 5. Serve as a convener of experts at the federal, state, county, university, and local levels.**

This function is perhaps the most important for regional conservation and watershed groups. Issues that surround emerging contaminants will quickly become too complex for any single organization to manage alone. Multiple regulatory agencies will be involved, along with polluters and grassroots advocacy groups. For these reasons, it is essential for watershed-focused organizations to use their experience in bringing communities and other groups together around local water issues.

11.2 HRWC Communication Initiatives

Signage

Following state guidance for signage, HRWC worked with county health departments, state parks, and the Metroparks to identify the most effective locations for placing Do Not Eat Fish advisory signs and determining which languages to include. We followed a similar model in providing the public with guidance on avoiding river foam.

Additionally, HRWC worked with liveries to develop specific messaging for kayaking and recreation on a river contaminated by PFAS. The intent of this messaging was to keep people safe while also encouraging them to stay healthy and enjoy their natural resources.

Online Engagement

Continued online engagement was critical. Early on, HRWC developed a one-stop PFAS informational webpage (HRWC.org/pfas) to serve as an introductory landing site for the latest PFAS information. As that information continued to expand and evolve, the format and content of the page changed dramatically. Our intent is to eventually create a page with relatively stable content that provides links to other key resources.



HRWC PFAS website page

As the PFAS crisis has matured and the level of basic awareness among watershed residents has grown, blog posts and newsletter articles have been the most important and effective means of getting information to the public in an easily searchable format.

Blogs, op-eds, and other updates associated with specific events in the watershed were and will continue to be written by multiple HRWC staff members.

HRWC posted the media coverage and updates to its social networking channels to inform the public and drive readership to its PFAS content.

Community Presentations

Direct engagement is essential. Recognizing that not all online information, print communications, and other engagement efforts would reach all area residents, HRWC staff made numerous, regularly updated presentations on PFAS issues in the Huron River watershed and will continue to do so for the foreseeable future. A key element of this dimension of community engagement involves discussing PFAS in the context of other issues such as river recreation, overall water quality, water treatment, and water infrastructure improvements.

Over time, HRWC has built community awareness by making presentations to a wide range of groups, including:

- Township Boards, City Councils, and County Boards of Commissioners
- Local recreation groups, including anglers, sailing clubs, and paddling groups
- Local paddlesport providers
- Breweries, restaurants, and coffee shops
- Regional outdoor recreation gear retailers
- Homeowner associations and lake associations
- Grassroots environmental stewardship organizations, such as “Friends of” groups
- Local environmental groups, such as chapters of the Audubon Society and Sierra Club
- Statewide and regional conferences for engineers and planners
- Statewide, regional, and national conferences for environmental advocacy and environmental justice organizations

As more information continues to emerge, the content and focus of our presentations

has changed as well. We have found that it is vital to tailor existing information to specific communities or relevant sites in the watershed, based on the specific audience being engaged.

Hosted Public Forums and Participation in Public Meetings

In 2018, HRWC hosted large public forums attended by more than 200 area residents each in Milford and Ann Arbor. HRWC participated or hosted similar forums through 2019 in locations throughout the watershed. Each drew anywhere from 40 to 120 area residents. In all cases, interest in the topic of PFAS was high and all venues were at or near capacity.

HRWC also participated in several relevant panels per year from 2018 through 2021, all of which were well-attended and hosted by publicly elected officials.

Early on, HRWC developed the idea of convening local officials and experts to provide potentially affected residents with information. Given that PFAS was Michigan's first major environmental emergency to emerge in the wake of the Flint water crisis, affected communities were often distrustful or skeptical of state agencies, regulators, and municipal departments. As an independent NGO, the Huron River Watershed Council was able to disseminate accurate information while also providing a civil forum for residents to ask questions and hold regulators and public bodies accountable.

The role of serving as watershed-wide convenors was perhaps the most important element of our response to PFAS as emerging contaminants, and one we strongly recommend all watershed councils be prepared to fill.



Congresswoman Elissa Slotkin hosted a PFAS information forum in 2019. HRWC, local officials, and state experts participated in a panel discussion. Attendance and resident interest remained high at such meetings.

River Walker Program to Directly Engage Anglers

In 2020, HRWC partnered with MDHHS and the nonprofit Michigan Public Health Institute (MPHI) to develop a “river walker” program for the Huron River. The program trains people to walk (or otherwise traverse) sections of the Huron River and its watershed to directly inform anglers about how to consume fish safely.

The direct engagement method allows HRWC and MDHHS to reach fishers who may not be receiving accurate information from traditional methods such as signage, newsletters, webpages, or social media posts. Direct engagement is especially useful in high-risk communities that also have low levels of engagement with their local watershed and/or environmental protections groups. It is also an important tool for reaching anglers who may come from outside the watershed or even the state, and who

may not be aware of fish consumption advisories and guidelines.

HRWC developed guidance for the river walkers, helped train them in how to connect with users in different parts of the watershed, provided maps and recommended routes for efficiently engaging anglers, and assisted with data collection and processing.



An HRWC river walker discusses PFAS contamination with an angler in Ypsilanti. Photo: D. Brown, HRWC.

11.3 Common Questions and Watershed Resident Concerns

Shortly after the Do Not Eat Fish advisory was issued for the Huron River, HRWC staff catalogued every PFAS-related question received by our staff and by organizational partner staff members. During the large public forums described earlier in this document, audience questions were collected on note cards. As more information around PFAS emerged in subsequent months, public interest shifted and expanded. What follows are the broad categories of questions encountered by HRWC and the answers we have provided.

Question: What are PFAS?

Answer: PFAS are toxic, synthetic chemicals. PFAS is an acronym that stands for perfluoroalkyl and polyfluoroalkyl substances and covers a family of about 3000 similar contaminants. PFAS includes chemicals commonly discussed in the media such as perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS).

Question: Why are PFAS cause for concern?

Answer: Exposure to PFAS is associated with a number of health risks including cancer, increased cholesterol levels, low infant birth weights, liver and kidney dysfunction, and thyroid disorders. PFAS chemicals negatively impact health when they accumulate in the human body over time, or when they are highly concentrated in the food and water we consume.

Question: Where do PFAS come from?

Answer: Common sources in Michigan are believed to be industrial manufacturing sites and places where fire suppression foam has been discharged, like military bases and fire stations. PFAS are used everywhere and are polluting water throughout Michigan and around the country. They are present in hundreds of everyday consumer products such as food packaging, non-stick cookware, carpets and upholstery, waxes, outdoor apparel, and even dental floss.

Question: Are PFAS banned? Regulated?

Answer: Unfortunately, PFAS chemicals are not banned. As of 2022, there is currently no federal regulation limiting PFAS pollution. The EPA has only issued advisory guidelines and has proposed a Significant New Use rule. If accepted, the rule would require new or resumed uses of PFAS to be reported, but it would not regulate use. On the state level in Michigan, there are limits only on the concentrations of PFAS that can be present in drinking water or discharged into the environment, and those rules apply to just seven specific PFAS compounds.

Question: Where does my water come from?

Answer: To answer this question, residents of the Huron River watershed can visit the Maps page of our website (HRWC.org/maps)

Question: Is my drinking water safe?

Answer: As of April 2022, all public drinking water in the watershed is compliant with state law and federal guidelines, including more recent drinking water standards established in 2020.

Ann Arbor's drinking water is treated for PFAS. Many of the specifically regulated PFAS chemicals have been undetectable for months in treated drinking water. Others are well within state standards.

As of 2022, PFAS have not been detected at significant levels in municipal wells within the Huron River watershed. Private residential wells in specific areas near known PFAS contamination sites may be at risk, and state officials have reached out to potentially affected residents.

Question: How does Ann Arbor monitor and remove PFAS from drinking water?

Answer: Ann Arbor is the only community that draws surface water from the Huron River for drinking water; PFAS levels in the water supply have been well below the current EPA Health Advisory Level of 70 parts per trillion (ppt) since reliable test results have been available. EGLE Test results since 2020 indicate that PFOS/PFOA levels in the city's drinking water are low and often undetectable. The City of Ann Arbor tests both finished drinking water and its river source water for PFAS monthly. Regular updates are provided to the public.

The city is also experimenting with ways to remove PFAS from drinking water. Currently, granular activated carbon (GAC) filtration is one of the best available technologies for removing PFAS in drinking water on municipal scales. The city has GAC filters in place and, since November of 2017, has been piloting a new type of carbon in several of its filters. This new carbon has demonstrated enhanced removal of PFAS. Based on that success, city staff presented a proposal to the Ann Arbor City Council in

September 2021 to replace all older carbon in GAC filters with the new type of carbon.

In fiscal year 2019, the total cost to replace GAC in the filters and treat for PFAS chemicals was approximately \$1 million.

Question: What should I do if I'm on a private well?

Answer: Residents with private wells should contact their county health department. The State of Michigan has also provided guidance on residential well water testing at <https://www.michigan.gov/pfasresponse/faq/categories/pfas-and-residential-well-water>

Question: Is it safe to eat fish from the Huron River?

Answer: Along most of the Huron River, it's still not safe to eat fish from the Huron River. Fish tested throughout the Huron may be contaminated with high levels of PFAS. In 2018, the Michigan Department of Health and Human Services (MDHHS) issued a "Do Not Eat Fish" advisory due to PFAS contamination for the Huron River from the N. Wixom Road crossing in Milford to Lake Erie. While the advisory did not specifically apply to tributaries along the Huron River, HRWC is advising that fish should not be eaten from connecting lakes and creeks unless there is a significant barrier to fish. Areas above the Hi-Land Lake Dam on Portage Creek will be safe from the advisory, for example. In 2022, MDHHS relaxed the advisory for the section of the Huron from I-275 to Lake Erie. Please refer to Michigan's Eat Safe Fish guidebook to see what advisories are in place for the lake or stream you intend to fish.

Question: Doesn't the EPA protect residents from contaminated drinking water?

Answer: While it's reassuring that PFAS levels in most Michigan communities are well below the EPA advisory level, numerous state, federal, and academic institutions have determined that the 70 ppt standard should be lowered significantly. Many states, including Michigan, have already done so. Currently, Michigan regulates seven specific PFAS chemicals. PFOS and PFOA are regulated to 16 ppt and 8 ppt respectively, well below EPA guidance levels.

12. REFLECTION, DISCUSSION AND RECOMMENDED

Policy Changes

Based on HRWC's experience addressing PFAS contamination in our watershed and after consultation with legal and scientific experts, we recommend pursuing the following broad policies to protect communities from PFAS and other toxic chemicals.

12.1 Timely Communication from State Agencies with Potentially Affected Residents

Following the discovery of PFAS emanating from the Cherry Capital Airport in the Traverse City area, it came to light that the airport had been notified of the site investigation eight months before residents in the path of the contamination were told. During that eight-month time frame, local experts and residents could have been asking questions, informing the site investigation, and preparing for the possibility that some of their own wells would be affected, as was the case. The public backlash that followed was documented in local and statewide media.³⁶

This delay between notifying the source of pollution (the polluter) and notifying potentially affected residents was also observed at other sites across the state, including in the Huron River watershed. MPART defended this practice as following standard procedure, which was accurate. The existing protocol is to notify polluters at the onset of a state investigation of the site, but to alert residents only *after* contamination has been found to have an effect.

State officials initially did not acknowledge the logical failure of the protocol, the risks it created for residents, or that that the protocol benefits polluters while leaving residents uninformed. Some state officials were reluctant to change the procedure, but later softened their position.³⁷

Several community members provided comments during following Citizens Advisory Workgroup meetings or during other public forums. After several months of discussion with MPART and state officials, the CAWG, and with HRWC staff in its membership,

submitted a memo detailing the unanimous recommendation to remove delays in communicating risks to potentially affected residents.

Among other recommendations, the memo made clear that:

“EGLE/MPART should notify the public of all PFAS Investigations with the potential to impact any household or other water supply, body of surface water, or other exposure pathway. This notification must be provided at the beginning of any investigation or any current investigation. Direct notification at a minimum must be given to local units of government and potentially impacted households and individuals.”

Note the recommendations submitted by CAWG are limited to PFAS investigations, but the same changes in protocol could logically apply to all contaminated site investigations in the state.

MPART reviewed and after additional deliberation with CAWG members, requested CAWG members describe the specific changes and preferred actions they wanted by working through hypothetical scenarios. Several CAWG members participated in the PFAS contamination scenario exercise, and later presented their detailed requests to MPART. MPART and EGLE once again seemed reluctant to implement the changes and reluctant to explain why the changes could not be made.

12.2 Class-based PFAS Protections

Most major producers have voluntarily phased out PFOS and PFOA (the two PFAS for which the EPA has provided guidance in the U.S. since approximately 2015). However, some U.S. manufacturers continue to make them, as do other companies from overseas.

Despite PFOS and PFOA being less readily available to potential users, the scope and magnitude of PFAS contamination has worsened. In the past two decades, the number of other PFAS chemicals in use has grown dramatically, and a rapidly growing body of scientific research is further demonstrating the overlapping and cumulative health effects of many PFAS chemicals.

As states regulate specific PFAS chemicals and public awareness grows around those

specific contamination issues, chemical manufacturers continue to skirt regulations by developing closely related PFAS chemicals to replace the banned substances. Many of these compounds may have similar or worse health effects than the chemicals they are replacing.

There are currently thousands of PFAS chemicals, with more being developed. What's more, PFAS chemicals never occur alone. The processes used to manufacture them create complex mixtures within products, the environment, and human beings. Developing analytical methods for detecting and differentiating among thousands of different PFAS is a slow process, and one that is likely delaying scrutiny of other PFAS chemicals.

Most states, including Michigan, have regulatory frameworks that are woefully inadequate for assessing the safety of each compound in a timely manner. Regulating one chemical or a few at a time is illogical and inefficient, to the point that it endangers both people and the environment.

At the current rate of review, following Michigan or EPA procedures, it will take centuries to evaluate each individual chemical separately. The EPA has recently grouped PFAS into several subclasses with the intention of speeding up the review process; but even in a best-case scenario, this would still result in a decades-long assessment of the entire PFAS class.

Manufacturers of PFAS chemicals have an enormous financial interest in pushing for a slow, chemical-by-chemical regulatory approach that requires decades for each substance. This makes it extremely unlikely that hundreds of PFAS chemicals being actively used today will ever be regulated. Having regulatory agencies evaluate and restrict even a few specific chemicals will consume the regulators' resources and limit public involvement. Currently, manufacturers can create new PFAS chemicals faster than the existing compounds can be regulated.

The federal government has been slow, and at times has even obstructed, solutions to the PFAS crisis. Federal agencies have failed to set a single drinking water regulation or

establish any other enforceable protection from PFAS.

Given all these facts, the only logical way to protect people sufficiently from a class of similar PFAS chemicals with similar health effects is to regulate all PFAS chemicals together, as a class.

Based on emerging research that shows the similar health effects of many short-chain PFAS commonly used as replacements for long-chain PFAS, we believe that short-chain PFAS should be similarly grouped. Considering PFAS as a single group or class will bring faster public health protections. Also, the class approach should be straightforward since the precedent has already been set by EPA.³⁸

12.3 Halt Nonessential PFAS Use

PFAS chemicals are big business. They are used in making common household products such as nonstick pans, stain-resistant fabrics, waterproof clothing, fast-food wrappers, microwave popcorn bags, cosmetics, and even some dental floss. Many of these products create a direct risk of exposure to PFAS. The chemicals are also used in a large number of products that pose less of a direct exposure risk to humans but still introduce PFAS into the environment. Examples include mechanical lubricants, home siding materials, and commercial and industrial tarps. Because PFAS take a very long time to break down, they are absorbed by wildlife and plants, dumped in landfills, and cycle back through the environment where they can affect people.

Most current uses of PFAS are nonessential. In many cases, PFAS are used only to provide a measure of convenience, such as with nonstick pans. The easiest and most cost-effective way for states and communities to reduce PFAS dispersion into the environment is by banning their use in situations that do not compromise safety. Cleaning up existing contaminated sites in Michigan and across the country will be a massive undertaking and one that is extremely costly to taxpayers. Allowing additional PFAS into the environment will only prolong those efforts, making it even more difficult to safeguard human health and even more expensive to clean up.

12.3.1 Selected Examples in State Law

The State of Maine recently passed a law banning almost all PFAS use.³⁹ The law, H.P. 1113 - L.D. 1503, An Act To Stop Perfluoroalkyl and Polyfluoroalkyl Substances Pollution, is a strong model for other states to follow. According to the law, persons and entities "may not sell, offer for sale or distribute for sale" products where PFAS has been "intentionally added" except in cases of "unavoidable use."

The State of Minnesota recently banned PFAS in food packaging, a measure that reduces direct exposure risk due to ingestion and will help remove PFAS from the global cycle by reducing PFAS in waste packaging.⁴⁰

The State of Connecticut recently banned the use of PFAS in fire-fighting foam and in food packaging.⁴¹

12.4 Stronger Polluter Accountability and Enforcement of Cleanups

Background

In the past, Michigan had some of the strongest environmental protections in the United States. Michigan's laws were an example for lawmakers in other states on how to construct strong policies that protect water resources from pollution.

In 1990, the Michigan State Legislature put strict liability standards in place. These laws reflected the standard of most laws in which owners must address harm emanating from their property to adjacent resources or properties. Regardless of how the problem arose, it was the property owner's responsibility to clean it up. Colloquially, this approach was referred to as "polluter pay." It imposed predictable and enforceable liability standards on those who dumped, released or discharged toxic chemicals into the air, water and soil.

In 1995, that began to change when the state legislature, with support from Governor

John Engler and pressure from corporate lobbyists, weakened “polluter pay” protections. These changes marked a shift toward a "causation standard," which placed the burden on the state to prove that contamination or other damage to resources and properties was caused by a particular property owner or operator.

A classic example would be one in which the sole user of a toxic chemical in a given area is found to have contamination in their soil and groundwater, and in nearby waterways. Despite the lack of any other reasonable source, a causation standard requires the state to demonstrate that the pollution came directly from that user at the time the contamination occurred. This leaves the state with far fewer options for enforcement. Often, by the time the full extent of the damage has become public knowledge, those responsible have declared bankruptcy or departed, further reducing the opportunities to hold polluters accountable.

The Situation Today

Current laws continue to allow polluters to pollute or leave pollution in soil and waterways, especially in cases where exposure could be limited by restricting access or erecting physical barriers. The laws also give polluters an advantage as to when legal challenges arise.

The state can order a polluter to investigate their own pollution. The polluter can then refuse, thereby forcing the state to conduct the investigation unilaterally—a process that takes months, if not years, of notification and negotiation. All the while, the pollution can continue. Once the state collects enough data to file suit, the polluter can fight the accusations in court. However, with limited legal resources and laws tilted in favor of polluters, the cases often drag on for years, and state agencies settle for the polluter's compliance, recouping a small fraction of the actual cost of enforcement and cleanup.

Attrition has become the default strategy of polluters throughout Michigan. Since the weakening of “polluter pay” laws to causal liability standards, the number of contaminated sites in the state has increased by orders of magnitude.

Causal liability standards ignore the fundamental rights of Michigan residents to waterways. State waters are owned by the citizens of that state and are not to be used at the discretion of polluters. Causal liability standards also ignore the complexity of how contamination migrates through ecosystems.

Many regulatory changes have occurred since the 1990s, some due to procedural alterations to statutes, legislation, or court decisions. The overall trajectory of these changes has been to weaken protections from pollution and to construct protocols centered on a fundamentally weak system. For instance, current laws allow regulators to adopt “prohibition zones” that prevent exposure to polluted resources by keeping people from using contaminated water rather than requiring cleanup of the pollution.

Allowing polluters to focus only on limiting current exposure to the contamination is detrimental to long-term public health and ecosystem vitality. That is especially true in the case of persistent chemicals like PFAS. The policy leaves a legacy of toxic pollution for future generations and assures that short-term spikes in concentration levels will persist in the environment.

A Local Example



Tribar Manufacturing, Wixom, MI

The Industrial Pretreatment Program (IPP) allows private industrial polluters to effectively hide behind lengthy compliance procedures and subjective enforcement, despite methodologies based on objective measurements. This has been the case in the Huron River watershed, where Tribar Manufacturing and the Wixom wastewater

treatment plant submit regular monitoring results for PFAS in their effluent to EGLE, following the IPP PFAS Initiative and state law. PFAS levels in the effluent have occasionally exceeded long-term compliance levels. Regulators insist they are following protocol, but the protocol as it exists allows for continuing contamination and potential risk to environmental health down river. As long as Tribar submits reports on time and regulators overseeing the site determine that progress is being made, the State is unlikely to pursue additional regulatory enforcement or legal action.

Recommendations:

Based on consultations with environmental law experts, HRWC believes the following changes are required to address the current weaknesses in state law and methodology:

1. To address the inadequacies and shortfalls of the IPP, municipal wastewater treatment plans should work with their local governments to update local limits and reach settlement agreements with polluters. Specific, quantified, and enforceable limits should be included in NPDES permits going forward. Also, the methodology used by the IPP and included in local limits should set short-term maximum limits that are *below* the allowable levels in long-term averages for compliance.
2. To address broad weaknesses in enforcement of cleanups and remediation activities, HRWC supports establishing regulations that return to strict liability standards and give EGLE better tools for holding polluters accountable. Stronger regulations will make it easier to properly clean up PFAS-contaminated sites and will encourage companies to protect their neighbors' health.

ACKNOWLEDGEMENTS

Many of the activities completed by HRWC since 2019—and much of the work detailed above—have been made possible by support from the Frederick S. Upton Foundation. Their generosity has been critical in helping our organization navigate an emerging threat to the watershed.

PFAS contamination is an issue that requires a broad network of partners, each of them contributing deep knowledge on specific subjects. In Michigan and in the Great Lakes region, we are fortunate to have numerous organizations and academic institutions working for the common good and the protection of residents. Since 2018, many of those groups and individuals have provided valuable expertise to HRWC.

While certainly not a complete list, the following entities have been instrumental in advancing PFAS action in Michigan and have provided direct support for our mission:

- ❖ City of Ann Arbor
- ❖ Ecology Center
- ❖ Environment Michigan
- ❖ Environmental Working Group (EWG)
- ❖ For the Love of Water (FLOW)
- ❖ Great Lakes Environmental Law Center (GLELC)
- ❖ Huron-Clinton Metropolitan Authority (HCMA)
- ❖ Michigan Environmental Council (MEC)
- ❖ Michigan Department of Health and Human Services (MDHHS)
- ❖ Michigan PFAS Action Response Team (MPART)
- ❖ Michigan Department of Natural Resources (MDNR)
- ❖ Michigan Department of Environment, Great Lakes, and Energy (EGLE)
- ❖ Michigan League of Conservation Voters (LCV)
- ❖ National Wildlife Federation-Great Lakes
- ❖ Need Our Water (NOW)
- ❖ Natural Resources Defense Council (NRDC)
- ❖ PFAS Alliance

Addressing PFAS Contamination in the Huron River Watershed

- ❖ University of Michigan Environmental Law and Sustainability Clinic
- ❖ Village of Milford
- ❖ Washtenaw County Public Health Department
- ❖ Washtenaw County Water Resources Commission

APPENDIX: PFAS SITES IN MICHIGAN AND AREAS OF CONCERN

PFAS sites within the Huron River watershed are broadly indicative of the contaminated sites found throughout Michigan and other states, with the noteworthy exception of the Huron River watershed, which is not home to a military base. Industrial manufacturers, particularly those that specialize in smooth finishes such as chrome plating, are common PFAS sites. Landfills and automotive/industrial parts manufacturers are also locations where PFAS contamination is commonly found along with other harmful chemicals.

Watershed Investigation: City of Ann Arbor, Wixom Wastewater Treatment Plant, Tribar Manufacturing (Adept Plastic Finishing)

Tribar Manufacturing, also known as Adept Plastic Finishing, is a major source of PFAS pollution in the Huron River. Contamination from Tribar, discharged through the Wixom wastewater treatment plant and into Norton Creek, was found to be the major contributor to contamination in fish, resulting in a Do Not Eat Fish advisory for most of the Huron River.

Contamination of the river caused by Tribar and other sources was first discovered in Ann Arbor's raw and treated drinking water in 2018. Since then, both Ann Arbor and Tribar have installed filtration systems that have dramatically reduced the volume and concentration of PFAS contamination in the river and in the city's treated drinking water. It's worth noting that the drinking water has not exceeded state or federal standards since 2018, for as long as consistent measurements have been taken.

PFAS Site: RACER (Revitalizing Auto Communities Environmental Response Trust)-Willow Run

Location: Willow Run Airport, Van Buren Charter Township, and Willow Run Creek

Description: RACER-Willow Run began its industrial life in 1941 as a bomber plant built

by Ford for the Department of the Army. Operations primarily included machining, cleaning, painting, and assembly of metal parts and products for war armaments and automotive transmissions. The plant is located at 2930 Ecorse Road in Ypsilanti Township.

Since 1980, the site has been regulated as a facility under the Resource Conservation and Recovery Act (RCRA). Because the former factory discharges wastewater to the Ypsilanti Community Utility Authority (YCUA) wastewater treatment plant, PFAS was sampled in accordance with the YCUA Industrial Pre-Treatment Program.

RACER-Willow Run currently discharges water to the pre-treatment program, which is regularly audited by EGLE to verify compliance with appropriate regulations. The RACER Trust and EGLE are continuing to conduct studies of the area until a solution is determined.

Although surrounding residents are on municipal water sourced from the Great Lakes, some private drinking water wells are located north (up-gradient) of the facility. To date, no residential or commercial drinking water wells have been identified as being threatened by groundwater contamination. However, restrictive covenants for the facility are in place which prevent groundwater from being used as a source for drinking water on site.

PFAS Site: Thermofil

Location: 6150 Whitmore Lake Road, Brighton, and area to the SSW

Description: This property was developed in 1955 by Haigh Manufacturing Company as a metal stamping operation. From 1977 to 1982, the site was occupied by ITT-United Plastics, which molded and painted plastics. Thermofil purchased the property from ITT in 1982 and operated the facility as a custom reinforced plastic compounding business. During process operations, a resin was blended onsite with agents such as fiberglass, talc, mica, and flame-retardants. This blended material was then transformed into pellets, a process that involved the addition of flame-retardants. (PFAS is used during

the creation of plastics to keep the material from sticking to the mold.) During a large fire in 1997, plastics stored at the facility burned. There are no reports of fire-fighting foam being used.

EGLE has conducted previous investigations at the facility associated with a trichloroethylene (TCE) groundwater contaminant plume extending approximately 2,000 feet in a southeast direction from the facility, into a residential area, and towards the Huron River.

Results from January 5, 2021 tests conducted by EGLE indicate soil and groundwater impacts both on and off site. In groundwater, contamination was found as high as 790 ppt PFOA, 330 ppt PFOS, and 61 ppt PFHxS at a sample location on the west side of a detention basin at the site.

This property is located within Starlight Mobile Home Park's wellhead protection area; EGLE has not detected PFAS in that water supply. The immediate area surrounding the facility is on municipal water supplied by the City of Brighton and outside this area. However, private wells remaining in the wellhead protection area are outside of the current detection area.

PFAS Site: Former Chrysler Scio Introl Division Site

Location: 2880 Zeeb Road, Dexter, and the Huron River

Description: Located on the Huron River, the former Chrysler Scio Introl Division facility was initially a Chrysler manufacturing plant that specialized in plating and other operations related to the auto industry. Currently, the facility is regulated as a hazardous waste treatment, storage, and disposal facility and is required to conduct actions to eliminate any potential exposures to contamination at the site. Such corrective actions have been ongoing for approximately 10 years. In 2018, PFAS was detected, with results below the 70 ppt criteria. Further investigation in 2019 detected concentrations above 70 ppt on the portion of the site furthest away from the river.

Groundwater flows to the south/southeast, toward the Huron River. The City of Ann

Arbor uses water from the Huron as part of its drinking water supply, and an intake is located downstream, approximately four miles from the site. The next steps of the investigation include additional monitoring and an initial feasibility assessment of potential remediation alternatives.

The on-site supply well has been tested multiple times, with recent tests showing PFOA concentrations below the drinking water standard of 8 ppt. No other PFAS compounds have been detected.

All on-site contamination appears to be venting to the Huron River. However, out of an abundance of caution, the local health department sampled six nearby residential wells during the week of September 21, 2020. The results showed four wells with no PFAS compounds detected, and two wells with very low levels of PFAS compounds detected, substantially below drinking water criteria and likely unrelated to impacts from the Chrysler Scio site.

PFAS Site: Hi-Mill Manufacturing Superfund Site

Location: 1704 Highland Road (M-59), Highland

Description: The Hi-Mill Manufacturing Superfund Site is an active industrial facility that encompasses 4.5 acres. Hi-Mill began manufacturing tubular aluminum, brass, copper tubing, and other parts in 1946. Highland Township, a suburb of Detroit, has a population of approximately 20,000 people, and roughly 3,700 of the residents are served by community water supplies, with the remainder relying on private wells for their drinking water.

The process wastewater from these operations was discharged to two unlined lagoons until 1981 when a wastewater recycling system became operational and the company discontinued discharging to the lagoons. During the time they were in use, the lagoons often overflowed directly into the adjacent wetland in the Highland State Recreation Area and contaminated the wetland water and sediments.

For a brief period of time afterwards, in an effort to dewater the lagoons, the Hi-Mill

Manufacturing Company used roof-mounted sprayers to pump and evaporate water remaining in the lagoons. In November and December of 1983, the lagoons were excavated, the sludge was disposed of, and the lagoons were backfilled.

Contaminants of concern at the Hi-Mill Site are Volatile Organic Compounds (VOCs) in groundwater. Because this is a Superfund site, the EPA is the project lead.

Groundwater flow varies slightly in each of the three aquifers present at the Hi-Mill Manufacturing site. These aquifers are essentially zones of water. Groundwater generally exhibits a radial flow in the shallow aquifer, to the southwest in the intermediate aquifer, and limited information suggests a southwesterly flow in the deep aquifer.

The closest receptor identified near the site is municipal drinking water, although the nearest municipal well is 3,000 feet away and there are no residential wells near the site. The municipal wells were sampled in 2018, with no PFAS detected. Several surface water bodies near the site have not been fully evaluated, but groundwater results near these locations show minimal impact.

In September 2019, PFAS was sampled from select monitoring wells across the site. At that time, two of the wells had detections of PFAS, both with PFOA concentrations above 8 ppt.

In the fifth of its Five-Year Reviews, EGLE is providing recommendations for the inclusion of PFAS sampling in the site groundwater monitoring plan.

No residential wells are located near the site.

PFAS Site: Michigan Seamless Tube, LLC

Location: 400 McMunn St, South Lyon

Description: PFAS sampling completed in 2019 showed exceedances in two monitoring wells. The groundwater flow direction is southwest, toward Yerkes Drain. No residential well sampling is scheduled at this time.

Company officials from Michigan Seamless Tube have requested that the City of South Lyon ban water wells on land adjacent to its plant.

PFAS Site: Wayne Disposal Site 1 Landfill

Location: 49350 North I-94 Service Drive, Van Buren Charter Township

Description: Wayne Disposal Site 1 Landfill is an old, closed landfill currently owned by US Ecology (USE) and adjacent to the currently operational Wayne Disposal Hazardous Waste Landfill, also owned by USE. The landfill has a natural clay liner and has been retrofitted with a series of pumping wells that serve as the leachate collection system.

Because the facility had been operational prior to any hazardous waste regulations, and was known to have accepted both industrial and municipal waste, PFAS was determined to be potentially present. Therefore, samples of both landfill leachate and groundwater were collected and analyzed for PFAS in 2019. In addition, leachate from the landfill—which continues to be collected and sent to an off-site WWTP for treatment—is being addressed separately from the groundwater outside the landfill.

Site geology/hydrogeology consists of a surficial sand unit approximately 15 to 20 feet thick that overlies a clay layer approximately 50 to 60 feet in thickness. Below the clay is a silt/fine sand unit that extends to bedrock. Groundwater is present in both the surficial sand unit and the silt/fine sand unit below the clay. It should be noted that, due to landfill construction, the surficial sand unit has been physically removed at some locations.

The site is located in the Huron River watershed. Specifically, the Huron River is located south of the facility, and groundwater flow is generally to the south towards the Huron River. In the areas where PFAS was detected, flow in the shallow sand unit is assumed to be to the south toward a local creek that is a tributary to the Huron River, although limited information is available to confirm this assumption.

On February 15, 2019, Wayne Disposal's contractor, Golder Associates Inc., collected groundwater samples at monitoring wells. The highest groundwater result was 30 ppt

PFOA, with one well registering PFBA of 20 ppt.

PFAS sampling was conducted as part of the overall corrective activities at the facility. EGLE will mandate additional steps regarding PFAS delineation and fate/transport from the facility.

The closest known residential well, according to EGLE, is in an aquifer located deeper than the site contamination. EGLE is working with the local health department to determine whether any other residential wells are nearby.

PFAS Site: Werkner Road Landfill

Location: 8027 Werkner Road, Chelsea

Description: Werkner Road Landfill is a solid waste facility. PFAS testing was conducted due to a MPART landfill initiative, with samples collected from six monitor wells and a leachate pond. The pond is located near the center of the landfill property, and leachate is pumped out and disposed of as needed.

Potential effects: Because the contamination is shallow and nearby residential wells are side-gradient, up-gradient, and screened at a lower depth, residential wells are unlikely to be impacted.

On June 19, 2019, Werkner Road Landfill's contractor, Soil and Materials Engineers, Inc. (SME), conducted PFAS sampling of six monitor wells and the leachate pond. One monitoring well sample exceeded the EGLE criteria for PFOA, with the highest PFOA result being 54 ppt.

EGLE staff will recommend quarterly PFAS monitoring as part of the site remediation action plan. In addition, EGLE is working with local health department staff to determine if there are any nearby residential wells.

PFAS Site: Brighton Township Dump

Location: Corlett Drive, Brighton Township

Description: This historic dump accepted waste materials during the 1960s and into the early 1970s. The facility was closed in 1973 without covering or removing wastes. Since then, the EPA has removed approximately 200 drums and 450 cubic yards of visibly contaminated soil from a ravine near the center of the facility.

In 1996, monitoring wells were installed using state funds. In 2002, the State of Michigan removed highly contaminated soil bordering the south wetland. In 2009, the state entered into a consent decree with Brighton Township. Under the terms of the decree, the township agreed to pay a portion of past costs incurred by Michigan, in exchange for which the state would conduct response activities at the dump. These activities would include monitoring of methane, monitoring of well groundwater sampling, and annual sampling of residential wells near the dump for a ten-year period, if performance objectives were met. The consent decree did not provide for response activities to address emerging contaminants such as PFAS.

Potential effects: Monitoring continues at this site near the wetlands and the residential well on the adjacent property. Nine residential wells surround the landfill. One is located near two monitoring wells where PFOA and PFOS were detected.

PFOS was detected below criteria in both the shallow and deep monitoring wells. In addition, PFOA and PFOS have been detected in five monitoring wells. The highest concentration of PFOA was 26 ppt, and the highest concentration of PFOS was 18 ppt, both of which exceed Part 201 criteria. The highest concentration of combined PFAS was 110.4 ppt. A geologic review is in progress to determine which monitoring wells EGLE should sample for PFAS as part of the next phase of the investigation.

On July 21, 2020, the consultant for Brighton Township sent the results of PFAS sampling conducted by EGLE to a homeowner with a residential well near two monitoring wells where PFAS was detected. The Livingston County Health Department was also informed of the PFAS results.

As a next step, EGLE will complete a geologic review to determine which monitoring wells should be sampled. The department will also request that Brighton Township collect a residential well sample from the residence closest to the monitoring wells where PFOA and PFOS were detected.

Residential Well Testing/Alternate Water Information

There is justifiable concern at this site regarding residential wells. Through much of 2020 and 2021, communications with nearby landowners regarding this site were ineffective.

Residential wells draw water from sand and gravel deposits and are deeper than the monitoring wells. Clay layers identified in well logs may be protective of the aquifer where potable wells are set. EGLE is currently working with the local health department to test nearby residential wells.

PFAS Site: 1279 Rickett Road

Location: 1279 Rickett Road, Brighton

Description: From at least 1985 until 2020, this site has generally been occupied by fluid coupling, fabrication, engineering, and metal coating and finishing operations. A baseline environmental assessment (BEA) for the site was submitted to EGLE in August 2020. (Conducting a BEA enables an individual to acquire or begin operating at a facility without being held liable for existing contamination.) Soil and groundwater samples collected in April and May 2020 included results for PFAS.

Because only temporary monitoring wells were installed for sample collection at the property, no site-specific data on groundwater flow is available. To date, permanent monitoring wells have not been installed. Groundwater flow direction inferences by the Michigan Geological Survey suggest groundwater flow to the south-southwest. On-site shallow groundwater contamination trends may indicate groundwater flow to the south-southeast. The nearest surface water body is Fonda Lake, approximately three-quarters of a mile east of the site. Residential wells are located south of this facility.

EGLE, Michigan Department of Human Health Services, and the Livingston County Health Department all reviewed drinking water well records to identify potential wells for sampling. Subsequently, private parties installed, developed, and surveyed eight monitoring wells in shallow groundwater on the 1279 Rickett Road property.

In late October 2020, EGLE contacted nearby residents by mail, requesting permission to collect residential well samples for PFAS analysis.

At present, a private party is developing a scope of work to investigate the PFAS groundwater contamination on the property, and the sampling of residential wells is pending.

PFAS Site: Brighton Waste Water Plant

Location: 6570 Hamburg Road, Brighton

Description: In 2019, EGLE collected effluent samples from the Brighton WWTP. Results from these samples were 11 ppt for PFOS and 19 ppt for PFOA.

PFAS Site: Heritage Apartments

Location: 2375 S Commerce Road, Wolverine Lake

Description: Total tested PFAS was 36 ppt, and PFOA + PFOS was not detected. At present, no action is being taken because the State reports that the chemicals detected are not among those regulated.

PFAS Site: Glengary Elementary School

Location: 3070 Woodbury Street, Commerce Charter Township

Description: In June of 2018, the sampled value of total PFAS was 77 ppt, and PFOA + PFOS was 20 ppt.

School administrators placed a bottled water dispenser near the entrance as a temporary solution, and the school is in the process of being connected to municipal drinking water sources.

PFAS Site: Emerson School

Location: 5425 Scio Church Road, Ann Arbor

Description: In July of 2018, EGLE samples found total PFAS of 14 ppt in Emerson School drinking water. The levels for regulated chemicals were undetected.

The school initially began distributing bottled water until filtration systems could be installed.

Potential PFAS Site: Portage and Little Portage Lakes

Location: Portage and Little Portage Lakes along Dexter-Pinckney Road and McGregor Road, Dexter

Description: Suspicious foam has been reported in the vicinity of Portage and Little Portage Lakes periodically since 2019. EGLE officials have investigated the area and collected surface water samples. However, neither elevated PFAS levels nor PFAS foam could be confirmed.

Potential effects: Residents are advised to avoid foam on both the Chain of Lakes and the river. The substance reported often has the characteristics of PFAS foam, but since elevated levels have not been found and no consistent source can be identified in the area, no immediate risks are known.

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²⁷ Ann Arbor treated and raw source drinking water PFAS test results: <https://www.a2gov.org/departments/water-treatment/Pages/PFAS-Information.aspx>

²⁸ EGLE [Pollution spill form](#).

²⁹ [What to Do if you Find Suspicious Foam - Huron River Watershed Council \(hrwc.org\)](#) <https://www.hrwc.org/what-to-do-if-you-find-suspicious-foam/>

³⁰ [Summary-Huron-River-Economic-Impact-web.pdf \(hrwc.org\)](#) <https://www.hrwc.org/wp-content/uploads/2017/10/Summary-Huron-River-Economic-Impact-web.pdf>

³¹ Cleanup Criteria and response activities, colloquially referred to as “Part 201” authorizes EGLE to set cleanup standards by considering how the contaminated land or water will be used in the future. Michigan's cleanup standards are risk-based and reflect the potential for human health or ecological risks from exposure to potentially harmful substances at contamination sites.

³² [Slotkin amendment would help arm Michigan for PFAS battle - mlive.com](#) | <https://www.mlive.com/public-interest/2020/08/slotkin-amendment-would-help-arm-michigan-for-pfas-battle.html>

³³ Health-based Values, also called HBVs, differ from regulatory criteria. HBVs inform risk of human health and can be used to establish Maximum Contaminant Levels. | [PFAS - Overview of Michigan's Screening Values & MCLs](#)

³⁴ [3M to pay \\$55M in Michigan PFAS settlement - mlive.com](#) <https://www.mlive.com/news/2020/02/3m-to-pay-55m-in-michigan-pfas-settlement.html>

³⁵ [3M documents show company knew of PFAS dangers for decades \(freep.com\)](#) <https://www.freep.com/story/news/local/michigan/2019/05/09/3-m-lawsuit-pfas-water-contamination-michigan/3291156002/>

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³⁹ [Maine outlaws PFAS in products with pioneering law..](#) July 2021. <https://www.reuters.com/legal/litigation/maine-outlaws-pfas-products-with-pioneering-law-2021-07-16/>

⁴⁰ [SF 373 Status in the Senate for the 92nd Legislature \(2021 - 2022\) \(mn.gov\)](#) https://www.revisor.mn.gov/bills/text.php?number=SF373&version=latest&session=ls92&session_year=2021&session_number=0

⁴¹ [C G A \(ct.gov\)](#)

The Huron River Watershed Council (HRWC) is a nonprofit coalition of local communities, businesses, and residents established in 1965 to protect and restore the river for healthy and vibrant communities. Services include hands-on citizen education, technical assistance in policy development, and river protection and monitoring projects. HRWC also leads the Huron River Water Trail, a designated National Water Trail.



HRWC * 117 North First Street, Suite 100 * Ann Arbor, MI 48104 * HRWC.org