



Minnesota's PFAS Blueprint

Protecting families and communities from PFAS pollution

m MINNESOTA

Pollution Control Agency

Department of Agriculture

Department of Health

Department of Natural Resources



Managing Minnesota's PFAS problem

Per- and polyfluoroalkyl substances, commonly known as PFAS, are an enormous family of chemicals and now pervasive in the environment. Called “forever chemicals”, they do not breakdown and can bioaccumulate in both humans and other living organisms, with some known to be toxic. Minnesota requires a strategic, coordinated approach to protecting families and communities.

PFAS are everywhere ...

With more than 5,000 structures and over 9,000 identified chemistries, PFAS are present in the environment and will remain so for generations. In Minnesota, the first ‘discovery’ of PFAS contamination occurred in the early 2000s, when drinking water contamination was found in the East Metropolitan area of the Twin Cities. Since then, PFAS have been detected in water, sediment, soil, and fish all across Minnesota—from Duluth and Brainerd to Bde Maka Ska and Pine Island and places in between.

PFAS are used in a wide variety of industrial processes and commercial products. Two of the most studied are perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). PFOS was a key ingredient in the stain repellent Scotchgard and was used in surface coatings for common household items such as carpets, furniture, and waterproof clothing. PFOS was also included in fire-fighting foams used at airports, fuel refineries, and other facilities. PFOA was used in the production of many products, including (but not limited to) nonstick coatings for cookware, coating for carpets, coatings for upholstery, coatings for clothing, floor wax, sealants, and even some dental flosses. While PFOS and PFOA are no longer produced in the US, products containing them are still in circulation in homes and businesses around Minnesota.

PFAS have been detected in air emissions from industrial facilities, wastewater from industrial and municipal sources, soil and water surrounding firefighting training sites, groundwater surrounding landfills, and are sometimes found with no obvious source at all.



... yet we know so little

For nearly two decades, Minnesota state agencies have been working to respond to PFAS and incorporate managing this pollution into their regular research, guidance, and regulatory work. The Minnesota Department of Health (MDH) has developed health-based values for five PFAS (PFOA, PFOS, PFHxS, PFBA and PFBS) and is currently reviewing a sixth (PFHxA). The Minnesota Pollution Control Agency (MPCA) continues working with permit holders and other states to understand the opportunities to reduce the presence of PFAS in both landfill leachate and wastewater, and addressing PFAS at contaminated sites across the state. The MPCA announced in October 2020 new protective water and fish consumption values for PFOS in several Twin Cities metro water bodies, including Bde Maka Ska and Pool 2 of the Mississippi River.

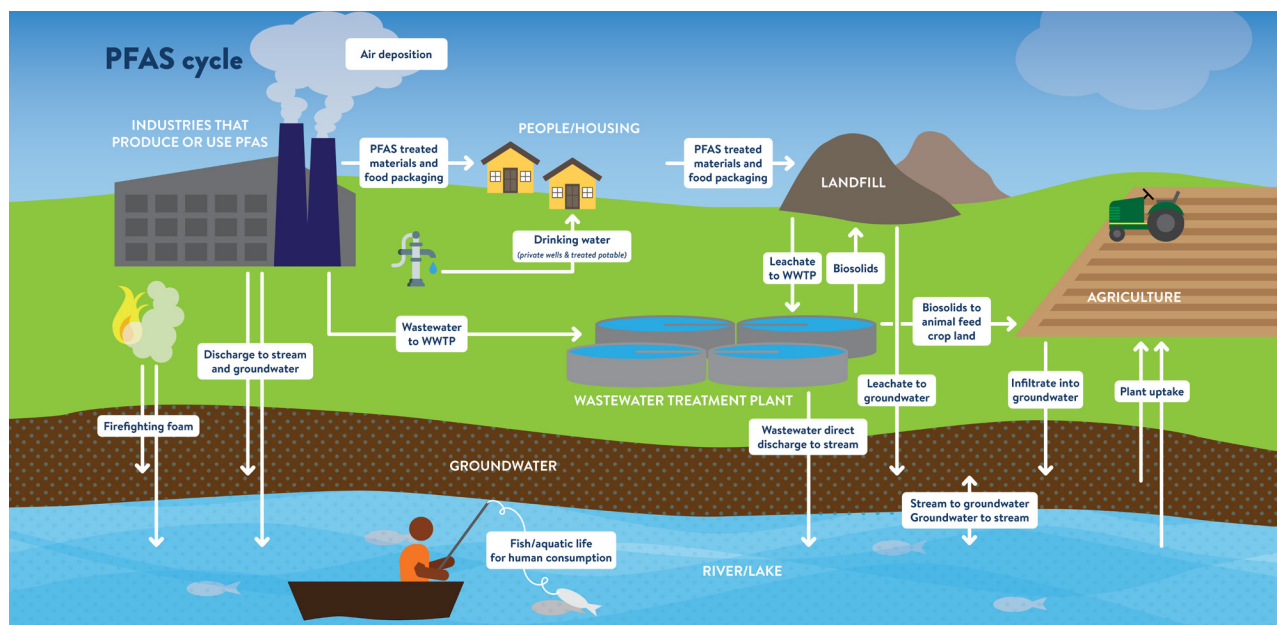
Yet, new PFAS are being invented, used in industry and incorporated into commercial products, and released into the environment every day. A key challenge in understanding and regulating PFAS is identifying their uses, presence in the environment, and impacts on health and ecosystems. Available sampling techniques and established analytical methods characterize less than one percent of all PFAS in the environment.

There are gaps in our understanding of the effects of PFAS on human and environmental health including a lack of toxicity studies available. Without toxicity studies, it is not possible to complete health risk assessments used to determine safe levels of human exposure.

The breadth and diversity of PFAS pollution, coupled with a lack of research on health impacts, complicates the development of regulatory and non-regulatory approaches to managing PFAS.



Currently available sampling and analysis methods can identify less than 1% of all PFAS in the environment.



A coordinated, strategic approach to PFAS

Across the United States, federal and state health and environmental regulators are taking steps to incorporate PFAS into their programs to protect human health and the environment. Scientists and environmental regulators have reached an overwhelming consensus that significant actions are needed to prevent adverse impacts from PFAS. This may include regulatory actions such as pollution standards and limitations on PFAS discharges and emissions to the environment, and cleanups of existing areas of contamination. While management and mitigation actions have significant positive effects, ultimately Minnesota cannot clean our way out of the PFAS problem. Instead, the pollution must be prevented from the outset through restrictions or bans on PFAS uses and assistance and financial support for reformulation.

Minnesota's state agencies have been working to respond to PFAS and incorporate managing this pollution into regular research, guidance, and regulatory and program work. However, efforts have largely been focused on reacting to new PFAS discoveries in Minnesota and specific discrete concerns. While important work has been completed, ongoing resources are needed to allow the agencies to build comprehensive and holistic PFAS programs.



A former disposal site in Oakdale

While management and mitigation actions have significant positive effects, ultimately Minnesota cannot clean our way out of the PFAS problem.

Minnesota's desired strategy for PFAS management



1 Prevent

PFAS pollution wherever possible



2 Manage

PFAS pollution when prevention is not feasible or pollution has already occurred



3 Clean up

PFAS contaminated sites

The costs and burdens of these activities increase from prevention to site clean-ups. Prevention may require large efforts to establish but is relatively easy to maintain. Site clean-ups can be quite costly and time-consuming. The state may play different roles depending on its authorities and the stage of management, including writing regulations to ban or restrict uses, providing technical or financial assistance for pollution prevention, regulating through permitting or other actions, helping educate the public, deriving risk-based values, and leading clean-up efforts.

Identifying 10 priorities to protect communities and families

Working together, Minnesota state agencies developed Minnesota's PFAS Blueprint to support a holistic and systematic approach to address PFAS. Minnesota's PFAS Blueprint provides an in-depth discussion of PFAS concerns in 10 key issue areas. For each issue area, the blueprint outlines many PFAS initiatives taken and underway in Minnesota, and identifies key areas of opportunity for moving forward on managing and addressing PFAS. It is important to highlight the significant interconnections and overlaps between different areas, illustrating the complexity and difficulty of managing PFAS.



Measuring PFAS effectively and consistently

State agencies have developed multiple efforts to ensure consistent and accurate PFAS analytical results. Despite this important work, it is currently impossible to quantitatively measure the vast majority of PFAS in the environment.



Understanding risks from PFAS air emissions

Federal and state governments have not developed PFAS health screening value for air as there is limited research about the toxicity of PFAS from air exposure. Minnesota also has limited information on which facilities emit PFAS to the air.



Quantifying PFAS risk to human health

Risk assessments are needed to ensure that levels of contaminants in the environment are protective of the community's health.



Preventing PFAS pollution

Pollution prevention approaches are designed to reduce exposure to toxic chemicals and prevent the need for expensive treatment and remediation efforts. More work is required to prevent non-essential uses and releases of PFAS.



Limiting PFAS exposure from drinking water

Minnesotans value safe and sufficient drinking water. MDH has planned for, and has ongoing monitoring efforts in place that will cover at least 90 percent of people served by community water systems by 2025.



Limiting PFAS exposure from food

Minnesotans should have confidence that their food is safe from harmful toxins. Research has shown that PFAS can accumulate into produce and livestock from contaminated water, air, soil, and animal feed or migrate into food from PFAS-coated cookware and food packaging.



Reducing PFAS exposure from fish and game consumption

Hunting and fishing are a way of life in Minnesota. Continued research of PFAS in fish and wildlife has indicated that some compounds can accumulate in commonly-consumed fish and game tissue. More work is required to ensure safe consumption of fish and game is maintained for future generations.



Protecting ecosystem health

New research models and tools for ecological risk assessments are being designed for the unique physical and chemical properties of PFAS. Using new data and research, Minnesota can ensure its ecosystems are healthy and diverse.



Remediating PFAS contaminated sites

While state agencies have developed several health-based clean-up values, Minnesota does not have a comprehensive list of PFAS uses in manufacturing and industrial processes and a comprehensive understanding of risks to human health. More information is needed to determine the locations of and risks posed by possible releases of PFAS into the environment.



Managing PFAS in waste

Because of its widespread use in products, PFAS is entering Minnesota's waste streams and going to solid waste facilities and wastewater treatment plants where it is difficult and expensive to address. The most strategic approach to managing PFAS is preventing them from entering waste streams in the first place.

Developing short- and long-term opportunities to manage PFAS

The Minnesota PFAS Blueprint identifies short- and long-term opportunities to manage PFAS in our environment and protect families and communities. Over the coming months and years, state agencies will further develop these strategies and engage Minnesotans on how best to implement them. Some PFAS strategies can be developed by using existing authorities and resources. Many other strategies will require legislative action, including priorities for the 2021 legislative session.

The future needs and opportunities are complex and resource-intensive. State agencies and community partners will need to work together to undertake projects that most strategically advance the collective goal to protect human health and the environment from the impacts of PFAS.

Long-term opportunities identified represent a broad range of strategies, many of which are connected and dependent on each other. The world of understanding and managing PFAS is dynamic, with work being done by other state agencies, federal agencies, academics, and corporations. This work will fill some of the gaps in knowledge, impacting the work that needs to be done in Minnesota. The conversation about long-term opportunities will need to adapt to new information and results. State agencies expect to revisit this blueprint over time to adjust to the changing landscape of managing PFAS.



Legislative action needed in 2021 (immediate needs)

☐ Designating PFAS as hazardous substances

Designating PFAS as hazardous substances will enable a faster, more efficient response to releases of PFAS that threaten drinking water, communities and families. Facilities that generate PFAS pollution will be held accountable for cleaning up contamination. The state and communities will have the tools they need to identify and reduce sources cost effectively.

☐ Requiring companies to disclose information on contaminants

The MPCA would be able to require facilities to submit information on the use of PFAS and other contaminants in products and processes when monitoring shows unexplained presence of contaminants in the environment. With more information, MPCA will be better equipped to work with facilities and communities to reduce pollution at the source through the permitting process, incentives, or pollution prevention.

☐ Identifying sources of PFAS in the environment

PFAS contamination is a complex problem. State agencies need additional and better information to identify potential PFAS sources and prioritize investigations when large amounts of PFAS may have been used, produced, or discarded. A \$700,000 funding request would support a pilot project that would fill a critical data gap in the state's current knowledge of PFAS sources.

- ☐ **Evaluating PFAS waste going to landfills, compost facilities, and wastewater treatment plants**
Minnesota does not have adequate data to evaluate materials entering wastewater and solid waste facilities that result in high levels of PFAS. A two-year funding request of \$500,000 will expedite state agencies' understanding of how waste coming into these facilities is affecting PFAS levels in the water that leaves wastewater and solid waste facilities.
- ☐ **Responding when PFAS are found in closed Minnesota landfills**
When unexpected PFAS contamination is found at a closed Minnesota landfill, the MPCA needs access and funding to protect communities and families.
- ☐ **Protecting Minnesotans from fish contaminated with PFAS**
PFAS has been detected in remote Minnesota waterways and fish tissue. New and ongoing water monitoring is needed to identify the extent of PFAS contamination in Minnesota and to develop safe fish consumption advice. The Governor recommends \$400,000 over the next two years to sample fish and water for PFAS.
- ☐ **Protecting drinking water and agricultural lands by understanding PFAS in wastewater and landfill leachate**
The MPCA is seeking \$1.4 million to better understand impacts of elevated levels of PFAS in wastewater biosolids, compost contact water, and landfill leachate and to evaluate potential treatment options. More information will ensure Minnesota's drinking water is safe and farms are productive.



Short-term considerations for agencies and legislature (within the next two years)

- ☐ Making progress on statewide water quality standards for PFAS-Class 1 drinking water.
- ☐ Creating a plan for monitoring PFAS in groundwater at active landfills.
- ☐ Generating a plan for monitoring PFAS at NPDES permitted facilities.
- ☐ Compiling information on inhalation PFAS toxicity.
- ☐ Developing a plan for performance testing for PFAS at permitted air sources.
- ☐ Issuing guidance on the collection and disposal of PFAS-containing firefighting foam concentrate and wastewater.
- ☐ Researching cutting-edge risk assessment techniques for data-poor PFAS.
- ☐ Updating guidance for recommended compound testing at cleanup sites to include PFAS.



Longer-term considerations (more than two years)

- ☐ Assessing the need for acute wildlife risk assessment from exposure to PFAS-containing foam.
- ☐ Requiring mandatory air toxics, including PFAS, reporting from facilities.
- ☐ Providing financial and technical assistance to businesses for switching from PFAS-containing products.
- ☐ Developing soil to groundwater leaching values for PFAS to be used in cleanups and disposal guidance.
- ☐ Developing an epidemiological study of residents exposed to PFAS through drinking water.
- ☐ Limiting or banning PFAS in known non-essential uses.
- ☐ Assessing the need for developing statewide water quality standards for PFAS-Class 2 aquatic consumption, aquatic life.

A larger and more detailed listing of considerations is available at www.pca.state.mn.us



Pollution Control Agency
Department of Agriculture
Department of Health
Department of Natural Resources