Life Cycle Stage 1: Initial Site Review

Remediation PFAS Guidance

Initial Site Review Goal: Determine whether a site will be evaluated for the presence of a PFAS release

The actions identified in this section expand on those established by the Monitoring Plan and encourage the collection of information and data to adequately determine the presence of PFAS at a site.

During the Initial Site Review, Life Cycle Stage 1, a site's current and historical use of PFAS and proximity to potential PFAS sources will be assessed to determine whether PFAS sampling ("site investigation") may be necessary. The site review process is the same for Superfund, Brownfields, and RCRA programs; however, follow up actions based on the gathered information may differ depending on whether an entity is a responsible party for the PFAS and whether a potential exposure pathway exists at the remediation site. If a site investigation is necessary, appropriate communication and outreach measures should be implemented to ensure that all stakeholders are informed and given the opportunity to participate, where applicable. See the *Communications* and *Environmental Justice* sections for additional information about these areas. The milestones and their corresponding actions described below present the areas to evaluate in determining the possible need for PFAS sampling:

1.1 Initial Site Review Milestone 1: Assess criteria to determine potential need for PFAS sampling at sites in the Remediation Program

1.1.1 Initial Site Review Milestone 1, Action 1: Identify historical and current site use(s)

During the initial site review, the site's current and historical domestic, commercial, and industrial practices will be evaluated. This includes a review of business type(s), operations performed, chemicals handled, chemical disposal practices, hazardous waste records, regulatory history, and any other pertinent information in determining the potential for PFAS contamination at the site. A common format for the initial site review is a Phase I Environmental Site Assessment (ESA), which is described in the ASTM Standard Practice for Environmental Site Assessments (https://www.astm.org/e1527-21.html). Another format for initial site screening can be found in ASTM Standard Guide for Per- and Polyfluoroalkyl Substances Site Screening and Initial Characterization (https://www.astm.org/e3358-23a.html).

PFAS have been widely used in industrial processes and in manufacturing consumer products for several decades. The PFAS Monitoring Plan includes the full list of industry categories associated with potential PFAS use or release in Appendix F. Broadly, these fall under the industry categories, listed in Annex I of this guidance.

A site's current and historical practices should be compared to the full list of industry categories for indication of the potential for PFAS release. Numerical codes have often been assigned to businesses to aid in classification and data collection, namely the Standard Industrial Classification system (SIC codes, used from 1937-1997) and the North American Industry Classification System (NAICS codes, used from 1997-present). However, SIC and NAICS codes are self-reported by businesses, and may not fully capture the range of operations of a business which may change over time. Therefore, while these codes may represent useful pieces of data during the initial review phase, they should not be the only information used to assess a site's potential for a PFAS release. Rather, the industrial practices performed at the site should be compared to the broad list of industry categories

provided above to determine whether a site's use has presented the potential for PFAS release. If a site has a connection to one of these industry categories, a deeper look may be warranted to determine if the specific operations at the site may have used PFAS. For example, a paper mill that produced coated paper or food packaging may be viewed differently than a paper mill that solely produced paper towels or tissues.

The above listed industry categories include major manufacturing and industry sources as well as waste facilities. The MPCA distinguishes between facilities that directly use or have used PFAS in commercial and industrial operations and facilities that are or have been receivers of PFAS waste, such as waste disposal, recycling, or treatment facilities. However, both types of facilities are included in this list as potentially associated with a PFAS release.

PFAS releases from industrial and manufacturing facilities is associated with either the production or use of PFAS in facility operations. PFAS were introduced in manufacturing and commercial production in the 1950s and are generally released via wastewater and stormwater discharges, solid waste disposal, accidental releases such as leaks and spills, and stack emissions.

PFAS releases from solid waste facilities (including municipal solid waste landfills, legacy disposal sites, scrap yards, metal salvage facilities, and unpermitted dumps) is associated with the handling and disposal of PFAS-containing industrial waste or products. Solid waste facilities associated with PFAS-containing industrial waste, sludge, site mitigation waste, and consumer waste and septage are therefore of concern when identifying sources of PFAS. Unlined landfills and legacy disposal sites have a greater likelihood of releasing PFAS to the environment since waste is in direct contact with soil. Most landfills constructed prior to the 1990s were not required to be lined. In addition to industrial operations and waste disposal, PFAS can be released locally by use of aqueous film forming foams (AFFF) (Class B firefighting foams). These have been stored and used for fire suppression and training at defense sites, airports, and industrial facilities, as well as for training and emergency response by community fire departments.

There are unique situations where PFAS may be a concern despite no history of industrial activity at a site. Smaller releases of PFAS may be associated with various commercial and domestic activities involving PFAS-containing products, such as car washing, ski wax use, and apparel laundering. Other examples include using PFAS foam for killing livestock during infectious disease outbreaks and the application of PFAS-containing biosolids in farm fields.

More information about sources of PFAS to the environment can be found from ITRC and the resources provided at the end of this section.

1.1.2 Initial Site Review Milestone 1, Action 2: Identify proximity to potential or known PFAS sources

It is important to identify the presence of potential or known off-site sources of PFAS because of the highly soluble and mobile nature of PFAS. A nearby source of PFAS contamination may pose a risk to receptors at a remediation site (ITRC, 2022). All risk exposure pathways should be considered, including but not limited to drinking water wells, commercial/industrial supply wells, surface water, foam, and sediment. If groundwater is not directly used as a drinking water source at a remediation site, it still may be considered a potential exposure pathway based on secondary uses, such as dewatering activities, sump discharges, and irrigation.

The MPCA recommends starting with a baseline radius of 1,000 feet from the edge of all receptors identified at a Site. Further expansion of the radius may be needed based on factors such as site geology, groundwater flow direction, aquifer sensitivity, receptor characteristics, and types and duration of sources. The ASTM standard suggests using Approximate Minimum Search Distances of 0.5 to 1 mile for reviewing several types of records such as NPL sites and RCRA TSD facilities. The purpose of these search distances for records review is to assess the likelihood of an impact to the subject property from PFAS migrating to the site from areas outside the subject property. Off-site sources that may be of particular concern that may require expansion of the 1,000-foot site radius could include fire training facilities or other AFFF releases, land disposal facilities, and wastewater treatment plants.

Another important consideration in the initial site review is traditional ecological knowledge (TEK) pertaining to the site. TEK is a collection of knowledge held by people in communities with a long history of direct

dependence on local resources. Not only does the information provide valuable context, but local/indigenous names can provide context for where or what to sample. For example, a local place name associated with a remediation site that translates to “to drink” might indicate a potential exposure pathway related to an off-site source and may warrant sampling for PFAS during the investigation stage.

Communication with MPCA program staff is necessary to determine if the off-site source is being evaluated under other programs and what data already exists. If at any point in the review phase it is suspected that a drinking water receptor is at risk for PFAS exposure from on or off-site sources, a receptor evaluation and sampling effort should be conducted as soon as possible to determine if there is confirmed human exposure risk for a drinking water well. See the Investigation life cycle stage for information on conducting the receptor evaluation and determining the need for mitigation.

In summary, the below criteria are important in determining when PFAS sampling may be necessary at a site. This is not an exhaustive list:

- Current or historical land use of the remediation site indicates potential or known use of PFAS. This observation may stem from a combined evaluation of NAICS codes, industry categories, specific operational practices and site activities, land use and zoning regulations, a review of hazardous waste records, such as Safety Data Sheets (SDSs), etc. This information may or may not be identified as Recognized Environmental Conditions (RECs) in a Phase I report.
- Site or nearby sampling results have identified PFAS-impacted media.
- There is a potential risk to site receptors from a known or potential PFAS release from an on-site or off-site source.
- Whether the entity is a responsible party for the PFAS contamination. For nuances related to non-responsible parties, refer to the Brownfield section of this document.

Incoming or new remediation sites may include PFAS sampling in the Phase I or II Environmental Site Assessment (ESA), the Preliminary Assessment (PA)/Site Investigation (SI), or the RCRA RFA/RFI. Existing sites already enrolled in an MPCA Remediation program may need to conduct a full evaluation of the potential for PFAS releases based on re .

Annex I

Table 1-1: Industrial Categories associated with PFAS generation, use, storage, or disposal

- Aviation & aerospace
- Automotive
- Biocides (Herbicides and Pesticides)
- Biotechnology
- Building and Construction
- Cable and Wiring
- Chemical Industry
- Cosmetics/Personal Care Products
- Electronics
- Energy
- Explosives, Propellants, Guns, and Ammunition
- Firefighting/Safety
- Food Processing
- Household and Cleaning Products
- Medical Products
- Metal Plating
- Oil Production
- Mining
- Nuclear Industry
- Oil and Gas Industry
- Paper and Packaging
- Pharmaceutical Industry
- Photographic Industry
- Photolithography & Semiconductor
- Plastics and Rubber
- Recreational and Musical Equipment
- Recycling and Material Recovery
- Refrigerants
- Textiles (Upholstery, Carpets), Leather, and Apparel
- Wood Industry

The above list draws from ITRC PFAS Guidance Table 2-6 Sample historic and current uses of PFAS. Visit the page for more information on the products, uses and types of PFAS.

References and resources

ASTM. 2021. Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. American Society for Testing and Materials. https://www.astm.org/e1527-21.html.

ASTM.2023. Standard Guide for Per- and Polyfluoroalkyl Substances Site Screening and Initial Characterization. American Society for Testing and Materials. https://www.astm.org/e3358-23a.html

Gaines LGT. 2022. Historical and current usage of per- and polyfluoroalkyl substances (PFAS): A literature review. American Journal of Industrial Medicine. 66(5):353–378. doi:10.1002/ajim.23362. https://doi.org/10.1002/ajim.23362.

Glüge J, Scheringer M, Cousins IT, DeWitt JC, Goldenman G, Herzke D, Lohmann R, Ng CA, Trier X, Wang Z. 2020. An overview of the uses of per- and polyfluoroalkyl substances (PFAS). Environmental Science Processes & Impacts. 22(12):2345–2373. doi:10.1039/d0em00291g. https://pubs.rsc.org/en/content/articlelanding/2020/EM/D0EM00291G.

ITRC. Best Practices for Traditional Ecological Knowledge. Interstate Technology and Regulatory Council. https://edm-1.itrcweb.org/traditional-ecological-knowledge-home/

ITRC. 2023. Per-and Polyfluoroalkyl Substances (PFAS). Interstate Technology & Regulatory Council (ITRC) September 2023. https://pfas-1.itrcweb.org/wp-content/uploads/2023/12/Full-PFAS-Guidance-12.11.2023.pdf

ITRC. 2023a. PFAS Uses and Products. Interstate Technology and Regulatory Council. https://pfas-1.itrcweb.org/2-5-pfas-uses/

ITRC. 2023b. PFAS Releases to the Environment. Interstate Technology and Regulatory Council. https://pfas-1.itrcweb.org/2-6-pfas-releases-to-the-environment/#2_6_3

MDH. 2024. Interactive Dashboard for PFAS Testing in Drinking Water. Minnesota Department of Health. https://www.health.state.mn.us/communities/environment/water/pfasmap.html

MPCA. 2022. PFAS Monitoring Plan. Minnesota Pollution Control Agency, March 2022. https://www.pca.state.mn.us/sites/default/files/p-gen1-22b.pdf.

MPCA. Minnesota Geospatial Commons: Land Application Sites in Minnesota. Minnesota Pollution Control Agency. https://gisdata.mn.gov/dataset/env-land-application-sites

MPCA. 2023a. PFAS and closed landfills: Closed landfill sites with PFAS detections. Minnesota Pollution Control Agency. https://www.pca.state.mn.us/air-water-land-climate/pfas-and-closed-landfills.

MPCA. 2023b. PFAS Studies and reports. Minnesota Pollution Control Agency. https://www.pca.state.mn.us/air-water-land-climate/pfas-studies-and-reports

MPCA. 2023c. What's in My Neighborhood. Minnesota Pollution Control Agency. https://www.pca.state.mn.us/data/whats-my-neighborhood

MPCA.2023d. Minnesota Groundwater Contamination Atlas. Minnesota Pollution Control Agency. https://www.pca.state.mn.us/data/minnesota-groundwater-contamination-atlas

U.S Census Bureau. 2024. North American Industry Classification System. https://www.census.gov/naics/.