

Cross-cutting area: Brownfield Program

considerations for PFAS

Remediation PFAS Guidance

Overview

The Voluntary Investigation and Cleanup (VIC) program provides technical assistance to promote the investigation, cleanup and redevelopment of brownfield properties contaminated with hazardous substances, pollutants, and contaminants. Unlike the Superfund Program, which requires a responsible party to address the full extent and magnitude of a release, including off-site impacts, the VIC program works with non-responsible parties who generally focus on potential exposure to on-site contamination as related to a specific development plan. Parties that [enroll in the VIC program](#) are responsible for addressing potential risk associated with their proposed actions relative to on-site contamination in order to receive technical assistance and/or liability assurances letters.

Sites are typically enrolled in the VIC program as part of the redevelopment or property transfer process. Past and/or current use(s) of the property should be examined to determine the potential for PFAS contamination. For a VIC site, the need for PFAS sampling and analysis is not triggered solely by the discovery that PFAS may be a contaminant of concern at a site. Additional considerations that trigger the need for PFAS sampling at a VIC site include whether site activities will create an exposure pathway relative to PFAS contamination or cause PFAS contamination to spread, whether the VIC applicant wants PFAS to be included in an identified release for a specific media, and the type of assurance letter requested.

If PFAS compounds are detected at a site and pose a risk to human health or the environment, based on the current or planned property use, then appropriate remedial and/or risk management strategies are necessary to mitigate that risk. Consistent with assurances issued for other hazardous substances, pollutants, and contaminants, an institutional control may be required for PFAS-contaminated media at the site to prevent disturbance or future exposure to PFAS contamination.

Site usage

How do I know if PFAS are potential contaminants of concern at a brownfield site?

A thorough Phase I Environmental Site Assessment (Phase I ESA) and a knowledge of the types of industries/practices associated with potential PFAS use are essential for determining whether PFAS are potential contaminants of concern at a brownfield site. The following general criteria provide a framework for evaluating whether a brownfield site may be impacted by a PFAS release. Refer to the [Initial Site Review](#) section for additional information.

- On-site or nearby industrial operations or practices that are likely to have used PFAS
- Proximity to a current or former dump or landfill
- Proximity to known PFAS contamination

Evaluation of property use should include consideration of industry categories and practices that are commonly linked to the use, storage, or disposal of PFAS. Given the widespread use of PFAS in the manufacturing sector, the list of possibilities is lengthy. A more comprehensive list of industry categories and practices that may use, store, or dispose of PFAS can be found in [Annex I](#).

Site investigation

When is testing for PFAS necessary at a brownfield site?

For a VIC site, the need for PFAS sampling and analysis is not triggered solely by the discovery that PFAS may be a contaminant of concern at a site. Additional considerations that trigger the need for PFAS sampling include whether site activities will create an exposure pathway relative to PFAS contamination or cause PFAS contamination to spread, whether the VIC applicant wants PFAS to be included in an identified release for a specific media, and the type of assurance letter requested.

It depends on the site activities. Every party enrolled in the VIC program must manage risk to human health and the environment that may stem from their proposed actions. If PFAS are potential contaminants of concern at a brownfield site and if the proposed actions may create a potential exposure pathway for PFAS or cause the contamination to spread, then testing for PFAS is required to identify and manage potential risk. Example scenarios include but are not limited to the following:

- An on-site water supply well may create a drinking water exposure pathway.
- An on-site irrigation well may mobilize PFAS-impacted groundwater and contaminate soil.
- A stormwater infiltration pond may leach PFAS-impacted soil and/or mobilize a PFAS plume.
- A greenspace area may create a soil exposure pathway. Site soil may be impacted due to, for example, on-site use of PFAS or PFAS-containing products, PFAS-impacted runoff from an adjoining property, or aerial deposition of PFAS from a nearby industry.
- Planned off-site reuse of soil may spread PFAS contamination to another property.

It depends on the desired scope of liability protection. The liability protection provided in a No Association Determination letter is limited to a specific identified release as documented by sampling results. If PFAS are potential contaminants of concern at a brownfield site, then testing for PFAS is recommended for voluntary parties who wish to obtain liability protection for PFAS, even if their proposed actions would not create a potential exposure pathway or cause the contamination to spread.

It depends on the type of assurance letter. A voluntary party enrolled in the VIC program can choose which assurance letter(s) to pursue. Different assurance letters have different technical requirements regarding the scope of the site investigation. For example, a Certificate of Completion requires a thorough investigation for all potential contaminants of concern in all applicable media, whereas a No Action Letter might be limited to a single media or a specific type of contaminant. For additional information on the types of assurance letters offered by the VIC Program, see the Minnesota Pollution Control Agency's (MPCA) [Brownfield Program Services](#) guidance document.

It depends on the landfill. In some circumstances, a landfill may request PFAS sampling of soil before accepting it for disposal. Voluntary parties should contact their chosen landfill prior to site redevelopment to confirm the landfill's data needs.

What about ambient background concentrations?

While PFAS are known to be widespread in the environment, information regarding ambient background concentrations of PFAS in Minnesota's soil, groundwater, and surface water is not widely available. The MPCA's [PFAS ambient background concentrations](#) white paper presents what is currently known about ambient background concentrations of PFAS in soil, based on studies conducted in a small number of other states. The MPCA has requested funding from the state legislature to conduct an ambient background soil study of PFAS in Minnesota.

The [PFAS ambient background concentrations](#) white paper indicates that ambient background concentrations of perfluorooctane sulfonate (PFOS) in soil are not expected to be present at concentrations above the current (2024) soil reference value (SRV) and thus would not pose a risk to people based on direct contact with soil. Therefore, development of a background threshold value (BTV) for PFOS is not needed at this time. However, ambient background concentrations of perfluorooctanoic acid (PFOA) in soil may be above the [current \(2024\) SRV](#) at some sites. Until such time that a Minnesota background threshold value for PFOA in soil can be developed, the MPCA Brownfield Program is adopting an interim BTV for PFOA, based on ambient background

data from other states, as described in the MPCA's white paper. **Note that this BTV for PFOA is only applicable to non-responsible party sites enrolled in the Brownfield Program.** For responsible party sites under the oversight of other Remediation Division programs, refer to the discussion of ambient background concentrations in the [Risk Assessment](#) section.

Identification of PFAS as a potential contaminant of concern at a brownfield site, for the purpose of this guidance, is based on the presence of an on-site or nearby potential source of PFAS. There is no expectation that PFAS testing be conducted at a brownfield site in the absence of a potential source. If a voluntary party chooses to sample for PFAS in the absence of a potential source, the detected PFAS compounds could be included, as appropriate, in an identified release for an assurance letter. Because PFAS are not naturally occurring compounds, any detections of PFAS, even if attributable to ambient background concentrations, would be evaluated to determine the need for remediation or risk mitigation.

Which specific PFAS compounds should be analyzed?

For any given analytical method, all analytes included in the method will be analyzed by the laboratory. The MPCA requires that all data generated by the analysis be reported. Please refer to the [PFAS Analytical Guidance](#) on the MPCA's website for information about analytical methods.

Risk evaluation

The risk assessment should evaluate existing conditions and proposed actions to identify potential on-site exposure or interaction with PFAS-impacted media, using the same risk assessment tools that are used for other types of contaminants.

- Use soil reference values (SRVs) to assess direct contact with soil. Refer to the [SRV spreadsheet](#) and [SRV technical support document](#) on the MPCA's website.
- While soil leaching values (SLVs) to assess the soil-to-groundwater leaching pathway have been developed for various other contaminants, SLVs are not being developed for PFAS. Given the low risk-based drinking water criteria established by the Minnesota Department of Health and the high mobility of PFAS in the environment, any detection of PFAS in soil is considered to pose a potential risk to groundwater. If a groundwater receptor is present at a brownfield site, the potential risk should be resolved by groundwater sampling for PFAS.
- The risk assessment should consider aspects of the development plan that could mobilize PFAS contamination, such as use of an on-site well for irrigation or increased point-source infiltration from a stormwater pond.

Remediation

If the risk assessment identifies a potential risk to human health or the environment at the site from PFAS-impacted media, based on the current or planned future use, then appropriate remedial and/or risk management strategies are necessary to mitigate that risk. See the [Remediation section](#) of this guidance for appropriate technologies for PFAS-impacted soil and groundwater. See the [Disposal section](#) of this guidance for information about managing PFAS-containing waste.

For a brownfield site, risk management may entail changing certain aspects of the development plan to avoid creating an exposure pathway or to avoid disturbing PFAS-impacted soil or groundwater. For example:

- Relocating the stormwater infiltration pond or choosing a different type of stormwater management system to avoid leaching of PFAS-impacted soil and/or mobilization of PFAS-impacted groundwater due to enhanced stormwater infiltration.
- Choosing a building design that minimizes excavation of PFAS-impacted soil during construction to reduce soil disposal challenges.
- Sealing an on-site water supply or irrigation well to avoid potential exposure to and mobilization of PFAS-impacted groundwater.

Site closure

Closure of a brownfield site occurs when the conditions/requirements of any VIC assurance letters issued for the site have been met and any required institutional control has been filed with the county. If a voluntary party withdraws from the Brownfield Program prior to on-site risk being resolved, or if potential off-site risk is present, the unresolved risk will be referred to the MPCA's Site Assessment Program for further evaluation.