# PFAS Sampling

##### **Introduction and Scope**

##### Use this supplemental Standard Operating Procedure (SOP) during field investigations to collect samples for polyfluoroalkyl and perfluoroalkyl substances (PFAS) that are representative of current site conditions. It is possible to cross-contaminate samples from other sources and these procedures help to prevent sample alteration or cross-contamination through the use of specific sampling and handling techniques.

##### This SOP is being drafted to provide information on sampling equipment and techniques for various media and is based on current knowledge of PFAS. This SOP is subject to change as more information regarding PFAS becomes available. This draft SOP supplements, but does not replace, the current official FDEP SOPs.

##### **General Equipment and Supplies**

##### Avoid personal protective equipment (PPE) and field supplies that may include PFAS which could cross-contaminate field samples.

##### Personal body products such as shampoos, moisturizers and cosmetics may contain PFAS and should be used with care the day of sampling unless on a portion of the body that will be covered by PFAS-free clothing.

##### Sunblock and insect repellent ingredients need to be verified to ensure that they do not contain PFAS before use in the field. Clothing chemically treated for ultraviolet protection should be avoided.

##### Food and food packaging within the sampling zone should be avoided during sampling for PFAS.

##### Several brands of waterproof field books contain PFAS and should not be used. Documentation of field activities should be on loose paper on an aluminum clipboard or in a waterproof field book that does not use PFAS. Field notes should be taken with a ball point pen and not any type of felt tip marker.

##### Some adhering materials contain PFAS, including sticky notes, and should be avoided. Pre-printed labels should be verified as PFAS-free.

##### Chemical ice packs should not be used unless it is verified that they are PFAS-free. Samples for PFAS analysis should be placed on water ice immediately and should ideally be received by the laboratory at a temperature less than 6º Celsius.

##### Disposable, powderless, nitrile gloves must be worn during PFAS sampling and handling activities and should be changed frequently during and between sampling activities.

##### Water resistant, waterproof, stain-treated, clothing recently washed with fabric softeners, and new clothing should be avoided. If sampling in inclement weather a canopy tent may be a good option. However, any water resistant or waterproof material likely contains PFAS and disposable nitrile gloves should be worn when putting up and/or moving the tent.

##### **General Sampling Procedures**

##### Sample containers should be made of laboratory provided polypropylene or HDPE. If liners are present in the sample caps it should be verified that they are not made of Teflon® and do not contain PFAS. Glass bottles should be avoided as they may result in low-biased sample results.

##### If non-dedicated non-disposable equipment is used for sampling, proper decontamination is necessary. Decontamination reagents should be checked to ensure that they do not contain PFAS before use. Similarly, water used for decontamination should be checked (i.e. field equipment blanks) to verify that it does not contain PFAS.

##### Some decontamination reagents may not be suitable for the removal of PFAS during decontamination (i.e. they may not be appropriate for unbinding PFAS from the surface of field equipment prior to rinsing). Equipment blanks are recommended to ensure that the reagents used for decontamination successfully remove PFAS from field equipment.

##### **Soil Sampling Procedures**

##### Soil samples should be collected using stainless steel, acetate, or polypropylene constructed equipment. Liners for soil sampling should not contain PFAS. Acetate or single-use PVC liners may be acceptable.

##### Care should be taken to not cross contaminate PFAS samples if other analyses are being sampled for. A separate set of sampling equipment and laboratory sample containers is recommended for PFAS sampling, with decontamination, as necessary, and glove changes in between sampling for non-PFAS contaminants of concern and PFAS.

##### **Groundwater Sampling Procedures**

##### If a monitoring well has dedicated tubing that may contain PFAS, the dedicated tubing should be removed, and silicone or HDPE tubing should be used to sample for PFAS following at least one well volume purge prior to sampling for PFAS.

##### The recommended length of time that dedicated tubing should be removed, and the recommended amount of purging conducted prior to sampling where dedicated tubing has been present is variable. If it is anticipated that dedicated tubing may be a source of PFAS cross contamination extra precaution, such as removal of the tubing 14 days prior to sampling or purging of three well volumes, should be considered.

##### Care should be taken to not cross contaminate PFAS samples if samples for non-PFAS analyses are being collected. For example, if volatile organic compounds (VOCs) and PFAS samples are being collected, the VOCs would be collected using a peristaltic pump with HDPE and silicone tubing, and then a second set of samples would be collected for PFAS after changing gloves and switching sample container sets.

##### **Surface Water Sampling Procedures**

##### If transfer bottles are necessary for surface water sample collection, they should be PFAS-free and made of the same material as the laboratory provided sample containers.

##### If waders are necessary, the wader material should be checked to ensure that it does not contain PFAS (i.e. hasn’t been coated with waterproof material).

##### **Water Supply Sampling Procedures**

##### If a treatment unit is in use, both a pre- and post-treatment sample may be necessary. Carbon filtration, reverse osmosis, and other filter media may bias laboratory results for PFAS.

##### Water should be allowed to run freely until water quality parameter stabilization has occurred, typically between 3 and 5 minutes.

##### Water flow rate should be reduced for minimal aeration.

##### Do not filter samples for PFAS analysis.

##### **Quality Assurance / Quality Control (QA/QC)**

##### Equipment blanks are recommended to ensure that proper decontamination of sampling equipment is performed. It may also be necessary to collect samples of water being used for decontamination prior to use to ensure that water being used for decontamination does not contain PFAS.

##### Blank water should be certified as PFAS free.

##### Field blanks are recommended to evaluate the potential for introduction of site-specific contaminants into samples by ambient air.

##### Trip blanks are recommended to evaluate the potential for introduction of contaminants during transport of the sample containers from the laboratory to the site, or from the site to the laboratory.

##### Field duplicates are recommended to verify laboratory accuracy.

##### Matrix Spike and Matrix Spike Duplicate Samples are recommended to assess interferences caused by the sample matrix.

##### **Laboratory Analytical Methods**

##### The lab analytical methods for PFAS include the following:

* Drinking water (not ground or surface water): Method 537 (LC/MS/MS)
* Surface, ground, waste water: Method 8321 (LC/MS/MS)
* Surface, ground, and waste water: Method 8327 (method is still in draft form)
* Surface and sludge water: ASTM D7979-17
* Soil: ASTM D7968-17a
* Soil and other solids: Method 8321 (LC/MS/MS)

Some labs report PFAS in ground and surface water by Method 537 mod., and EPA researchers are currently working on validating methods to measure PFAS in groundwater, surface water, wastewater, and solids. It is important to note that the laboratory methodologies for analysis of PFAS are evolving. For example, some federal agencies consider Method 8327 useful for screening levels only. Laboratories should be contacted prior to sample submittal to verify that they are certified, as appropriate, to conduct PFAS analyses for the respective media being sampled and analyzed using the most updated sample methodologies. Laboratory reports should be validated for QA/QC to ensure that the method selected for analysis is suitable.

##### **References**

##### Interstate Technology Regulatory Council (ITRC), 2018. Site Characterization Considerations, Sampling Precautions, and Laboratory Analytical Methods for Per- and Polyfluoroalkyl Substances (PFAS), Fact Sheet. <https://pfas-1.itrcweb.org/wp-content/uploads/2018/03/pfas_fact_sheet_site_characterization_3_15_18.pdf>

##### United States Environmental Protection Agency (USEPA), 2016. PFOA and PFOS Drinking Water Health Advisories, Fact Sheet. <https://www.epa.gov/sites/production/files/2016-06/documents/drinkingwaterhealthadvisories_pfoa_pfos_updated_5.31.16.pdf>

##### United States Environmental Protection Agency (USEPA), 2019. Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS), Methods and Guidance for Sampling and Analyzing Water and Other Media, Technical Brief. <https://www.epa.gov/sites/production/files/2019-02/documents/pfas_methods_tech_brief_28feb19_update.pdf>