

PFAS Sampling Information For Water Systems Performing Sample Collection

1. Choosing a Laboratory

The analytical laboratory selected for regulated compounds perfluorononanoic acid (PFNA), perfluorooctanoic acid (PFOA), and perfluorooctanesulfonic acid (PFOS) analysis must be certified by the New Jersey Department of Environmental Protection (NJDEP) Office of Quality Assurance (OQA). PFNA, PFOA and PFOS are part of a larger class of substances referred to as per- and polyfluoroalkyl substances (PFAS). The methods allowed for the analysis PFAS in drinking water are EPA 537, EPA 537.1, and EPA Method 533. The list of laboratories certified for EPA 537, 537.1, or 533 in a drinking water matrix can be found by going to the NJDEP webpage at www.nj.gov/dep. Go to **Data Miner** found under **Information Tools** and choose the Category **Certified Laboratories**.¹

Ensure that the laboratory:

- has a detection limit (DL) less than or equal to 2 ng/L and a minimum reporting level (MRL) less than or equal to 5 ng/L for PFNA, PFOA and PFOS,
- can electronically submit the results to the NJDEP through E2,
- will provide a laboratory report that includes at a minimum:
 - qualified results (J-flagged) if PFNA, PFOA, or PFOS is detected between the DL and the MRL;
 - a sample results report listing both the DL and MRL;
 - Field Reagent Blank (FRB) results if analyzed; and
 - documentation of any analytical issues that did not meet the method specifications.
- if requested, can provide quality control (QC) information that includes calibration check recoveries, surrogate recoveries, laboratory fortified blank (LFB) recoveries, internal standard responses and matrix spike information (Level 2 data package).
- can meet the required timeframe of submitting the data using E2 to the NJDEP within 10 days of the following quarter,
- for every quarter, can accommodate the analysis of your treatment plant samples and any possible FRB analyses.

2. Planning for the sampling

Minimize potential of background contamination:

Due to the ubiquitous nature of these PFAS, there is a higher than usual potential for sample contamination. To minimize this potential, careful preparation for this sampling event is strongly recommended. The clothing worn, personal care products used, and objects brought to the sampling site should be considered.

¹ Or follow this link:

<https://www13.state.nj.us/DataMiner/Search/SearchByCategory?isExternal=y&getCategory=y&catName=Certified+Laboratories>

Clothing NOT to be worn includes:

- Tyvek suits
- Flame resistant clothing (including shoes, hats, bags, gloves, headsets or accessories)
- Water resistant, stain resistant or water repellent clothing including shoes, hats, bags, gloves headsets or accessories.
- Rain gear made from fluoropolymers such as Gore-Tex or fabric with water resistant coating (breathable waterproof)²
- Clothing (including lab coats) that had been washed with fabric softener.

NOTE: On the day of sampling it is recommended to wear clothing that has been washed several times **without** fabric softener.

Avoid use of the following personal care products prior to or during sampling:

- Moisturizers and creams
- Fluoride containing toothpaste or mouthwash
- Cosmetic products (including nail polish)
- Dental Floss
- Shaving cream
- Shampoo and conditioner
- Sunscreen
- Insect repellent
- Sanitizer

NOTE: the use of such products should be avoided or minimized on the day of sampling, and 24 hours prior to sampling

Do not bring the following to the sampling site:

- Fast food (due to packaging), packaged food, pizza boxes and any food such as baked goods or sandwiches wrapped in grease-proof paper or bags.
- Aluminum Foil
- Adhesives (including Post It notes and scotch tape)
- Plumber sealant tape (thread tape) and plumbing paste
- Materials containing fluoropolymers such as PTFE (Teflon), ETFE (Tefzel), PFA, FEP
- Waterproof paper or notebooks
- Permanent Markers (use ball point pens)
- Plastic clipboards
- Glass bottles

Field Reagent Blanks (FRBs)

A field reagent blank (FRB) is defined as an aliquot of reagent water that is placed in a sample container in the laboratory and treated as a sample in all respects, including shipment to the sampling site, exposure to sampling site conditions, storage, preservation, and all analytical procedures. The purpose of the FRB is to determine if method analytes or other interferences are present in the field environment.

² PVC, polyurethane, polyethylene or rubber rain gear can be worn.

It differs from a trip blank in that it is “treated as a sample in all respects, including shipment to the sampling site, exposure to sampling site conditions, storage, preservation and all analytical procedures.” The sample collector will expose the preserved laboratory reagent water provided by the analytical laboratory to the sampling environment by pouring one of the bottles of preserved laboratory reagent water into an empty sample bottle. It is then capped and labeled as the FRB collected at that specific point of entry to the distribution system (POE) location.

Procedure for preparation of field reagent blanks

The EPA analytical method(s) used for the analysis of PFAS **requires** preparation of a FRB at each sampling point or, in this case, every POE. If a public water system is required to sample multiple POEs for PFAS a FRB must be prepared at each of these POEs immediately before collecting the POE sample. Individual bottles of preserved laboratory reagent water for each POE being sampled will be provided by the analyzing laboratory. The sample collector will pour the water from one of the bottles of preserved laboratory reagent water into the empty FRB bottle designated for that specific POE. The FRB label should identify that FRB with that POE.

The associated FRB prepared at the POE must be analyzed if PFNA, PFOA, and/or PFOS is found in that POE sample at or above the laboratory’s minimum reporting level (MRL). If PFNA, PFOA, and/or PFOS is detected above 2 ng/L in the FRB, the laboratory will contact the NJDEP Bureau of Safe Drinking Water (BSDW). The BSDW will evaluate the validity of the detected result in the POE sample and may require that a replacement POE sample be collected and analyzed.

NOTE: Due to the expense and time involved with PFAS monitoring, extreme care must be taken to avoid contamination by planning in advance of the sampling event.

3. Preparing for the Sampling Event:

Determine approximate date for sampling:

A water system will either perform the PFAS sample collection themselves or use another entity such as a consultant or laboratory. For those instances where the FRBs and POE samples will require shipping to the analyzing laboratory, it is important that the analyzing laboratory be notified at least 2 weeks prior of the expected sampling date. This is done to provide the analyzing laboratory with the time necessary for the preparation of the contaminant free laboratory reagent blank water with preservative for the FRBs, the field sample bottles, the empty bottles for the FRBs and any other quality control samples the analyzing laboratory will require. In most cases each of the water system’s active POEs will require monitoring but should be verified by reviewing the water system’s active sampling schedule in NJDEP’s [Drinking Water Watch](http://www.nj.gov/dep/watersupply/) (www.nj.gov/dep/watersupply/). The POE locations and codes should be provided to the analyzing laboratory to ensure that the correct number of bottles and supplies can be shipped to the water system or other entity performing the sampling. Once the supplies are received, every effort should be made to collect the PFAS samples within 4 days. The laboratory reagent water and bottles must be stored where they will not be exposed to contamination and maintained at a temperature between 6°C and 15°C.

Planning for shipping of the collected samples

The following should be considered if the samples will need to be shipped to the analytical laboratory:

- The hold time for the samples (which includes both the POE samples and the FRBs) is 14 days from collection for EPA 537 & EPA 537.1 and 28 days for EPA 533.
- The samples that are significantly above 10°C at the time of collection will need to be iced with PFAS-free water³ or refrigerated for a period of time in order to chill them prior to shipping or delivery to the laboratory.
- Samples (which includes both the POE samples and the FRBs) must be extracted by the laboratory within 14 days from collection for EPA 537 & EPA 537.1 and 28 days for EPA 533. Extracts must be analyzed within 28 days after extraction for all three methods.
- The samples must be maintained at a temperature no higher than 10°C during shipment within the first 48 hours from sample collection.
- The samples will need to be received at the laboratory at a temperature no higher than 10°C within the first 48 hours after sample collection. After 48 hours the samples must be received at 6°C or lower but must not be received frozen.
- When planning a date for sample collection, determine in advance if the analytical laboratory has preferential days of the week for receipt of the shipped samples.
- The analytical laboratory must be able to accept and store the samples appropriately if received at the laboratory on a weekend or evening.
- If sampling was conducted during the end of the week and received by the laboratory over a weekend, the laboratory may not start the analysis of the samples until the following work week. This will impact the sample hold time.

The supplies received from the analyzing laboratory should include the following:

For “X” number of POEs being sampled, the laboratory should send **at a minimum**:

- “X” number of polypropylene bottles with polypropylene screw caps and containing a solid preservative (Trizma for EPA 537 & 537.1, ammonium acetate for EPA 533) which serves as a dechlorinating agent and buffer. These are to be used for the POE samples.

NOTE: Depending on the laboratory’s standard operating procedures for EPA 537, 537.1 or 533 analysis, more than one sample⁴ may be needed to be collected as part of their ongoing Quality Control requirements.

- “X” number of empty polypropylene bottles with polypropylene screw caps to be used for the FRBs.
- “X” number of polypropylene bottles with laboratory provided reagent water which is purified water that had been tested as not having any measurable quantities of method analytes or interfering compounds and also contains a preservative. The water in these bottles will be used to prepare the FRBs.
- Each of the three groups of polyethylene bottles described above should be contained in clean polyethylene sealable bags to prevent contamination during shipping.

³ Unless the water used for the ice was tested to be PFAS-free it may be difficult to obtain PFAS-free ice. Therefore, to avoid water from the ice seeping into the samples, both the collected POE samples and the prepared FRBs should be stored separately in new clean polyethylene sealable bags.

⁴ Many laboratories will require filling three sample bottles at each POE sampling location.

- Chain of Custody Form
- Shipping Instructions, if applicable
- Cooler for shipping samples back to the laboratory

Storage of Sampling Supplies

When received, immediately store the bottles with the preserved laboratory provided reagent water at a temperature between 6°C and 15°C and away from any source of contamination. The period of time for storage of these bottles should not exceed four days.

4. The Sampling Event

Prior to day of sampling event:

The laboratory will send a chain of custody form with the sample bottles. Review the laboratory's instructions for completing the chain of custody. The amount of pre-entered information on the COC depends upon the laboratory.

For water systems with multiple POEs, the sequence in which the POEs will be sampled should be established in advance. This sequence can then be recorded on the chain of custody prior to the sampling event. Some laboratories will have affixed the labels to the samples bottles prior to shipping in order to avoid the handling of adhesive labels at the sampling site.

Use a cooler that had recently been cleaned with PFAS-free soap such as Alconox and PFAS-free water.

Have fresh bags of PFAS-free ice⁵ ready for use on the day of sample collection.

Remove any supplies or equipment that contain Teflon or polytetrafluoroethylene (PTFE) or anything with "fluoro" in its name.

If bringing paper towels to the site, ensure that they are **UNTREATED** paper towels and not PFAS treated paper towels.

Supplies Needed: *(refer to the above to ensure that nothing used at the sampling site will contribute to background contamination.)*

- Chain of Custody
- Cooler (may have been provided by analyzing laboratory)
- Bags of PFAS-free ice⁴ Do not use blue ice or chemical ice.
- Ball point pen (DO NOT use markers or Sharpies)
- Bottles with preserved laboratory reagent water for each POE
- Bottles with preservative for each POE being sampled
- Empty bottles for the FRB from each POE
- Polyethylene sealable bags for FRBs
- Polyethylene sealable bags for POE samples

⁵ Unless the water used for the ice was tested to be PFAS-free it may be difficult to obtain PFAS-free ice. Therefore, to avoid water from the ice seeping into the samples, both the collected POE samples and the prepared FRBs should be stored separately in new clean polyethylene sealable bags.

- Pairs of powderless nitrile gloves for each POE being sampled
- Sample bottle labels (if not already affixed to the bottles)

Information Relevant to the Day of Sampling Event:

- To save time chilling the samples after collection, the water system may elect to keep bags of ice in the cooler while conducting the sampling. Do not use blue ice or chemical ice when chilling the sample bottles. Keep all collected samples and FRBs in sealable PE bags.
- When transporting samples, do not place samples/bottles directly on vehicle upholstery, office upholstery or floor rugs since it most likely had been stain, fire and/or water resistant treated.
- Avoid sample collection in the rain.
- Keep caps on all sample bottles until time to collect sample or prepare FRBs. Do not mix up caps and bottles.
- Wash hands with water and PFAS-free soap. Use water that had not been stored in any type of Teflon container.
- DO NOT confuse the bottles to be used for the FRB samples with the bottles to be used for the POE samples.
- Use a fresh/new pair of nitrile gloves at each sampling site.
- If collecting samples for other parameters that day, collect all PFAS POEs samples and associated FRBs first.
- The FRBs should be stored separately from the POE samples in different polyethylene sealable bags.
- Aerators and screens must be removed before collection of samples.

Sampling Procedure:

- 1) Before putting on nitrile gloves, remove aerators or screens on sampling tap if present.
- 2) Before putting on nitrile gloves, let water run for about 3 to 5 minutes and until water temperature has stabilized.
- 3) Put on a clean pair of powderless nitrile gloves.
- 4) Prepare the FRB for that POE by pouring water from one of the bottles of preserved laboratory reagent water into an empty field reagent bottle. **DO NOT USE** any remaining laboratory reagent water from that bottle for any other FRBs to be prepared. Discard excess field reagent water at an appropriate location. Label the FRB so that it is associated with that POE sample location. The POE Facility ID code can be referenced. *Example: FRB for TP001001*
- 5) Place the FRB in a sealable polyethylene bag specified for FRBs.
- 6) On the chain of custody, record the date and time that the FRB was prepared for the POE being sampled at that location.
- 7) Collect the POE sample by filling one of the bottles containing the preservative. Do not fill to overflowing since that will cause loss of the preservative. A headspace free sample is not required with this sampling. Be aware of where the bottle cap is placed while filling the sample bottle.
- 8) Record the POE location and Facility ID on the sample bottle label.
- 9) Cap the bottle and invert 3 times to dissolve the preservative. DO NOT OPEN.
- 10) Place the sample in a sealable polyethylene bag specified for POE samples.
- 11) Record the date and time of the POE sample collection on the chain of custody. If the bottle label has a laboratory generated identifier code or number, include that identifier on the chain of custody

along with the location of the POE and the Facility ID for that POE.
12) Place bottles in pre-cleaned cooler that has bags of PFAS-free ice. Do not use blue ice.

Completion of Chain of custody:

Name of sampler: **Printed**, signed and dated and include sampler's **affiliation** (water system, consulting firm, laboratory).

Storage of samples after collection and before shipping:

Store samples in pre-cleaned cooler or other non-Teflon container.

The analytical method requires that the samples must not exceed 10°C during the first 48 hours after collection.

If not shipping the samples immediately, chill samples with a sufficient amount of ice or refrigerate samples at a temperature of 10°C or lower (do not freeze) and away from any source of contamination.

To ensure that the samples are received by the laboratory at or below 10°C, it may be necessary to refrigerate or chill the samples for a period of time before shipping.

Pack cooler with fresh PFAS-free bagged ice. Do not use chemical ice packs or blue ice.

Shipping

It is important to coordinate in advance with the laboratory to determine if certain days of the week and/or holidays are not recommended by the laboratory for sample shipping. Ship samples on bagged ice to ensure sample temperature does not exceed 10°C if received by the laboratory within 48 hours from time of collection. If samples will be received by laboratory beyond 48 hours from sample collection, then chill samples to 6°C.

Storage of Samples at the Laboratory

Samples stored in the laboratory must be held at or below 6°C until extraction. Samples must be extracted by the laboratory within 14 days of collection for EPA 537 & EPA 537.1 and 28 days for EPA 533. Extracts must be analyzed within 28 days after extraction.

For more information

Water systems and samplers should review [EPA Method 537](#), [EPA 537.1](#), and/or [EPA Method 533](#) prior to sample collection, especially Section 8 – Sample Collection, Preservation and Storage, and Section 9 – Field Reagent Blank analysis requirements.