STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JANET T. MILLS
GOVERNOR

MELANIE LOYZIM
COMMISSIONER

Date

Address

Re: Leachate Sampling and Testing Requirements for PFAS

Dear:

In July 2021, LD 1600, An Act to Investigate Perfluoroalkyl and Polyfluoroalkyl Substance Contamination of Land and Groundwater, became law with an effective date of October 18, 2021. The law puts forth a requirement to test landfill leachate for per- and polyfluoroalkyl substances (PFAS). The Department is now requiring licensed solid waste landfill facilities that collect and manage leachate to conduct periodic testing of leachate for PFAS.

After October 18, 2021, each facility will be required to test leachate each fall and spring through 2023 for a total of five sampling rounds. Samples must be collected at a location that is representative of leachate from the landfill (i.e., not from an open leachate pond). At a minimum, the leachate will need to be analyzed for the PFAS listed in Table 1. PFAS sampling requires specific procedures to prevent inadvertent cross contamination of samples. To ensure sample integrity and data usability, I recommend you follow the Department's DRAFT PFAS sampling guidance included as Attachment 1. This updated guidance will be published on our website following final Department approval. The Department will consider other sampling procedures and protocols not contained in Attachment 1 or outlined in this letter; however, Department approval is required before an alternative plan can be implemented.

You must use a laboratory approved by the Department to test for these compounds. A list of laboratories that the Department has already prequalified based on specific matrices is appended as Attachment 2. You should use a laboratory that is approved to analyze for PFAS in the wastewater matrix. If you wish to use a laboratory not included in Attachment 2, you will need to submit the laboratory's extraction and analysis standard operating procedures for the Department's review and approval prior to having the samples analyzed. All data must be submitted to the Department in Electronic Data Deliverable (EDD) format, Version 6.0, along with a .pdf copy of the complete laboratory report including quality control and quality assurance information within 15 days of receipt. The laboratory report should be submitted to the Department project manager. If you do not know who your project manager is, please contact me for assistance. The EDD should be sent via email to dep.edd@maine.gov. Following a data quality review, the data will be uploaded to the Department's Environmental and Geographic Analysis Database (EGAD).

Results of the monitoring will be incorporated into a report to the Maine Legislature in January 2024. Based on an evaluation of the data, the Department is tasked with making recommendations, proposing additional legislation if needed, and may require additional leachate testing from this point forward.

I appreciate your cooperation in this matter, and I understand you may have questions as you move forward. If you have questions, please do not hesitate to contact me.

Sincerely,

Molly King, L.G.
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Bureau of Remediation and Waste Management
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Table 1

CAS Number	Parameter Name	Abbreviated Name
375-22-4	Perfluorobutanoic Acid	PFBA
2706-90-3	Perfluoropentanoic Acid	PFPeA
375-73-5	Perfluorobutanesulfonic Acid	PFBS
757124-72-4	1H,1H,2H,2H-Perfluorohexanesulfonic Acid	4:2FTS
307-24-2	Perfluorohexanoic Acid	PFHxA
2706-91-4	Perfluoropentanesulfonic Acid	PFPeS
375-85-9	Perfluoroheptanoic Acid	PFHpA
355-46-4	Perfluorohexanesulfonic Acid	PFHxS
335-67-1	Perfluorooctanoic Acid	PFOA
27619-97-2	1H,1H,2H,2H-Perfluorooctanesulfonic Acid	6:2FTS
375-92-8	Perfluoroheptanesulfonic Acid	PFHpS
375-95-1	Perfluorononanoic Acid	PFNA
1763-23-1	Perfluorooctanesulfonic Acid	PFOS
335-76-2	Perfluorodecanoic Acid	PFDA
39108-34-4	1H,1H,2H,2H-Perfluorodecanesulfonic Acid	8:2FTS
68259-12-1	Perfluorononanesulfonic Acid	PFNS
2355-31-9	N-Methyl Perfluorooctanesulfonamidoacetic Acid	NMeFOSAA
2058-94-8	Perfluoroundecanoic Acid	PFUnA
335-77-3	Perfluorodecanesulfonic Acid	PFDS
754-91-6	Perfluorooctanesulfonamide	FOSA
2991-50-6	N-Ethyl Perfluorooctanesulfonamidoacetic Acid	NEtFOSAA
307-55-1	Perfluorododecanoic Acid	PFDoA
72629-94-8	Perfluorotridecanoic Acid	PFTrDA
376-06-7	Perfluorotetradecanoic Acid	PFTA
13252-13-6	2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]- Propanoic Acid	HFPO-DA
9119005-14-4	4,8-Dioxa-3h-Perfluorononanoic Acid	ADONA
67905-19-5	Perfluorohexadecanoic Acid	PFHxDA
16517-11-6	Perfluorooctadecanoic Acid	PFODA
PFAS, Total (6)	Sum of PFOA, PFOS, PFNA, PFHpA, PFHxS, and PFDA	

1.0 INTRODUCTION

The introduction will state the objectives of the sampling plan which include:

- Goals of the sampling plan;
- End use of data.

2.0 BACKGROUND INFORMATION

A BRIEF explanation of the background of the Site and/or conceptual site model (CSM) and reason for sampling for PFAS will be presented.

3.0 SITE SPECIFIC HEALTH AND SAFETY PLAN

If determined necessary, a Site-Specific Health and Safety plan (HASP) will be developed and attached.

4.0 SAMPLING METHODOLOGY/ EQUIPMENT

A description of the sampling methodology will be included in the SAP. In instances where a MEDEP/DR SOP is available, reference to SOPs by either name or document number is sufficient.

Currently, the MEDEP/DR QAP has SOPs for the following sample collection tasks which may be pertinent to PFAS sampling:

- 001-Water-Sample-Colllection-From-Water-Supply-Wells;
- 002-Groundwater-for-Site-Investigation;
- 003-Low-Flow-Groundwater-Sampling;
- 004-surface-water-sediment;
- 006-soil-sampling;
- 010-Container-Sampling;
- 015-Incremental-sample-methodology;
- 023-Pore-Water-Sampling.

Other SOPs may be utilized on a project specific basis if MEDEP/DR does not have a current SOP for sampling a particular media or situation. Prior Department approval is necessary.

Prior to the start of a sampling event and after breaks, the sample handler must wash their hands and don nitrile gloves. Washing may be warranted between sample locations if sampling soil prior to water or when moving between high and low concentration sample points, potentially creating a risk of cross contamination. A new set of gloves must be used between sample locations and after activities such as deconning equipment. The common use of PFAS in materials such auto upholstery, textiles and food packaging increase the chance of cross-contamination during the course of a sampling event. Proper hand washing and wearing nitrile gloves will help to minimize this type of accidental contamination of the samples, particularly when driving between locations, moving pumps, generators or other equipment between sample points.

Some sampling equipment, field supplies, field clothing and personal protective equipment are prohibited when sampling for PFAS. Table 1 outlines the prohibited and acceptable items. This table must be included in the SOP and field staff informed as to what equipment is allowed. Data are scarce for individual products, so in all field events handwashing, field and equipment blanks and nitrile gloves are the best way to limit and assess any cross-contamination.

Table 1: Summary of Prohibited and Acceptable Items for Use in PFAS Sampling

Field Equipment	
Prohibited Items	**Acceptable Items**
Teflon® containing materials. Aluminum foil – run equipment blank if needed. Water resistant sample bottle labels.	High-density polyethylene (HDPE) and stainless-steel materials. Paper sample labels covered with clear packing tape, or lab-supplied labels.
Teflon® tubing, LDPE tubing	Silicon or HDPE tubing
Chemical (blue) ice packs	Regular ice in resealable freezer bags, or PFAS-free ice packs
Excel Purity Paste TFW Multipurpose Thread Sealant Vibra-Tite Thread Sealant	Gasoils NT Non-PTFE Thread Sealant Bentonite or other PFAS-Free sealant for fittings
Equipment with Viton Components need to be evaluated on a case by case basis. Viton contains PTFE, but may be acceptable if used in gaskets or O - rings that are sealed away and will not come into contact with sample or sampling equipment.	Viton components are acceptable when tested by field/equipment blanks
Field Clothing and PPE	
Prohibited Items	**Acceptable Items**
New clothing or water resistant, waterproof, or stain treated clothing, clothing laundered with fabric softeners, clothing containing Gore-Tex™	Well-laundered clothing, defined as clothing that has been washed 6 or more times after purchase, made of synthetic or natural fibers (preferable cotton). Cotton coveralls are one option that reduces the need for specialized personal clothing and provide a barrier to cross-contamination from clothing otherwise prohibited.
Boots or waders containing Gore-Tex™, or other waterproof treatment, if sampling requires contact with sample media, (wading for example) This does not apply to soil sampling.	Boots made with polyurethane and PVC for wet conditions, or rubber overboots (“chicken boots”) when site conditions present a risk for cross-contamination, standard safety footwear.[1]
Gore-Tex™ or similar breathable coated waterproof or resistant rain gear, unless worn under cotton or natural fiber coveralls.	Polyurethane, vinyl, wax or rubber-coated rain gear.

No personal care products (PCPs) should be handled while at a sampling location. When field conditions dictate use of sunscreens or other PCPs proper handwashing and fresh nitrile gloves prior to sampling are required and will prevent any direct contact with sample media.
Insect Repellents - Sawyer permethrin clothing treatment, Deep Woods Off, Insect Shield pre-treated clothing have been tested as PFAS-free, other options acceptable with appropriate hand washing and use of nitrile gloves. As with PCPs no repellents should be handled while at a sampling location.[2]

Sample Containers	
Prohibited Items	**Acceptable Items**
LDPE, glass containers or passive diffusion bags.	HDPE sample containers (any media) or polypropylene (only for EPA Method 537.1 samples) Lined or unlined HDPE or polypropylene caps
Storage of samples in containers made of glass or LDPE materials	
Teflon®-lined caps	
Equipment Decontamination	
Decon 90	Alconox® and/or Liquinox®
Water from on-site well or unknown source	Potable water from municipal drinking water supply (if tested as PFAS-free); Lab-supplied PFAS-free water
Food Considerations	
Food and drink, with exceptions noted on the right, should only be consumed in staging areas	Bottled water, personal water bottles, and hydration drinks (i.e. Gatorade® and Powerade®) to be brought and consumed only between sample locations.

(1) Based on the lack of contact between footwear and sample media there is limited risk of cross-contamination by this pathway.
(2) Bartlett SA, Davis KL. Evaluating PFAS cross contamination issues. *Remediation*. 2018;28:53–57.

It is recommended that all water samples will be collected using dedicated or disposable sampling equipment where possible. Any re-usable equipment, such as plumbing fittings, that may be needed in certain cases to obtain a sample from the pressure tank tap, should be deconned using Alconox/Liquinox soap and rinsed with PFAS-free water prior to use and between locations.

If materials such as aluminum foil are needed and will be in contact with sampling equipment a rinsate/equipment blank is recommended. Due to variability among manufacturers and batches by the same manufacturer a blank should be completed each field event. Potential PFAS cross-contamination should not compromise site safety or staff health and safety requirements while conducting sampling events.

5.0 SAMPLE LOCATIONS

A map showing planned sampling locations will be included in the sampling plan. If locations are not pre - determined, the method that samples will be chosen and collected (field observations, random, etc.) will be outlined in the SAP. Field or laboratory compositing procedures will also be described, if applicable.

This section should also indicate sampling collection priority and order, to assure that the most important samples are obtained, and that sampling is generally done from low areas of contamination to higher levels of contamination. It is recommended that critical samples be collected in duplicate.

6.0 MEDIA SAMPLED

A chart outlining the media collected and sample analysis will be included in the SAP. Table 2 provides several current methods with their associated media:

TABLE 2
Media/Analytical Methodology

MEDIA	LABORATORY METHOD	HOLD TIME*/ PRESERVATION	ANALYSIS TIME	Reporting List
Public Drinking Water Supply **	USEPA Method 537.1 or USEPA Method 533	14 days to extraction/Trizma***	28 days after extraction	Method specific
Groundwater and Private Water Supplies	Modified Method 537 (Isotope Dilution)	14 days to extraction/<6°C	28 days after extraction	DEP Minibid list ****
Surface Water	Modified Method 537 (Isotope Dilution)	14 days to extraction/<6°C	28 days after extraction	DEP Minibid list ****
Soil/Sediment/sludge	Modified Method 537 (Isotope Dilution)	14 days to extraction/<6°C	28 days after extraction	DEP Minibid list ****
Other (vegetation…)	Modified Method 537 (Isotope Dilution)	Lab specific	Lab specific	DEP Minibid list ****
Water or Soil	TOP or other total fluorinated analysis	Lab specific/<6°C	Lab specific	Method specific

* Hold time of 14 days is specified by DEP
** USEPA Method 537.1 and Method 533 are currently the only Maine certified methods for drinking water, however MEDEP routinely uses the modified Method 537 with isotope dilution from approved laboratories for groundwater and residential water supplies
*** Trizma needed for samples that may contain residual chlorine from treated water sources
**** Longer reporting lists may vary between laboratories, generally the DEP mini-bid list can be used for all projects

Other methods may be appropriate based on the data quality objectives of the sampling project.

The contracted analytical laboratory must be Maine certified to perform any method for which Maine provides certification. The contract lab must be able to accommodate the sample load and perform the analyses within holding times. The contract lab must be able to achieve PQLs, for all analyses, which are below the associated regulatory guideline value.

Containers, preservation, and holding times will be as recommended by the laboratory providing analytical services. Special or out of the ordinary containers or preservation should be noted in the SAP.

7.0 FIELD QC SAMPLES

The specific needs for QC samples for the project will be outlined. General requirements for PFAS sampling events must include one aqueous field blank per field event to be tested for PFASs to determine if water samples have been contaminated by sources unrelated to the project area and to assess the overall field procedures. The field blank is typically one bottle of PFAS-free water supplied by the laboratory, which is uncapped and poured into a second bottle. An equipment blank should be collected if non-dedicated equipment is used. For multi-day events, one blank per day per sample team should be collected, and for large events one blank per 10 or 20 samples is warranted, depending upon the project requirements. All blanks should be collected with laboratory supplied PFAS-free water. A source-water blank is handled like a trip blank and assesses the laboratory supplied water and sample containers. This blank may be warranted depending on DEP experience with the laboratory or sensitivity of the project.

Additionally, any QC samples that will be collected in the field that are required as part of laboratory QC requirements and to allow for data validation will be outlined.

8.0 REPORT GENERATION

All sampling activities must be documented as outlined in MEDEP/DR SOP# RWM-DR-013 - Documentation of Field Notes and Development of a Sampling Event Trip Report. A Sampling Event Trip Report (SETR) will be developed for every sampling event AND the staff person responsible for developing the SETR will be stated.

Attachment 2

Maine DEP Prequalified PFAS Laboratories

Current as of 7/16/2020

Laboratory	Matrices awarded
Absolute Resource Associates **124 Heritage Ave. Unit 16** **Portsmouth, NH 03801** **Contact: Aaron DeWees** **(603)436-2001** **aarond@absoluteresourceassociates.com**	**Drinking Water**
Alpha Analytical **72 Center Street** **Brewer, ME 04401** **Contact: Steve Knollmeyer** **(603)498-7213** **sknollmeyer@alphalab.com**	**Drinking Water** **Groundwater** **Surface Water** **Wastewater** **Soil** **Sediment** **Sludge/Compost** **Vegetative Material** **Tissue**
ALS Environmental **1317 13th Ave** **Kelso, WA 98626** **Contact: Howard Boorse** **(360)577-7222** **Howard.Boorse@alsglobal.com**	**Drinking Water** **Groundwater** **Surface Water** **Wastewater** **Soil** **Sediment** **Sludge/Compost**
Battelle **141 Longwater Drive, Suite 202** **Norwell, MA 02061** **Contact: Jonathan Thorn** **(781)681-5565** **thorn@battelle.org**	**Drinking Water** **Groundwater** **Surface Water** **Wastewater** **Soil** **Sediment** **Sludge/Compost** **Vegetative Material** **Tissue**
Con-Test Analytical Laboratory **39 Spruce Street** **East Longmeadow, MA 01028** **Contact: Jim Georgantas** **(413)525-2332** **jgeorgantas@contestlabs.com**	**Drinking Water** **Groundwater** **Surface Water** **Wastewater** **Soil**
EMSL Analytical **200 Route 130** **Cinnaminson, NJ 08077** **Contact: Robert DeMalo** **(856)858-4800**	**Drinking Water**

contracts@emsl.com	
Eurofins Lancaster Laboratories Environmental **2425 New Holland Pike** **Lancaster, PA 17601** **Contact: Jane Huber** **(717)209-1438** **JaneHuber@eurofinsus.com**	**Drinking Water** **Groundwater** **Surface Water** **Wastewater** **Soil** **Sediment** **Sludge/Compost** **Vegetative Material** **Tissue**
SGS AXYS Analytical Services **2045 Mills Road West** **Sidney, BC V8L 5X2** **Canada** **Contact: Nick Corso** **(781)799-5740** **Nicholas.Corso@sgs.com**	**Vegetative Material** **Tissue**
SGS North America **550 Business Dr.** **Wilmington, NC 28405** **Contact: Jeannie Milholland** **(910)667-0134** **Jeannie.milholland@sgs.com**	**Drinking Water**
TestAmerica Laboratories **880 Riverside Parkway** **West Sacramento, CA 95605** **Contact: Debby Wilson** **(949)237-0603** **Debby.wilson@testamericainc.com**	**Drinking Water** **Groundwater** **Surface Water** **Wastewater** **Soil** **Sediment** **Sludge/Compost** **Vegetative Material** **Tissue**
Vista Analytical Laboratories **1104 Windfield Way** **El Dorado Hills, CA 95762** **Contact: Jennifer Miller** **(916)673-1520** **jmiller@vista-analytical.com**	**Drinking Water** **Groundwater** **Surface Water** **Wastewater** **Soil** **Sediment** **Sludge/Compost** **Vegetative Material** **Tissue**

** Before arranging for testing, have the lab confirm that they can provide bottles, the shipping required, pricing, turn-around-times, and MEDEP suggests requesting an isotope dilution method with a full or standard reporting list, typically 18 – 28 compounds. Requesting an electronic data deliverable (EDD) in addition to the report in pdf format, will make it easier to summarize and sort results.