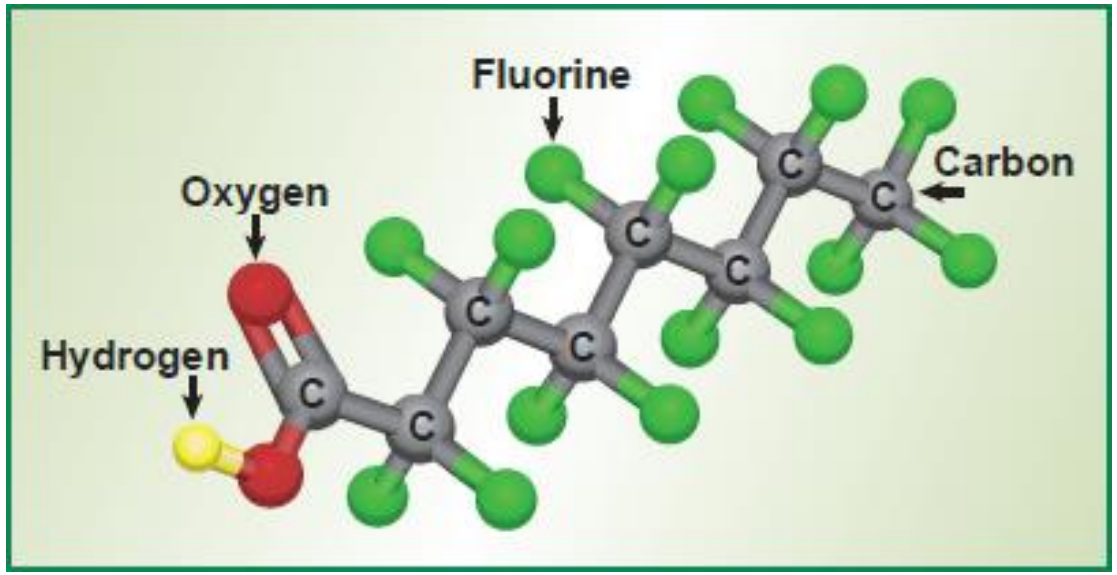
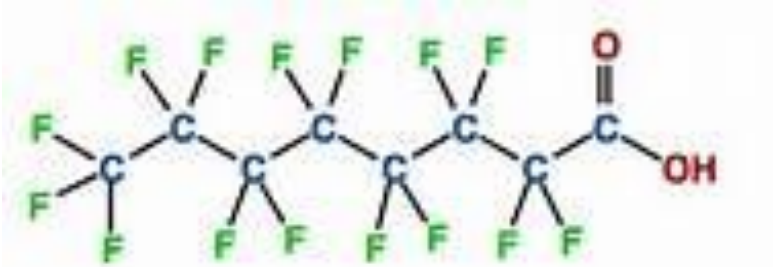
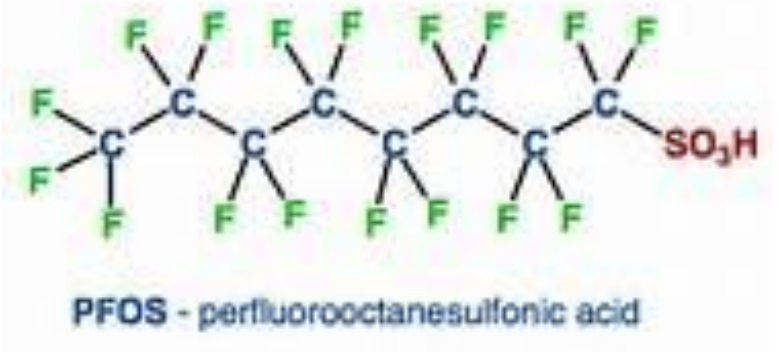
MeWEA 2022 Spring Conference
Collecting Samples for PFAS Analyses

April 1, 2022

Phyllis Arnold Rand, Water Quality Coordinator, Greater Augusta Utility District
prand@gaud.ws







HEALTH EFFECTS OF PFAS

Some, but not all, studies in humans with PFAS exposure have shown that certain PFAS **may**:

- Affect growth, learning, and behavior of infants and older children
- Lower a woman's chance of getting pregnant
- Interfere with the body's natural hormones
- Increase cholesterol levels
- Affect the immune system
- Increase the risk of cancer

Scientists are still learning about the health effects of exposures to mixtures of PFAS.

(Source: Agency for Toxic Substances and Disease Registry)

PART 1

Allowable vs. Prohibited Stuff

On the Day of PFAS Sampling--Phyllis's RULE OF THUMB

IF IT:

- ✓MAKES YOU LOOK GOOD
- ✓MAKES YOU SMELL GOOD
- ✓TASTES GOOD

✓IT'S PROBABLY ON THE "PROHIBITED ITEMS" LIST!

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

Prohibited Items	Acceptable Items
Field Equipment	
Teflon® containing materials. Aluminum foil.	High-density polyethylene (HDPE) and stainless steel materials
Storage of samples in containers made of LDPE materials	Acetate direct push liners
Teflon® tubing	Silicon or HDPE tubing
Waterproof field books. Water resistant sample bottle labels.	Loose paper (non-waterproof). Paper sample labels covered with clear packing tape.
Plastic clipboards, binders, or spiral hard cover notebooks	Aluminum or Masonite field clipboards
	Sharpies®, pens
Post-It Notes	
Chemical (blue) ice packs	Regular ice
Excel Purity Paste TFW Multipurpose Thread Sealant Vibra-Tite Thread Sealant	Gasoils NT Non-PTFE Thread Sealant Bentonite
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.)	
Field Clothing and PPE	
New clothing or water resistant, waterproof, or stain treated clothing, clothing laundered with fabric softeners, clothing containing Gore-TexTM	Well-laundered clothing, defined as clothing that has been washed 6 or more times after purchase, made of synthetic or natural fibers (preferable cotton)
Clothing laundered using fabric softener	No fabric softener
Boots containing Gore-TexTM	Boots made with polyurethane and PVC
	Reflective safety vests, ~~Tyvek®~~, Cotton Clothing, synthetic under clothing, body braces
No cosmetics, moisturizers, hand cream, or other related products as part of personal cleaning/showering routine on the morning of sampling	**Sunscreens** - Alba Organics Natural Sunscreen, Yes To Cucumbers, Aubrey Organics, Jason Natural Sun Block, Kiss my face, Baby sunscreens that are "free" or "natural" **Insect Repellents** - Jason Natural Quit Bugging Me, Repel Lemon Eucalyptus Insect repellant, Herbal Armor, California Baby Natural Bug Spray, BabyGanics

	Sunscreen and insect repellant - Avon Skin So Soft Bug Guard Plus – SPF 30 Lotion
Sample Containers	
LDPE, glass containers or passive diffusion bags.	HDPE (any media) or polypropylene (only for EPA Method 537 samples)
Teflon®-lined caps	Lined or unlined HDPE or polypropylene caps
Rain Events	
Waterproof or resistant rain gear	Polyurethane, vinyl, wax or rubber-coated rain gear. Gazebo tent that is only touched or moved prior to and following sampling activities
Equipment Decontamination	
Decon 90	Alconox® and/or Liquinox®
Water from an on-site well	Potable water from municipal drinking water supply (if tested as PFAS-free)
Food Considerations	
All food and drink, with exceptions noted on the right	Bottled water and hydration drinks (i.e. Gatorade® and Powerade®) to be brought and consumed only in the staging area

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 DI or PFAS-free water prior to use and between locations.

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:

Examples of:
MEDEP's Prohibited Field Clothing, Prohibited Personal Care Products and Prohibited PPE

Clothes laundered with fabric softeners, Vinyl Gloves,
Water-resistant clothing & shoes such as: Tyvek®, Gore-Tex™
Personal Care Products: Soap, Shampoo, Deodorant, Cosmetics, Hand Creams, etc.

Examples of:
MEDEP's Acceptable Field Clothing, Acceptable Personal Care Products and Acceptable PPE

Well-laundered clothing (washed 6 or more times), New Powderless Nitrile Gloves,
Cotton clothing preferable (including "undies")
Polyurethane and PVC boots, reflective Safety Vests, Certain Sunscreens and Certain Insect Repellents

Examples of MEDEP's Prohibited Field Equipment

LDPE Bottles

Teflon® Tubing

Teflon® Lined Bottle Caps

Post-it® Notes

Blue Ice Packs

Waterproof Field Books & Labels

Plastic Clipboards

Examples of MEDEP's Allowable Field Equipment

HDPE Sample Bottles from the Accredited Lab

Stainless Steel Material

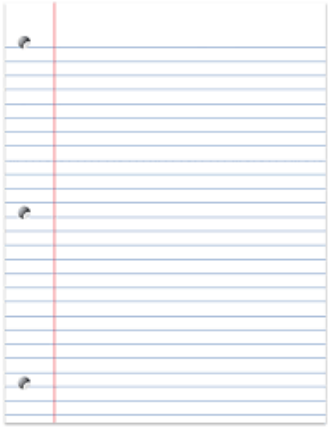
Pens, Sharpies®

Silicon or HDPE Tubing

Paper sample labels covered w/clear packing tape

Regular Ice

Loose paper (non-waterproof)



Masonite field clipboards

Examples of MEDEP's Prohibited Rain Event Items & Prohibited Equipment Decontamination Chemicals

Waterproof or Water-resistant Rain Gear

Water from an Onsite Well

Decon 90

Examples of MEDPE's Allowable Rain Event Items & Allowable Equipment Decontamination Chemicals

Polyurethane, Vinyl, Wax or Rubber-Coated Rain Gear

Gazebo Tent
(only touched or moved
before and after sampling activities)

Equipment Decontamination:
Alconox® and/or Liquinox®
Potable water from **PFAS-free** municipal drinking water supply

Examples of MEDEP's Allowable Food Considerations

Bottled Water and Hydration Drinks (examples below) must be brought and consumed **ONLY** in the staging area!!

Examples of MEDEP's Prohibited Food Considerations

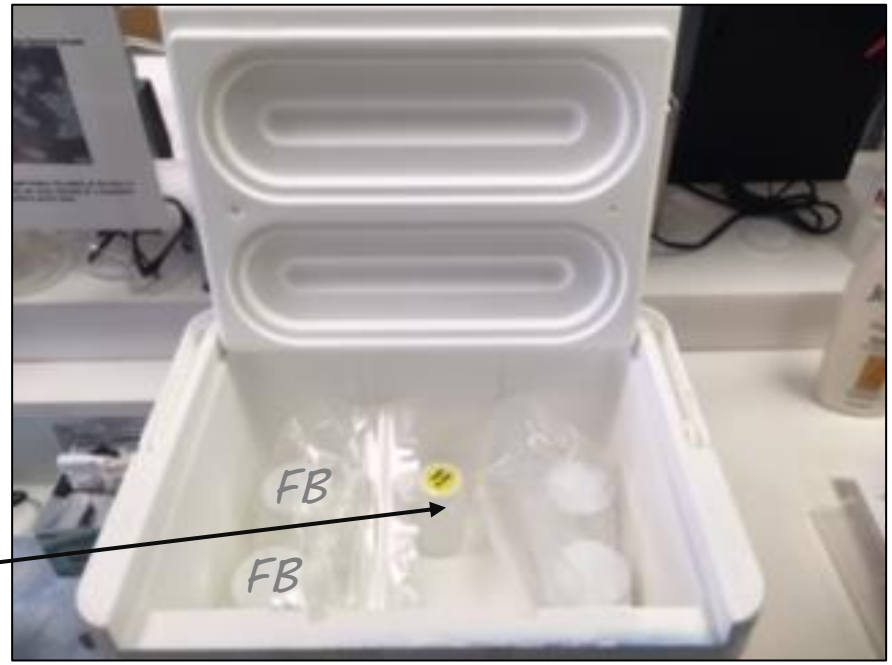
Everything Else!!!

PART 2

PFAS Sampling Kit

Lab-supplied PFAS Sampling Kit

- 1 Cooler
- 1 set of Sample Bottles, in a baggie, per sample location
- 1 set of Field Blank (FB) Bottles, in a baggie, per sample location
- Sampling Instructions
- Chain-of-Custody Form
- 1 Temperature Blank*



*__Temperature Blank__ stays in the cooler. The commercial lab will take the temperature of the water in the Temperature Blank upon receipt in the lab.

Temperature must be less than 10 Deg C (50 Deg F).

Instructions for filling out Alpha Analytical's Chain-of-Custody are on the back of the Chain-of-Custody

CHAIN OF CUSTODY

PAGE______ OF ______

ALPHA ANALYTICAL

WESTBORO, MA
TEL: 508-898-9220
FAX: 508-898-9193

MANSFIELD, MA
TEL: 508-822-9300
FAX: 508-822-3288

Date Rec'd in Lab:

ALPHA Job #:

Client Information

Client:

Address:

Phone:

Fax:

Email:

❑ These samples have been previously analyzed by Alpha

Project Information

Project Name:

Project Location:

Project #:

Project Manager:

ALPHA Quote #:

Turn-Around Time

❑ Standard ❑ RUSH *(only confirmed if pre-approved)*

Date Due: Time:

Report Information - Data Deliverables

❑ FAX ❑ EMAIL

❑ ADEx ❑ Add'l Deliverables

Regulatory Requirements/Report Limits

State /Fed Program

Billing Information

❑ Same as Client info PO #:

ANALYSIS

Other Project Specific Requirements/Comments/Detection Limits:

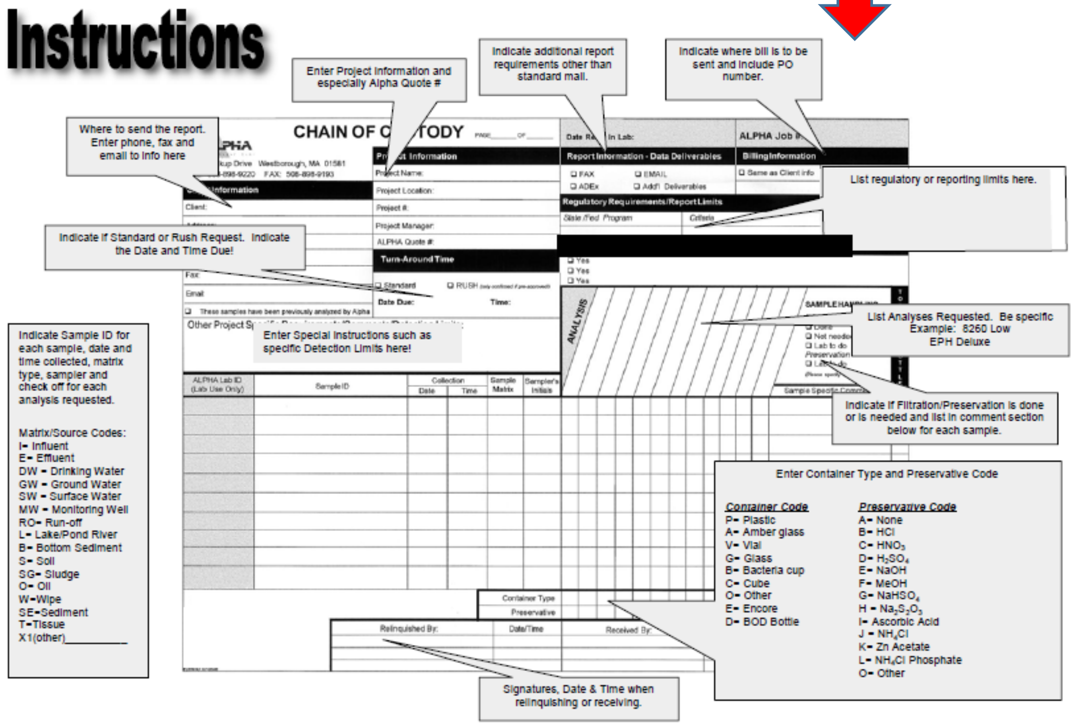
ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials

Container Type

Preservative

Relinquished By:	Date/Time	Received By:

FORM NO: 01-01 (rev. 14-OCT-07)



Terms & Conditions: In the absence of a written agreement to the contrary, this order constitutes an acceptance by the Client of Alpha Analytical, Inc. (ALPHA)'s offer to do business under these Terms and Conditions, and agrees to be bound by these conditions. Any terms and conditions from Client's that do not conform to the terms and conditions contained herein shall be deemed invalid and unenforceable, unless accepted in writing by ALPHA. This order shall not be valid unless it contains sufficient specifications to enable ALPHA to carry out the Client's requirements. Samples must be accompanied by: a) adequate instruction as to the quantity and type of analysis requested, and b) reporting and billing address information. Upon timely delivery of samples, ALPHA will use its best efforts to meet mutually agreed turnaround times, calculated from the point in time when ALPHA has determined that it can proceed with the defined work to be done (Sample Delivery Acceptance). ALPHA reserves the right, to refuse or revoke Sample Delivery Acceptance for any sample which in the sole judgment of ALPHA: a) is unsuitable volume; b) may pose a risk or become unsuitable for handling, transport or processing for any health , safety, environmental or any other reason; c) holding times cannot be met.

Client agrees to pay for all applicable charges to process this order. Payment in advance is required for all Clients except those whose credit has been established with ALPHA. For Clients with approved credit, payment terms are Net 30 days from the date of the invoice by ALPHA. All overdue payments are subject to an interest and service charge of one and one half percent (1.5%) (Or the maximum rate permissible by law, whichever is lesser) per month or portion thereof from the due date until the date of payment. ALPHA may suspend work and withhold delivery of data under this order at any time in the event that the Client fails to make timely payment of its invoices. Client shall be responsible for all costs and expenses of collection including reasonable attorney's fees. Data or information provided to ALPHA or generated by services performed under this agreement shall only become the property of the Client upon receipt in full by ALPHA of payment for the entire Order.

In no event shall ALPHA have any responsibility or liability to the Client for any failure or delay in performance by ALPHA which results, directly or indirectly in whole or in part, from any cause or circumstance beyond the reasonable control of ALPHA.

ALPHA shall dispose of the Client's samples 30 days after the analytical report is issued, unless instructed to store them for an alternate period of time or return such samples to the Client. The return of samples will be at the Client's own expense.

alphalab.com/index.php/support-services/chain-of-custody-forms

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800-624-9220

SUPPORT SERVICES / Chain of Custody Forms

Chain of Custody Forms

Alpha provides environmental testing Chain of Custody (COC) templates for routine and air analysis to assist our clients from container requests to sample submission. These templates can be downloaded to your computer, filled out with your specific company and contact information and stored on your PC for all your future projects.

When you are planning a specific project, the chain of custody form template can be called up and filled in with specific project information and stored on your PC. This project COC can then be sent to Alpha Client Services as a bottle order request. In addition, we will transfer any project-specific information you provide on the COC to the container labels that will subsequently be sent to you for your sampling event. Alpha can also provide copies of this project COC along with your bottle order for your convenience.

In these ways, the Alpha's environmental testing chain of custody form templates function as a multipurpose document, saving you time by reducing the number of steps you need to do.

Click on the links below to download a COC template. Use the MS Excel or MS Word version to create your own documents.

AIR ANALYSIS

Air Chain of Custody Form (Word)

Air Chain of Custody Form (PDF)

Air Chain of Custody Form Instructions (PDF)

Air-Sorbent Media Chain of Custody (Excel field fillable)

How To Complete a Chain of Custody Form

What Our Clients Are Saying

"From bottle ordering to courier service to final deliverables, every Alpha staff involved with…»»

Support Services

Alpha's air canister inventory keeps growing; we now have over 1,000 of the latest technology Fused-Silica-Lined

PART 3

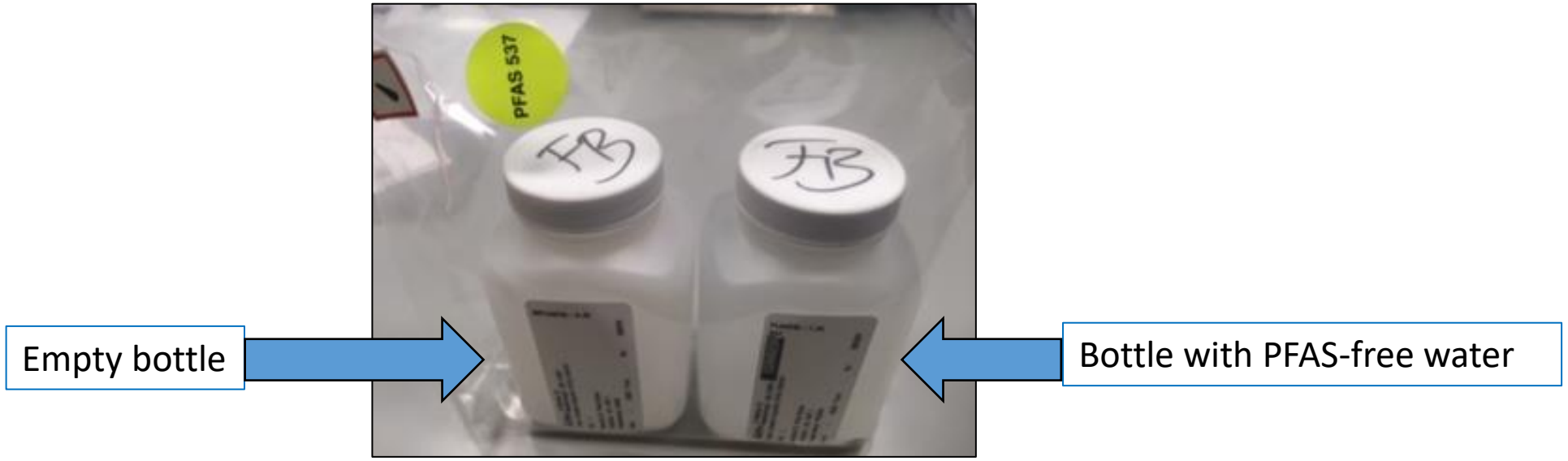
PFAS & Field Blank Sampling

How to Collect the PFAS Grab Sample (Phyllis's suggestions)

1. Wash an HDPE pitcher with Alconox® or Liquinox® and PFAS-free hot tap water. Store in closable baggie until ready to use.
2. Don your "approved" clothing, gloves, etc.
3. Bring the cooler, a rope w/stainless-steel hook, HDPE pitcher, uncoated paper towels, clip board and ink pen to effluent compliance sampling point.
4. Lower the pitcher with a rope into the effluent channel. Collect the sample in the pitcher.
5. Remove caps from sample bottles and place them face-up on uncoated paper towel.
6. Fill sample bottles to the "necks" but be careful not to overfill. Replace caps and invert bottles 5 times to mix preservative (if supplied).
7. Write sample date, time, analyst ID on bottle labels.
8. Return filled bottles to baggie. Seal the baggie.
9. Fill-out Chain-of-Custody and put it in its own baggie.
10. Proceed to "Field Blank Sampling."

What is a “Field Blank”?

- The Field Blank (FB) identifies possible PFAS contamination introduced during sample collection and handling at each sampling location.
- A bottle of PFAS-free water and an empty bottle are supplied by the lab.

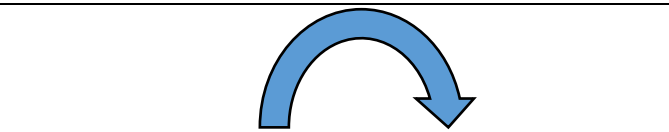


How to Collect a Field Blank

- **Step 1:** Don nitrile gloves. Open the bottle containing the PFAS-free water and put the cap, face-up, on a clean surface such as non-coated paper towels. Open the "Empty" bottle and keep the cap in your hand.
- **Step 2:** Pour all of the PFAS-free water into the "Empty" bottle and screw on the cap from your hand. Gently invert the bottle 5 times to mix the water with the preservative (if supplied) in the bottle. Screw the other cap onto the now-empty bottle.
- **Step 3:** Fill-in the labels on the bottles. **You will return the empty bottle with your samples.** Put both bottles into the baggie. Seal the baggie. Put into cooler.
- **Step 4**: Enter info on the Chain-of-Custody Form.

  NOTE: Any Equipment Blanks should be collected by rinsing non-dedicated sampling equipment with PFAS-free water.

Pour PFAS-free H2O into the Empty Bottle



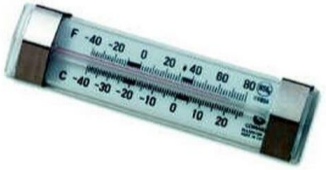
PFAS-free water Empty Bottle

Back View

TABLE 2
Media/Analytical Methodology

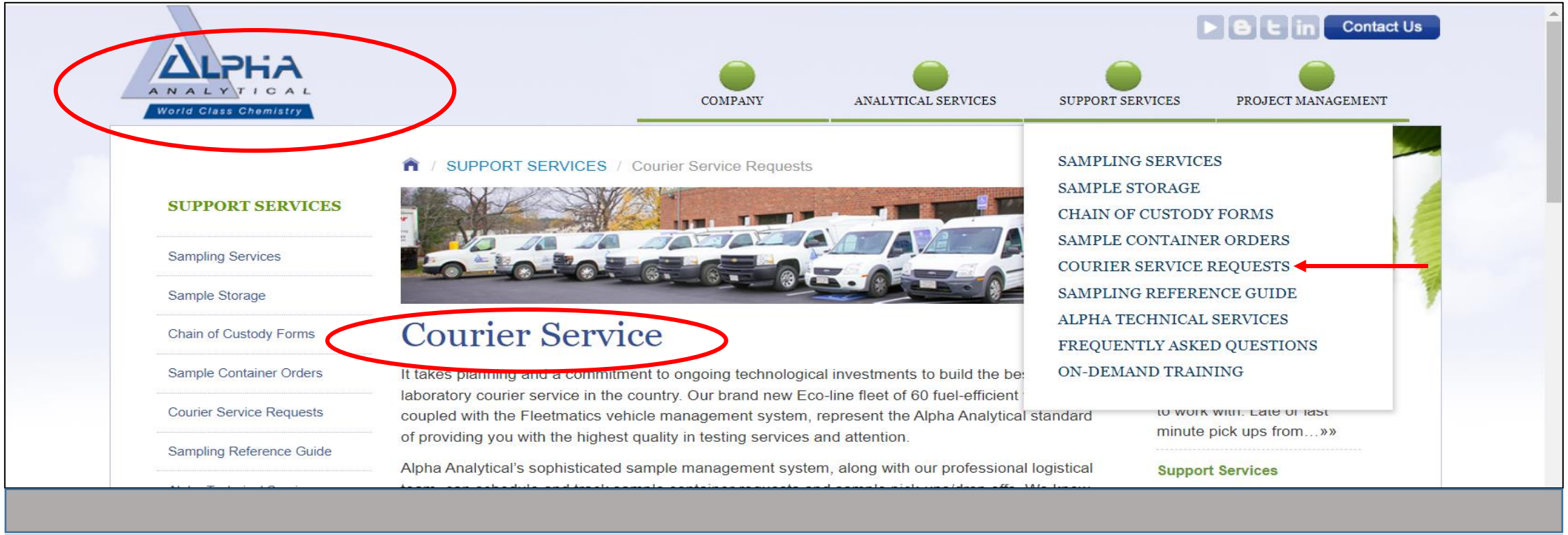
MEDIA	LABORATORY METHOD	HOLD TIME*/ PRESERVATION	ANALYSIS TIME	Reporting List
Drinking Water	USEPA Method 537	14 days to extraction/Trizma**	28 days after extraction	Method specific
Groundwater	Modified Method 537	14 days to extraction/<6°C	28 days after extraction	DEP Minibid list ***
Surface Water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

Sample Storage & Shipping



- Call or email lab to arrange sample pick-up.
- Make sure baggies containing samples are completely sealed.
- Samples stored after 48 hrs. of collection must be refrigerated at or below 6 Deg C (43 Deg F). Keep Temp Blank with the samples.
- Add **ice** to cooler(s) to keep samples cool during transport to lab.
- Put chain-of-custody in baggie. Set it on top of the sample cooler.
- “Sign-over” the samples to the lab courier.

(FYI: Lab courier usually shows up with ice.)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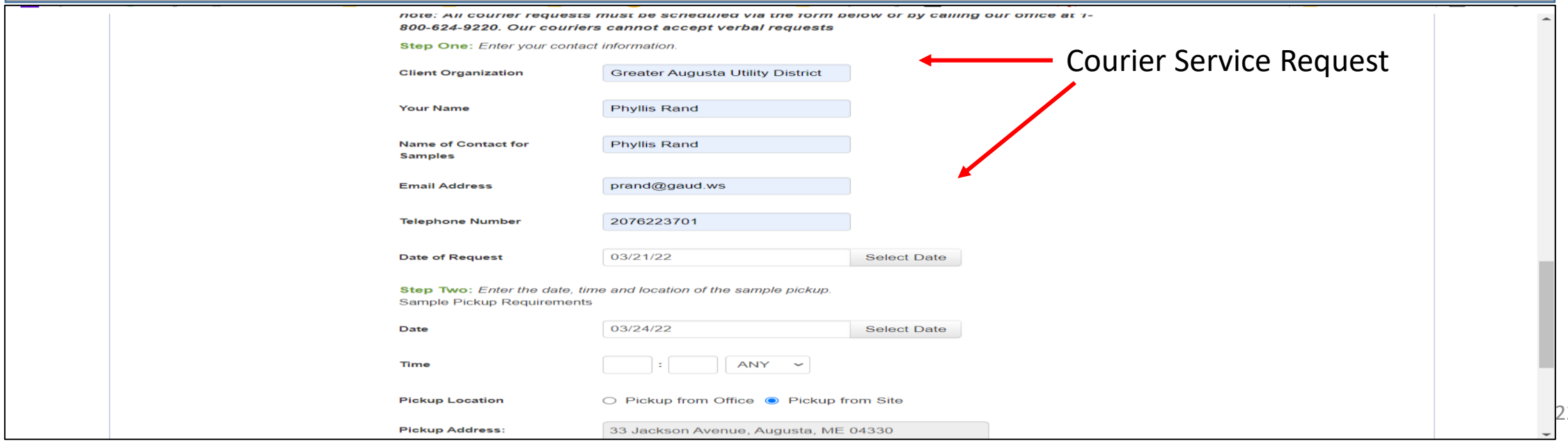

Courier Service Request
Step One: Enter your contact information.
Client Organization
Greater Augusta Utility District
Your Name
Phyllis Rand
Name of Contact for Samples
Phyllis Rand
Email Address
prand@gaud.ws
Telephone Number
2076223701
Date of Request
03/21/22
Select Date
Step Two: Enter the date, time and location of the sample pickup.
Sample Pickup Requirements
Date
03/24/22
Select Date
Time
ANY
Pickup Location
Pickup from Office
Pickup from Site
Pickup Address:
33 Jackson Avenue, Augusta, ME 04330

Serial_No:03252219:58

Project Name: 2022 PFAS
Project Number: Not Specified

Lab Number: L2213990
Report Date: 03/25/22

SAMPLE RESULTS

Lab ID: L2213990-01
Client ID: RIVERSIDE STATION
Sample Location: TRIANGLE & RIVERSIDE

Sample Depth:
Matrix: Dw
Analytical Method: 133,537.1
Analytical Date: 03/23/22 10:03
Analyst: AC

Date Collected: 03/15/22 10:45
Date Received: 03/17/22
Field Prep: Not Specified

Extraction Method: EPA 537.1
Extraction Date: 03/22/22 17:10

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 537.1 - Mansfield Lab						
Perfluoroheptanoic Acid (PFHpA)	2.61		ng/l	1.84	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.84	--	1
Perfluorooctanoic Acid (PFOA)	4.44		ng/l	1.84	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.84	--	1
Perfluorooctanesulfonic Acid (PFOS)	3.49		ng/l	1.84	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.84	--	1
PFAS, Total (6)	10.5		ng/l	1.84	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Perfluoro-n-[1,2-13C2]hexanoic Acid (13C-PFHxA)	91		70-130
Tetrafluoro-2-heptafluoropropoxy-[13C3]-propanoic acid (13C3-HFPO-DA)	100		70-130
Perfluoro-n-[1,2-13C2]decanoic Acid (13C-PFDA)	80		70-130
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	102		70-130

Serial_No:03252219:58

Project Name: 2022 PFAS
Project Number: Not Specified

Lab Number: L2213990
Report Date: 03/25/22

SAMPLE RESULTS

Lab ID: L2213990-02
Client ID: RS FIELD BLANK
Sample Location: TRIANGLE & RIVERSIDE

Sample Depth:
Matrix: Dw
Analytical Method: 133,537.1
Analytical Date: 03/23/22 10:12
Analyst: AC

Date Collected: 03/15/22 10:45
Date Received: 03/17/22
Field Prep: Not Specified

Extraction Method: EPA 537.1
Extraction Date: 03/22/22 17:10

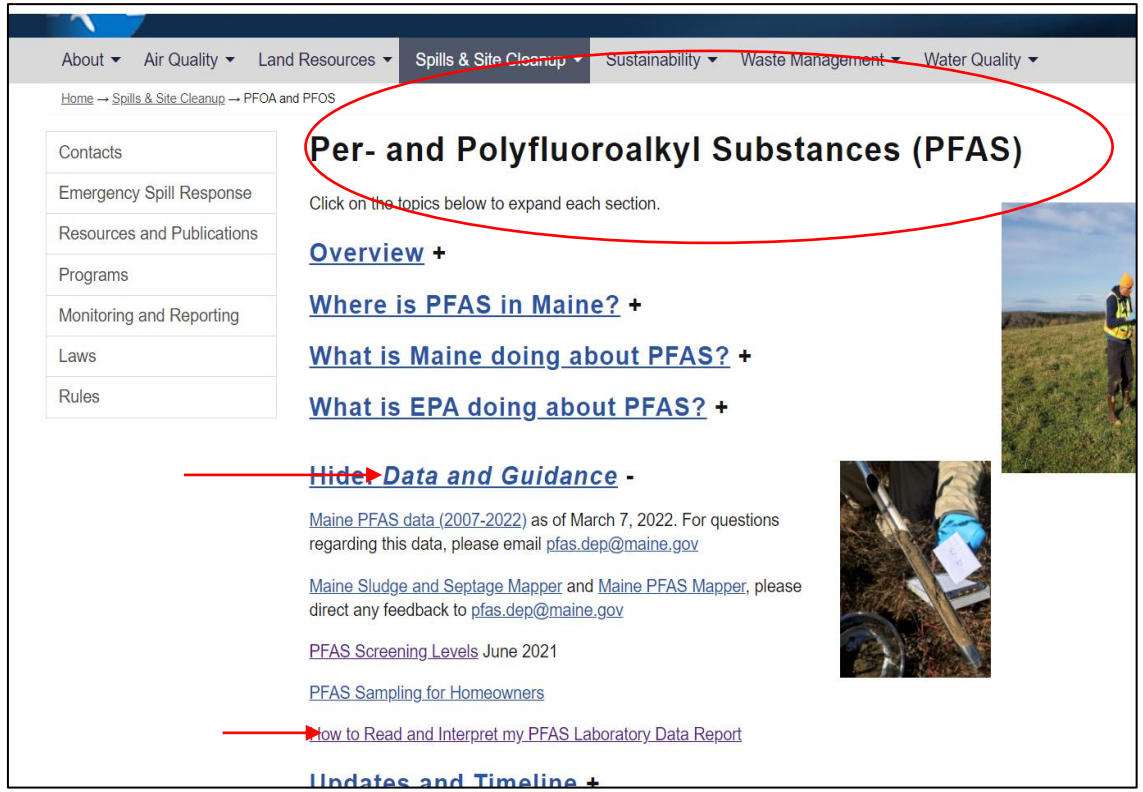
Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 537.1 - Mansfield Lab						
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.88	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.88	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.88	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.88	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.88	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.88	--	1
PFAS, Total (6)	ND		ng/l	1.88	--	1

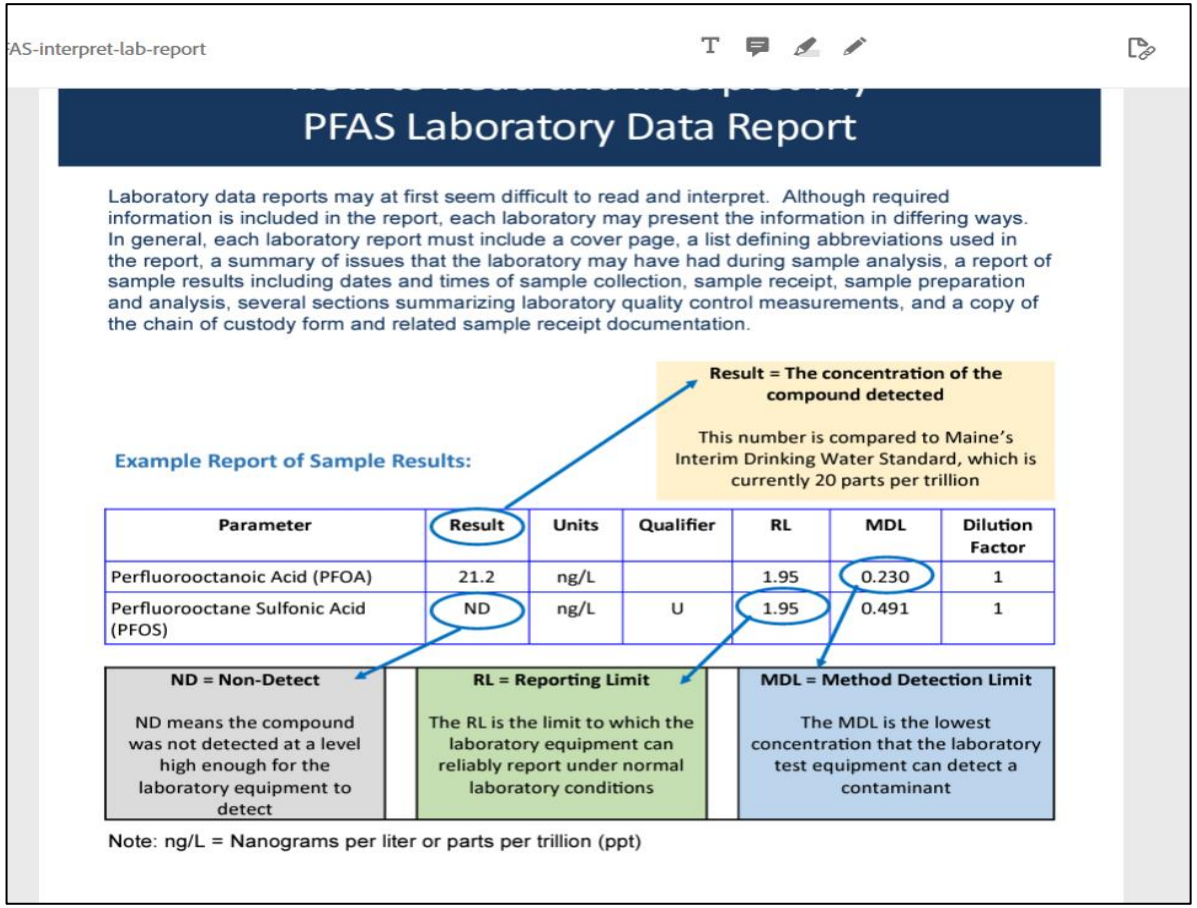
Surrogate	% Recovery	Qualifier	Acceptance Criteria
Perfluoro-n-[1,2-13C2]hexanoic Acid (13C-PFHxA)	87		70-130
Tetrafluoro-2-heptafluoropropoxy-[13C3]-propanoic acid (13C3-HFPO-DA)	97		70-130
Perfluoro-n-[1,2-13C2]decanoic Acid (13C-PFDA)	86		70-130
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	104		70-130

ADDITIONAL INFORMATION:

"Per- and Polyfluoroalkyl Substances (PFAS)." Data and Guidance. "How to Read and Interpret my PFAS Laboratory Data Report." Online. https://tinyurl.com/MEDEPPFAS

"How to Read and Interpret my PFAS Laboratory Data Report"





Thanks for Your Time
&
Happy Sampling!!!

Phyllis Arnold Rand, Greater Augusta Utility District
prand@gaud.ws