



ANALYTICAL REPORT

Lab Number:	L2170029
Client:	Massachusetts DEP 20 Riverside Drive Lakeville, MA 02347-1676
ATTN:	Jennifer Wharff
Phone:	(508) 946-2803
Project Name:	BRH
Project Number:	102064
Report Date:	01/18/22

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Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2170029-01	BRAINTREE-1	WATER	42.2020729, -71.0242916	12/20/21 09:10	12/20/21
L2170029-02	FIELD BLANK	WATER	42.2020729, -71.0242916	12/20/21 09:12	12/20/21
L2170029-03	BRAINTREE-2	WATER	42.2020729, -71.0242916	12/20/21 09:40	12/20/21
L2170029-04	FIELD BLANK	WATER	42.2020729, -71.0242916	12/20/21 09:42	12/20/21

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
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Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

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Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Sample Receipt

The samples were received at the laboratory above the required temperature range. The samples were transported to the laboratory in a cooler with ice and delivered directly from the sampling site. This is considered acceptable since the samples were in the process of cooling.

Perfluorinated Alkyl Acids by EPA 533

WG1592307-2R: The sample was re-analyzed due to QC failures in the original analysis. The results of the re-analysis are reported.

The WG1592307-3 MS recoveries, performed on L2170029-01, are outside the acceptance criteria for perfluoro-3-methoxypropanoic acid (pfmpa) (69%).

The WG1592307-4 Laboratory Duplicate RPD for perfluorobutanoic acid (pfba) (64%) and perfluorooctanesulfonic acid (pfos) (129%), performed on L2170029-03, is outside the acceptance criteria. The elevated RPD has been attributed to the non-homogeneous nature of the native sample.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Alycia Mogayzel

Title: Technical Director/Representative

Date: 01/18/22

ORGANICS

SEMIVOLATILES

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

SAMPLE RESULTS

Lab ID: L2170029-01
Client ID: BRAINTREE-1
Sample Location: 42.2020729, -71.0242916

Date Collected: 12/20/21 09:10
Date Received: 12/20/21
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 136,533
Analytical Date: 01/17/22 17:42
Analyst: JW

Extraction Method: EPA 533
Extraction Date: 01/10/22 12:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	7.29		ng/l	1.97	0.658	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.97	0.658	1
Perfluoropentanoic Acid (PFPeA)	2.76		ng/l	1.97	0.658	1
Perfluorobutanesulfonic Acid (PFBS)	2.68		ng/l	1.97	0.658	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.97	0.658	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.97	0.658	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.97	0.658	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.97	0.658	1
Perfluorohexanoic Acid (PFHxA)	2.84		ng/l	1.97	0.658	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.97	0.658	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.97	0.658	1
Perfluoroheptanoic Acid (PFHpA)	2.05		ng/l	1.97	0.658	1
Perfluorohexanesulfonic Acid (PFHxS)	2.95		ng/l	1.97	0.658	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.97	0.658	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.97	0.658	1
Perfluorooctanoic Acid (PFOA)	6.66		ng/l	1.97	0.658	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.97	0.658	1
Perfluorononanoic Acid (PFNA)	0.670	J	ng/l	1.97	0.658	1
Perfluorooctanesulfonic Acid (PFOS)	5.28		ng/l	1.97	0.988	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.97	0.658	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.97	0.658	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.97	0.658	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.97	0.658	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.97	0.658	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.97	0.658	1

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

SAMPLE RESULTS

Lab ID: L2170029-01
 Client ID: BRAINTREE-1
 Sample Location: 42.2020729, -71.0242916

Date Collected: 12/20/21 09:10
 Date Received: 12/20/21
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C4]Butanoic Acid (MPFBA)			95		50-200	
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)			84		50-200	
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)			82		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)			158		50-200	
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)			71		50-200	
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)			75		50-200	
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)			94		50-200	
Perfluoro[13C8]Octanoic Acid (M8PFOA)			88		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)			156		50-200	
Perfluoro[13C9]Nonanoic Acid (M9PFNA)			89		50-200	
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)			94		50-200	
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)			84		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)			116		50-200	
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)			86		50-200	
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)			89		50-200	
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)			52		50-200	

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

SAMPLE RESULTS

Lab ID: L2170029-02
 Client ID: FIELD BLANK
 Sample Location: 42.2020729, -71.0242916

Date Collected: 12/20/21 09:12
 Date Received: 12/20/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 01/17/22 17:59
 Analyst: JW

Extraction Method: EPA 533
 Extraction Date: 01/10/22 12:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.96	0.656	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.96	0.656	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.96	0.656	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.96	0.656	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.96	0.656	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.96	0.656	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.96	0.656	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.96	0.656	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.96	0.656	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.96	0.656	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.96	0.656	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.96	0.656	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.96	0.656	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.96	0.656	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.96	0.656	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.96	0.656	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.96	0.656	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.96	0.656	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.96	0.986	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.96	0.656	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.96	0.656	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.96	0.656	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.96	0.656	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.96	0.656	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.96	0.656	1

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

SAMPLE RESULTS

Lab ID: L2170029-02
 Client ID: FIELD BLANK
 Sample Location: 42.2020729, -71.0242916

Date Collected: 12/20/21 09:12
 Date Received: 12/20/21
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C4]Butanoic Acid (MPFBA)			94		50-200	
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)			99		50-200	
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)			86		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)			103		50-200	
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)			110		50-200	
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)			95		50-200	
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)			79		50-200	
Perfluoro[13C8]Octanoic Acid (M8PFOA)			101		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)			74		50-200	
Perfluoro[13C9]Nonanoic Acid (M9PFNA)			105		50-200	
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)			84		50-200	
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)			106		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)			87		50-200	
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)			103		50-200	
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)			109		50-200	
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)			81		50-200	

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

SAMPLE RESULTS

Lab ID: L2170029-03
 Client ID: BRAINTREE-2
 Sample Location: 42.2020729, -71.0242916

Date Collected: 12/20/21 09:40
 Date Received: 12/20/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 01/17/22 18:08
 Analyst: JW

Extraction Method: EPA 533
 Extraction Date: 01/10/22 12:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	4.54		ng/l	1.87	0.626	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.87	0.626	1
Perfluoropentanoic Acid (PFPeA)	2.81		ng/l	1.87	0.626	1
Perfluorobutanesulfonic Acid (PFBS)	1.24	J	ng/l	1.87	0.626	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.87	0.626	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.87	0.626	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.87	0.626	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.87	0.626	1
Perfluorohexanoic Acid (PFHxA)	2.81		ng/l	1.87	0.626	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.87	0.626	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.87	0.626	1
Perfluoroheptanoic Acid (PFHpA)	1.61	J	ng/l	1.87	0.626	1
Perfluorohexanesulfonic Acid (PFHxS)	1.46	J	ng/l	1.87	0.626	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.87	0.626	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.87	0.626	1
Perfluorooctanoic Acid (PFOA)	4.61		ng/l	1.87	0.626	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.87	0.626	1
Perfluorononanoic Acid (PFNA)	0.825	J	ng/l	1.87	0.626	1
Perfluorooctanesulfonic Acid (PFOS)	21.0		ng/l	1.87	0.941	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.87	0.626	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.87	0.626	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.87	0.626	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.87	0.626	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.87	0.626	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.87	0.626	1

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

SAMPLE RESULTS

Lab ID: L2170029-03
 Client ID: BRAINTREE-2
 Sample Location: 42.2020729, -71.0242916

Date Collected: 12/20/21 09:40
 Date Received: 12/20/21
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C4]Butanoic Acid (MPFBA)			98		50-200	
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)			88		50-200	
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)			85		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)			175		50-200	
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)			77		50-200	
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)			80		50-200	
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)			96		50-200	
Perfluoro[13C8]Octanoic Acid (M8PFOA)			88		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)			129		50-200	
Perfluoro[13C9]Nonanoic Acid (M9PFNA)			100		50-200	
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)			84		50-200	
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)			98		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)			97		50-200	
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)			99		50-200	
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)			101		50-200	
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)			64		50-200	

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

SAMPLE RESULTS

Lab ID: L2170029-04
 Client ID: FIELD BLANK
 Sample Location: 42.2020729, -71.0242916

Date Collected: 12/20/21 09:42
 Date Received: 12/20/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 01/17/22 18:25
 Analyst: JW

Extraction Method: EPA 533
 Extraction Date: 01/10/22 12:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.97	0.659	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.97	0.659	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.97	0.659	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.97	0.659	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.97	0.659	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.97	0.659	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.97	0.659	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.97	0.659	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.97	0.659	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.97	0.659	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.97	0.659	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.97	0.659	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.97	0.659	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.97	0.659	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.97	0.659	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.97	0.659	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.97	0.659	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.97	0.659	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.97	0.990	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.97	0.659	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.97	0.659	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.97	0.659	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.97	0.659	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.97	0.659	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.97	0.659	1

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

SAMPLE RESULTS

Lab ID: L2170029-04
 Client ID: FIELD BLANK
 Sample Location: 42.2020729, -71.0242916

Date Collected: 12/20/21 09:42
 Date Received: 12/20/21
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	100		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	107		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	112		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	92		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	116		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	116		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	109		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	104		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	91		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	108		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	98		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	108		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	94		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	110		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	129		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	91		50-200

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 136,533
Analytical Date: 01/17/22 16:49
Analyst: JW

Extraction Method: EPA 533
Extraction Date: 01/10/22 12:05

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab for sample(s): 01-04 Batch: WG1592307-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	0.668
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	2.00	0.668
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	0.668
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	0.668
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	2.00	0.668
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEEESA)	ND		ng/l	2.00	0.668
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	2.00	0.668
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	0.668
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	2.00	0.668
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	2.00	0.668
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	0.668
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	0.668
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.00	0.668
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	0.668
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	0.668
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	0.668
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	1.00
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	0.668
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	0.668
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	0.668
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	2.00	0.668
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	0.668

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 136,533
Analytical Date: 01/17/22 16:49
Analyst: JW

Extraction Method: EPA 533
Extraction Date: 01/10/22 12:05

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab for sample(s): 01-04 Batch: WG1592307-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	100		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	107		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	98		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	94		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	96		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	99		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	94		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	105		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	83		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	106		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	88		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	96		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	104		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	114		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	115		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	81		50-200

Lab Control Sample Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

Parameter	LCS	Qual	LCS	Qual	%Recovery	RPD	Qual	RPD
	%Recovery		%Recovery		Limits			Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-04 Batch: WG1592307-2								
Perfluorobutanoic Acid (PFBA)	102		-		70-130	-		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	108		-		70-130	-		30
Perfluoropentanoic Acid (PFPeA)	104		-		70-130	-		30
Perfluorobutanesulfonic Acid (PFBS)	104		-		70-130	-		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	104		-		70-130	-		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEEESA)	95		-		70-130	-		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	82		-		70-130	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	114		-		70-130	-		30
Perfluorohexanoic Acid (PFHxA)	117		-		70-130	-		30
Perfluoropentanesulfonic Acid (PFPeS)	98		-		70-130	-		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	106		-		70-130	-		30
Perfluoroheptanoic Acid (PFHpA)	94		-		70-130	-		30
Perfluorohexanesulfonic Acid (PFHxS)	119		-		70-130	-		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	109		-		70-130	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	127		-		70-130	-		30
Perfluorooctanoic Acid (PFOA)	114		-		70-130	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	124		-		70-130	-		30
Perfluorononanoic Acid (PFNA)	107		-		70-130	-		30
Perfluorooctanesulfonic Acid (PFOS)	105		-		70-130	-		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	122		-		70-130	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	114		-		70-130	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

Parameter	LCS		LCSD		%Recovery Limits	RPD	RPD	
	%Recovery	Qual	%Recovery	Qual			Qual	Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-04 Batch: WG1592307-2								
Perfluorodecanoic Acid (PFDA)	115		-		70-130	-		30
Perfluoroundecanoic Acid (PFUnA)	106		-		70-130	-		30
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	111		-		70-130	-		30
Perfluorododecanoic Acid (PFDoA)	110		-		70-130	-		30

Surrogate (Extracted Internal Standard)	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
Perfluoro[13C4]Butanoic Acid (MPFBA)	94				50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	104				50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	87				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	89				50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	90				50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	96				50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	87				50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	98				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	78				50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	98				50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	79				50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	102				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	86				50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	104				50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	115				50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	89				50-200

Matrix Spike Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1592307-3 QC Sample: L2170029-01 Client ID:												
BRAINTREE-1												
Perfluorobutanoic Acid (PFBA)	7.29	39.3	42.5	90		-	-		70-130	-		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND	39.3	27.1	69	Q	-	-		70-130	-		30
Perfluoropentanoic Acid (PFPeA)	2.76	39.3	39.4	93		-	-		70-130	-		30
Perfluorobutanesulfonic Acid (PFBS)	2.68	34.9	36.8	98		-	-		70-130	-		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND	39.3	39.8	101		-	-		70-130	-		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEEESA)	ND	35	36.5	104		-	-		70-130	-		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND	39.3	35.0	89		-	-		70-130	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	36.8	43.4	118		-	-		70-130	-		30
Perfluorohexanoic Acid (PFHxA)	2.84	39.3	49.7	119		-	-		70-130	-		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	36.9	35.0	95		-	-		70-130	-		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND	39.3	34.7	88		-	-		70-130	-		30
Perfluoroheptanoic Acid (PFHpA)	2.05	39.3	48.0	117		-	-		70-130	-		30
Perfluorohexanesulfonic Acid (PFHxS)	2.95	35.8	34.7	89		-	-		70-130	-		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	37.1	33.4	90		-	-		70-130	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	37.4	46.1	123		-	-		70-130	-		30
Perfluorooctanoic Acid (PFOA)	6.66	39.3	53.4	119		-	-		70-130	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	37.5	39.9	106		-	-		70-130	-		30
Perfluorononanoic Acid (PFNA)	0.670J	39.3	40.5	103		-	-		70-130	-		30
Perfluorooctanesulfonic Acid (PFOS)	5.28	36.5	41.3	99		-	-		70-130	-		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND	36.7	37.5	102		-	-		70-130	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	37.7	46.1	122		-	-		70-130	-		30

Matrix Spike Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1592307-3 QC Sample: L2170029-01 Client ID: BRAINTREE-1												
Perfluorodecanoic Acid (PFDA)	ND	39.3	41.6	106		-	-		70-130	-		30
Perfluoroundecanoic Acid (PFUnA)	ND	39.3	45.6	116		-	-		70-130	-		30
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND	37.1	34.8	94		-	-		70-130	-		30
Perfluorododecanoic Acid (PFDoA)	ND	39.3	39.0	99		-	-		70-130	-		30

<i>Surrogate (Extracted Internal Standard)</i>	<i>MS % Recovery</i>	<i>MS Qualifier</i>	<i>MSD % Recovery</i>	<i>MSD Qualifier</i>	<i>Acceptance Criteria</i>
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	91				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	155				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	126				50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	65				50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	91				50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	93				50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	73				50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	89				50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	98				50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	99				50-200
Perfluoro[13C4]Butanoic Acid (MPFBA)	97				50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	92				50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	91				50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	93				50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	98				50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	79				50-200

Lab Duplicate Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1592307-4 QC Sample: L2170029-03 Client ID: BRAINTREE-2						
Perfluorobutanoic Acid (PFBA)	4.54	4.97	ng/l	9		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND	ND	ng/l	NC		30
Perfluoropentanoic Acid (PFPeA)	2.81	3.00	ng/l	7		30
Perfluorobutanesulfonic Acid (PFBS)	1.24J	1.18J	ng/l	NC		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND	ND	ng/l	NC		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND	ND	ng/l	NC		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	ND	ng/l	NC		30
Perfluorohexanoic Acid (PFHxA)	2.81	2.56	ng/l	9		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	ND	ng/l	NC		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND	ND	ng/l	NC		30
Perfluoroheptanoic Acid (PFHpA)	1.61J	1.54J	ng/l	NC		30
Perfluorohexanesulfonic Acid (PFHxS)	1.46J	1.62J	ng/l	NC		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	ND	ng/l	NC		30
Perfluorooctanoic Acid (PFOA)	4.61	3.79	ng/l	20		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	ND	ng/l	NC		30
Perfluorononanoic Acid (PFNA)	0.825J	ND	ng/l	NC		30
Perfluorooctanesulfonic Acid (PFOS)	21.0	4.54	ng/l	129	Q	30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND	ND	ng/l	NC		30

Lab Duplicate Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1592307-4 QC Sample: L2170029-03 Client ID: BRAINTREE-2						
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	ND	ng/l	NC		30
Perfluorodecanoic Acid (PFDA)	ND	ND	ng/l	NC		30
Perfluoroundecanoic Acid (PFUnA)	ND	ND	ng/l	NC		30
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND	ND	ng/l	NC		30
Perfluorododecanoic Acid (PFDoA)	ND	ND	ng/l	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	98		92		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	88		90		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	85		78		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	175		153		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	77		74		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	80		85		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	96		94		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	88		83		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	129		124		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	100		90		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	84		86		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	98		85		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	97		95		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	99		80		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	101		88		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	64		63		50-200

Project Name: BRH
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Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information

Cooler **Custody Seal**
A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2170029-01A	Plastic 250ml Ammonium Acetate preserved	A	NA		11.0	Y	Absent		A2-533(28)
L2170029-01B	Plastic 250ml Ammonium Acetate preserved	A	NA		11.0	Y	Absent		A2-533(28)
L2170029-02A	Plastic 250ml Ammonium Acetate preserved	A	NA		11.0	Y	Absent		A2-533(28)
L2170029-03A	Plastic 250ml Ammonium Acetate preserved	A	NA		11.0	Y	Absent		A2-533(28)
L2170029-03B	Plastic 250ml Ammonium Acetate preserved	A	NA		11.0	Y	Absent		A2-533(28)
L2170029-04A	Plastic 250ml Ammonium Acetate preserved	A	NA		11.0	Y	Absent		A2-533(28)

Project Name: BRH
Project Number: 102064

Serial_No:01182214:11
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Report Date: 01/18/22

PFAS PARAMETER SUMMARY

Parameter	Acronym	CAS Number
PERFLUOROALKYL CARBOXYLIC ACIDS (PFCAs)		
Perfluorooctadecanoic Acid	PFODA	16517-11-6
Perfluorohexadecanoic Acid	PFHxDA	67905-19-5
Perfluorotetradecanoic Acid	PFTA	376-06-7
Perfluorotridecanoic Acid	PFTrDA	72629-94-8
Perfluorododecanoic Acid	PFDoA	307-55-1
Perfluoroundecanoic Acid	PFUnA	2058-94-8
Perfluorodecanoic Acid	PFDA	335-76-2
Perfluorononanoic Acid	PFNA	375-95-1
Perfluorooctanoic Acid	PFOA	335-67-1
Perfluoroheptanoic Acid	PFHpA	375-85-9
Perfluorohexanoic Acid	PFHxA	307-24-4
Perfluoropentanoic Acid	PFPeA	2706-90-3
Perfluorobutanoic Acid	PFBA	375-22-4
PERFLUOROALKYL SULFONIC ACIDS (PFSAs)		
Perfluorododecanesulfonic Acid	PFDoDS	79780-39-5
Perfluorodecanesulfonic Acid	PFDS	335-77-3
Perfluorononanesulfonic Acid	PFNS	68259-12-1
Perfluorooctanesulfonic Acid	PFOS	1763-23-1
Perfluoroheptanesulfonic Acid	PFHpS	375-92-8
Perfluorohexanesulfonic Acid	PFHxS	355-46-4
Perfluoropentanesulfonic Acid	PFPeS	2706-91-4
Perfluorobutanesulfonic Acid	PFBS	375-73-5
FLUOROTELOMERS		
1H,1H,2H,2H-Perfluorododecanesulfonic Acid	10:2FTS	120226-60-0
1H,1H,2H,2H-Perfluorodecanesulfonic Acid	8:2FTS	39108-34-4
1H,1H,2H,2H-Perfluorooctanesulfonic Acid	6:2FTS	27619-97-2
1H,1H,2H,2H-Perfluorohexanesulfonic Acid	4:2FTS	757124-72-4
PERFLUOROALKANE SULFONAMIDES (FASAs)		
Perfluorooctanesulfonamide	FOSA	754-91-6
N-Ethyl Perfluorooctane Sulfonamide	NEtFOSA	4151-50-2
N-Methyl Perfluorooctane Sulfonamide	NMeFOSA	31506-32-8
PERFLUOROALKANE SULFONYL SUBSTANCES		
N-Ethyl Perfluorooctanesulfonamido Ethanol	NEtFOSE	1691-99-2
N-Methyl Perfluorooctanesulfonamido Ethanol	NMeFOSE	24448-09-7
N-Ethyl Perfluorooctanesulfonamidoacetic Acid	NEtFOSAA	2991-50-6
N-Methyl Perfluorooctanesulfonamidoacetic Acid	NMeFOSAA	2355-31-9
PER- and POLYFLUOROALKYL ETHER CARBOXYLIC ACIDS		
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid	HFPO-DA	13252-13-6
4,8-Dioxa-3h-Perfluorononanoic Acid	ADONA	919005-14-4
CHLORO-PERFLUOROALKYL SULFONIC ACIDS		
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid	11Cl-PF3OUdS	763051-92-9
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid	9Cl-PF3ONS	756426-58-1
PERFLUOROETHER SULFONIC ACIDS (PFESAs)		
Perfluoro(2-Ethoxyethane)Sulfonic Acid	PFEEESA	113507-82-7
PERFLUOROETHER/POLYETHER CARBOXYLIC ACIDS (PFPCAs)		
Perfluoro-3-Methoxypropanoic Acid	PFMPA	377-73-1
Perfluoro-4-Methoxybutanoic Acid	PFMBA	863090-89-5
Nonafluoro-3,6-Dioxaheptanoic Acid	NFDHA	151772-58-6

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GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers



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Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers



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Data Qualifiers

- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name: BRH
Project Number: 102064

Lab Number: L2170029
Report Date: 01/18/22

REFERENCES

- 136 Determination of Per- and Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution Anion Exchange Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS). EPA Method 533, EPA Document 815-B-19-020, November 2019.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 625/625.1: alpha-Terpeneol

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpeneol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LCHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522, EPA 537.1.

Non-Potable Water

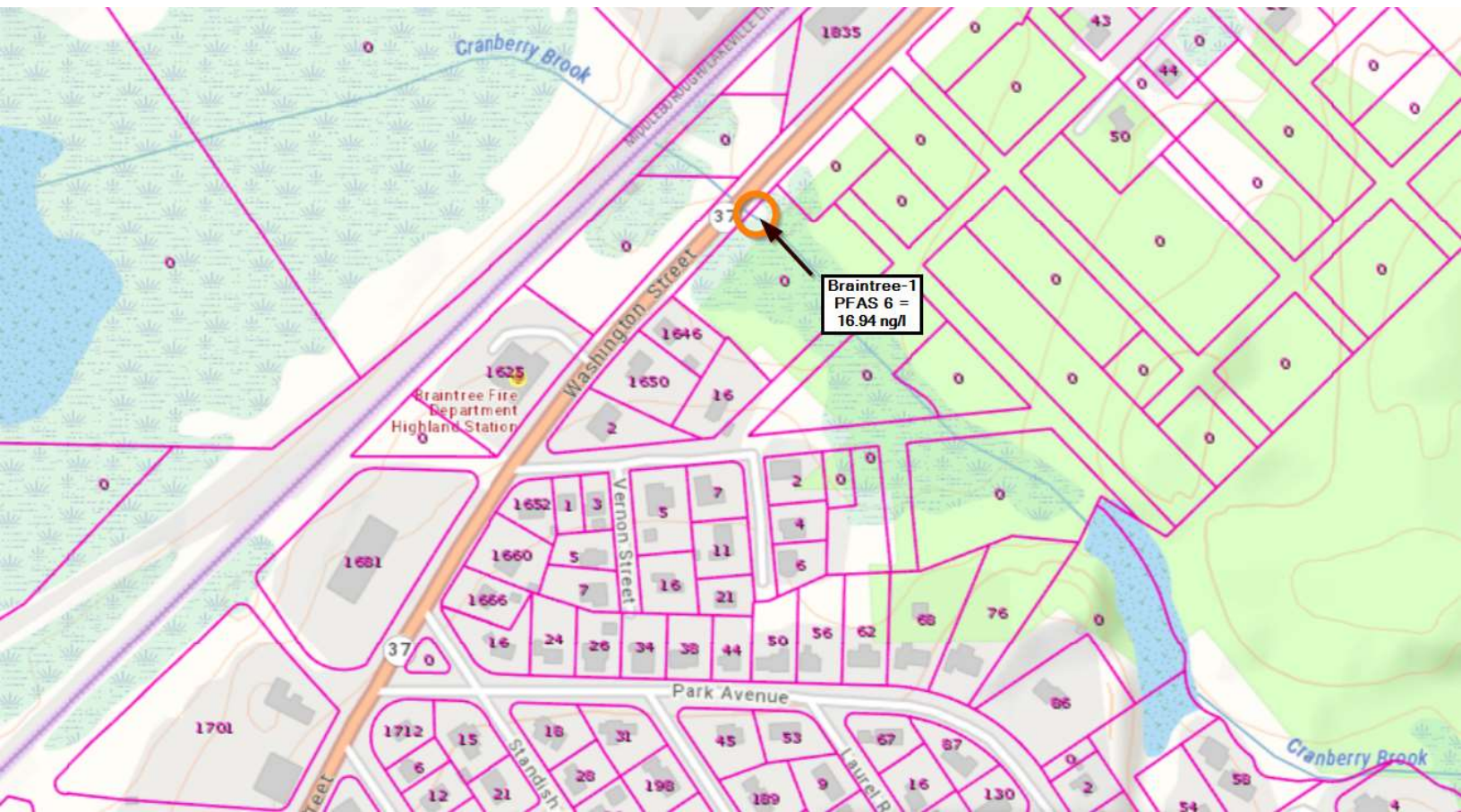
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

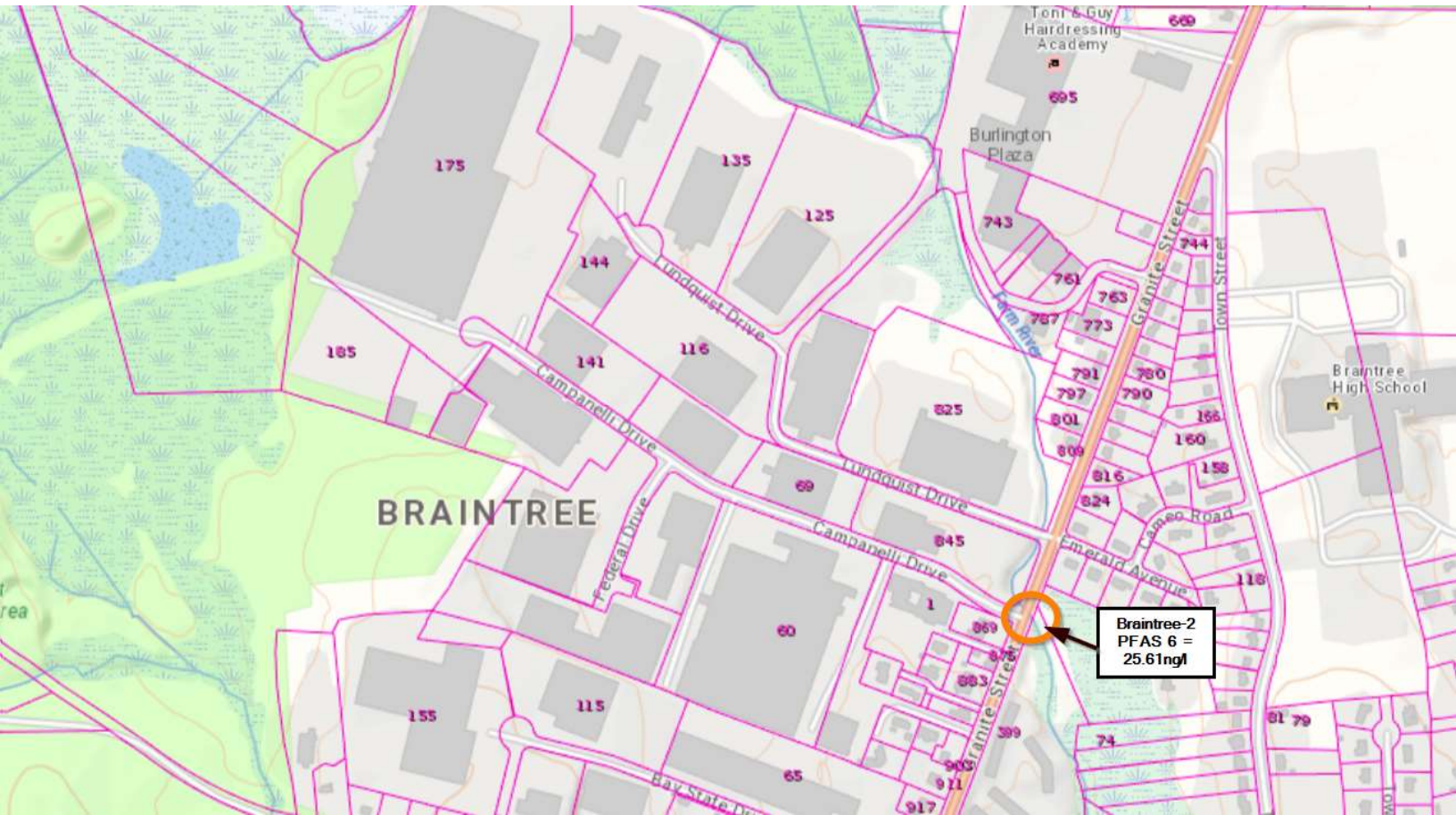
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.







ANALYTICAL REPORT

Lab Number:	L2171392
Client:	Massachusetts DEP 20 Riverside Drive Lakeville, MA 02347-1676
ATTN:	Jennifer Wharff
Phone:	(508) 946-2803
Project Name:	BRH
Project Number:	102064
Report Date:	01/14/22

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Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-17-00150), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
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Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2171392-01	DOT-SW-1	WATER	BLUE HILL RIVER 93	12/29/21 09:53	12/29/21
L2171392-02	FRB	WATER	BLUE HILL RIVER 93	12/29/21 10:20	12/29/21
L2171392-03	DOT-SW-2	WATER	BLUE HILL RIVER 93	12/29/21 10:45	12/29/21
L2171392-04	FRB	WATER	BLUE HILL RIVER 93	12/29/21 10:50	12/29/21
L2171392-05	DOT-SW-3	WATER	BLUE HILL RIVER 93	12/29/21 11:05	12/29/21
L2171392-06	FRB	WATER	BLUE HILL RIVER 93	12/29/21 11:35	12/29/21

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

Case Narrative (continued)

Report Submission

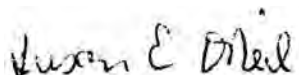
All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Perfluorinated Alkyl Acids by EPA 533

WG1592270-2R: The sample was re-analyzed due to QC failures in the original analysis. The results of the re-analysis are reported.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Susan O'Neil

Title: Technical Director/Representative

Date: 01/14/22

ORGANICS

SEMIVOLATILES

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

SAMPLE RESULTS

Lab ID: L2171392-01
 Client ID: DOT-SW-1
 Sample Location: BLUE HILL RIVER 93

Date Collected: 12/29/21 09:53
 Date Received: 12/29/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 01/13/22 22:30
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 01/10/22 09:18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	2.52		ng/l	1.91	0.637	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.91	0.637	1
Perfluoropentanoic Acid (PFPeA)	1.94		ng/l	1.91	0.637	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.91	0.637	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.91	0.637	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.91	0.637	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.91	0.637	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.91	0.637	1
Perfluorohexanoic Acid (PFHxA)	1.68	J	ng/l	1.91	0.637	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.91	0.637	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.91	0.637	1
Perfluoroheptanoic Acid (PFHpA)	0.724	J	ng/l	1.91	0.637	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.91	0.637	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.91	0.637	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.648	J	ng/l	1.91	0.637	1
Perfluorooctanoic Acid (PFOA)	1.22	J	ng/l	1.91	0.637	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.91	0.637	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.91	0.637	1
Perfluorooctanesulfonic Acid (PFOS)	1.45	J	ng/l	1.91	0.957	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.91	0.637	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.91	0.637	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.91	0.637	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.91	0.637	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.91	0.637	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.91	0.637	1

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

SAMPLE RESULTS

Lab ID: L2171392-01
 Client ID: DOT-SW-1
 Sample Location: BLUE HILL RIVER 93

Date Collected: 12/29/21 09:53
 Date Received: 12/29/21
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	97		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	83		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	82		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	139		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	84		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	87		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	96		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	97		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	103		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	88		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	89		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	88		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	82		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	88		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	90		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	62		50-200

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

SAMPLE RESULTS

Lab ID: L2171392-02
 Client ID: FRB
 Sample Location: BLUE HILL RIVER 93

Date Collected: 12/29/21 10:20
 Date Received: 12/29/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 01/13/22 22:39
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 01/10/22 09:18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.77	0.591	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.77	0.591	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.77	0.591	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.77	0.591	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.77	0.591	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.77	0.591	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.77	0.591	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.77	0.591	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.77	0.591	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.77	0.591	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.77	0.591	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.77	0.591	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.77	0.591	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.77	0.591	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.990	J	ng/l	1.77	0.591	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.77	0.591	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.77	0.591	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.77	0.591	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.77	0.888	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.77	0.591	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.77	0.591	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.77	0.591	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.77	0.591	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.77	0.591	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.77	0.591	1

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

SAMPLE RESULTS

Lab ID: L2171392-02
 Client ID: FRB
 Sample Location: BLUE HILL RIVER 93

Date Collected: 12/29/21 10:20
 Date Received: 12/29/21
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C4]Butanoic Acid (MPFBA)			102		50-200	
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)			96		50-200	
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)			102		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)			84		50-200	
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)			100		50-200	
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)			106		50-200	
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)			102		50-200	
Perfluoro[13C8]Octanoic Acid (M8PFOA)			96		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)			71		50-200	
Perfluoro[13C9]Nonanoic Acid (M9PFNA)			86		50-200	
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)			89		50-200	
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)			110		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)			90		50-200	
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)			102		50-200	
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)			111		50-200	
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)			87		50-200	

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

SAMPLE RESULTS

Lab ID: L2171392-03
 Client ID: DOT-SW-2
 Sample Location: BLUE HILL RIVER 93

Date Collected: 12/29/21 10:45
 Date Received: 12/29/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 01/13/22 22:48
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 01/10/22 09:18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	2.98		ng/l	1.91	0.637	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.91	0.637	1
Perfluoropentanoic Acid (PFPeA)	2.10		ng/l	1.91	0.637	1
Perfluorobutanesulfonic Acid (PFBS)	0.687	J	ng/l	1.91	0.637	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.91	0.637	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.91	0.637	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.91	0.637	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.91	0.637	1
Perfluorohexanoic Acid (PFHxA)	1.83	J	ng/l	1.91	0.637	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.91	0.637	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.91	0.637	1
Perfluoroheptanoic Acid (PFHpA)	0.725	J	ng/l	1.91	0.637	1
Perfluorohexanesulfonic Acid (PFHxS)	0.725	J	ng/l	1.91	0.637	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.91	0.637	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.91	0.637	1
Perfluorooctanoic Acid (PFOA)	1.72	J	ng/l	1.91	0.637	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.91	0.637	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.91	0.637	1
Perfluorooctanesulfonic Acid (PFOS)	1.45	J	ng/l	1.91	0.958	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.91	0.637	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.91	0.637	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.91	0.637	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.91	0.637	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.91	0.637	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.91	0.637	1

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

SAMPLE RESULTS

Lab ID: L2171392-03
 Client ID: DOT-SW-2
 Sample Location: BLUE HILL RIVER 93

Date Collected: 12/29/21 10:45
 Date Received: 12/29/21
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	99		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	86		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	85		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	137		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	102		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	109		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	92		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	109		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	83		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	106		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	85		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	110		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	77		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	109		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	107		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	69		50-200

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

SAMPLE RESULTS

Lab ID: L2171392-04
 Client ID: FRB
 Sample Location: BLUE HILL RIVER 93

Date Collected: 12/29/21 10:50
 Date Received: 12/29/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 01/13/22 22:56
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 01/10/22 09:18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.76	0.588	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.76	0.588	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.76	0.588	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.76	0.588	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.76	0.588	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.76	0.588	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.76	0.588	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.76	0.588	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.76	0.588	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.76	0.588	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.76	0.588	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.76	0.588	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.76	0.588	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.76	0.588	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.76	0.588	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.76	0.588	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.76	0.588	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.76	0.588	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.76	0.884	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.76	0.588	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.76	0.588	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.76	0.588	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.76	0.588	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.76	0.588	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.76	0.588	1

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

SAMPLE RESULTS

Lab ID: L2171392-04
 Client ID: FRB
 Sample Location: BLUE HILL RIVER 93

Date Collected: 12/29/21 10:50
 Date Received: 12/29/21
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C4]Butanoic Acid (MPFBA)			105		50-200	
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)			98		50-200	
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)			95		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)			89		50-200	
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)			95		50-200	
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)			95		50-200	
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)			98		50-200	
Perfluoro[13C8]Octanoic Acid (M8PFOA)			104		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)			91		50-200	
Perfluoro[13C9]Nonanoic Acid (M9PFNA)			98		50-200	
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)			93		50-200	
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)			99		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)			84		50-200	
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)			112		50-200	
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)			114		50-200	
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)			88		50-200	

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

SAMPLE RESULTS

Lab ID: L2171392-05
 Client ID: DOT-SW-3
 Sample Location: BLUE HILL RIVER 93

Date Collected: 12/29/21 11:05
 Date Received: 12/29/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 01/13/22 23:05
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 01/10/22 09:18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	2.98		ng/l	1.88	0.630	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.88	0.630	1
Perfluoropentanoic Acid (PFPeA)	2.00		ng/l	1.88	0.630	1
Perfluorobutanesulfonic Acid (PFBS)	0.679	J	ng/l	1.88	0.630	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.88	0.630	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.88	0.630	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.88	0.630	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.88	0.630	1
Perfluorohexanoic Acid (PFHxA)	1.92		ng/l	1.88	0.630	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.88	0.630	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.88	0.630	1
Perfluoroheptanoic Acid (PFHpA)	0.980	J	ng/l	1.88	0.630	1
Perfluorohexanesulfonic Acid (PFHxS)	0.792	J	ng/l	1.88	0.630	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.88	0.630	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.88	0.630	1
Perfluorooctanoic Acid (PFOA)	2.07		ng/l	1.88	0.630	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.88	0.630	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.88	0.630	1
Perfluorooctanesulfonic Acid (PFOS)	2.45		ng/l	1.88	0.946	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.88	0.630	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.88	0.630	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.88	0.630	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.88	0.630	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.88	0.630	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.88	0.630	1

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

SAMPLE RESULTS

Lab ID: L2171392-05
 Client ID: DOT-SW-3
 Sample Location: BLUE HILL RIVER 93

Date Collected: 12/29/21 11:05
 Date Received: 12/29/21
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C4]Butanoic Acid (MPFBA)			99		50-200	
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)			89		50-200	
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)			84		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)			141		50-200	
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)			82		50-200	
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)			86		50-200	
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)			92		50-200	
Perfluoro[13C8]Octanoic Acid (M8PFOA)			90		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)			103		50-200	
Perfluoro[13C9]Nonanoic Acid (M9PFNA)			87		50-200	
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)			84		50-200	
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)			81		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)			76		50-200	
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)			88		50-200	
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)			82		50-200	
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)			61		50-200	

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

SAMPLE RESULTS

Lab ID: L2171392-06
 Client ID: FRB
 Sample Location: BLUE HILL RIVER 93

Date Collected: 12/29/21 11:35
 Date Received: 12/29/21
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 01/13/22 23:14
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 01/10/22 09:18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.78	0.595	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.78	0.595	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.78	0.595	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.78	0.595	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.78	0.595	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.78	0.595	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.78	0.595	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.78	0.595	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.78	0.595	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.78	0.595	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.78	0.595	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.78	0.595	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.78	0.595	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.78	0.595	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.78	0.595	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.78	0.595	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.78	0.595	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.78	0.595	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.78	0.895	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.78	0.595	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.78	0.595	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.78	0.595	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.78	0.595	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.78	0.595	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.78	0.595	1

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

SAMPLE RESULTS

Lab ID: L2171392-06
 Client ID: FRB
 Sample Location: BLUE HILL RIVER 93

Date Collected: 12/29/21 11:35
 Date Received: 12/29/21
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C4]Butanoic Acid (MPFBA)			106		50-200	
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)			99		50-200	
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)			107		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)			106		50-200	
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)			75		50-200	
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)			80		50-200	
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)			112		50-200	
Perfluoro[13C8]Octanoic Acid (M8PFOA)			73		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)			92		50-200	
Perfluoro[13C9]Nonanoic Acid (M9PFNA)			81		50-200	
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)			116		50-200	
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)			83		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)			91		50-200	
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)			86		50-200	
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)			89		50-200	
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)			63		50-200	

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 136,533
Analytical Date: 01/13/22 19:35
Analyst: MP

Extraction Method: EPA 533
Extraction Date: 01/10/22 09:15

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab for sample(s): 01-06 Batch: WG1592270-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	0.668
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	2.00	0.668
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	0.668
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	0.668
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	2.00	0.668
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEEESA)	ND		ng/l	2.00	0.668
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	2.00	0.668
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	0.668
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	2.00	0.668
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	2.00	0.668
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	0.668
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	0.668
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.00	0.668
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	0.668
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	0.668
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	0.668
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	1.00
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	0.668
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	0.668
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	0.668
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	2.00	0.668
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	0.668

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 136,533
Analytical Date: 01/13/22 19:35
Analyst: MP

Extraction Method: EPA 533
Extraction Date: 01/10/22 09:15

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab for sample(s): 01-06 Batch: WG1592270-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	105		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	97		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	100		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	93		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	102		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	121		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	121		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	102		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	83		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	108		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	97		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	102		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	90		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	107		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	117		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	83		50-200

Lab Control Sample Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

Parameter	LCS	Qual	LCS	Qual	%Recovery	RPD	Qual	RPD
	%Recovery		%Recovery		Limits			Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-06 Batch: WG1592270-2								
Perfluorobutanoic Acid (PFBA)	96		-		70-130	-		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	94		-		70-130	-		30
Perfluoropentanoic Acid (PFPeA)	106		-		70-130	-		30
Perfluorobutanesulfonic Acid (PFBS)	86		-		70-130	-		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	92		-		70-130	-		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEEESA)	98		-		70-130	-		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	97		-		70-130	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	100		-		70-130	-		30
Perfluorohexanoic Acid (PFHxA)	96		-		70-130	-		30
Perfluoropentanesulfonic Acid (PFPeS)	96		-		70-130	-		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	84		-		70-130	-		30
Perfluoroheptanoic Acid (PFHpA)	75		-		70-130	-		30
Perfluorohexanesulfonic Acid (PFHxS)	99		-		70-130	-		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	97		-		70-130	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	116		-		70-130	-		30
Perfluorooctanoic Acid (PFOA)	103		-		70-130	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	108		-		70-130	-		30
Perfluorononanoic Acid (PFNA)	79		-		70-130	-		30
Perfluorooctanesulfonic Acid (PFOS)	98		-		70-130	-		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	106		-		70-130	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	105		-		70-130	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

Parameter	LCS		LCSD		%Recovery Limits	RPD	RPD	
	%Recovery	Qual	%Recovery	Qual			Qual	Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-06 Batch: WG1592270-2								
Perfluorodecanoic Acid (PFDA)	106		-		70-130	-		30
Perfluoroundecanoic Acid (PFUnA)	106		-		70-130	-		30
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	114		-		70-130	-		30
Perfluorododecanoic Acid (PFDoA)	99		-		70-130	-		30

Surrogate (Extracted Internal Standard)	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
Perfluoro[13C4]Butanoic Acid (MPFBA)	100				50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	91				50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	103				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	115				50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	90				50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	116				50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	89				50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	104				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	105				50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	116				50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	98				50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	96				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	105				50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	104				50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	114				50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	92				50-200

Matrix Spike Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab		Associated sample(s): 01-06			QC Batch ID: WG1592270-3		QC Sample: L2169177-01		Client ID: MS Sample			
Perfluorobutanoic Acid (PFBA)	1.80	151	146	96	-	-	-	-	70-130	-	-	30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND	151	133	88	-	-	-	-	70-130	-	-	30
Perfluoropentanoic Acid (PFPeA)	0.901J	151	148	98	-	-	-	-	70-130	-	-	30
Perfluorobutanesulfonic Acid (PFBS)	10.4	134	150	104	-	-	-	-	70-130	-	-	30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND	151	144	96	-	-	-	-	70-130	-	-	30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND	134	144	107	-	-	-	-	70-130	-	-	30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND	151	139	92	-	-	-	-	70-130	-	-	30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	141	154	109	-	-	-	-	70-130	-	-	30
Perfluorohexanoic Acid (PFHxA)	0.970J	151	136	90	-	-	-	-	70-130	-	-	30
Perfluoropentanesulfonic Acid (PFPeS)	ND	142	123	87	-	-	-	-	70-130	-	-	30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND	151	156	103	-	-	-	-	70-130	-	-	30
Perfluoroheptanoic Acid (PFHpA)	0.728J	151	139	92	-	-	-	-	70-130	-	-	30
Perfluorohexanesulfonic Acid (PFHxS)	1.35J	137	119	87	-	-	-	-	70-130	-	-	30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	142	124	87	-	-	-	-	70-130	-	-	30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	2.29	144	162	111	-	-	-	-	70-130	-	-	30
Perfluorooctanoic Acid (PFOA)	4.02	151	158	102	-	-	-	-	70-130	-	-	30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	144	165	115	-	-	-	-	70-130	-	-	30
Perfluorononanoic Acid (PFNA)	ND	151	152	101	-	-	-	-	70-130	-	-	30
Perfluorooctanesulfonic Acid (PFOS)	6.06	140	153	105	-	-	-	-	70-130	-	-	30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND	141	160	114	-	-	-	-	70-130	-	-	30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	145	143	99	-	-	-	-	70-130	-	-	30
Perfluorodecanoic Acid (PFDA)	ND	151	159	105	-	-	-	-	70-130	-	-	30

Matrix Spike Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab		Associated sample(s): 01-06			QC Batch ID: WG1592270-3		QC Sample: L2169177-01		Client ID: MS Sample			
Perfluoroundecanoic Acid (PFUnA)	ND	151	163	108		-	-		70-130	-		30
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND	142	160	112		-	-		70-130	-		30
Perfluorododecanoic Acid (PFDoA)	ND	151	162	107		-	-		70-130	-		30

<i>Surrogate (Extracted Internal Standard)</i>	<i>MS % Recovery</i>	<i>MS Qualifier</i>	<i>MSD % Recovery</i>	<i>MSD Qualifier</i>	<i>Acceptance Criteria</i>
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	110				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	149				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	108				50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	76				50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	93				50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	86				50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	93				50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	95				50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	114				50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	96				50-200
Perfluoro[13C4]Butanoic Acid (MPFBA)	98				50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	92				50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	93				50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	100				50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	86				50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	99				50-200

Lab Duplicate Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-06 QC Batch ID: WG1592270-4 QC Sample: L2169177-04 Client ID: DUP Sample						
Perfluorobutanoic Acid (PFBA)	7.00	6.58	ng/l	6		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND	ND	ng/l	NC		30
Perfluoropentanoic Acid (PFPeA)	6.82	6.82	ng/l	0		30
Perfluorobutanesulfonic Acid (PFBS)	4.03	4.41	ng/l	9		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND	ND	ng/l	NC		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND	ND	ng/l	NC		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	ND	ng/l	NC		30
Perfluorohexanoic Acid (PFHxA)	6.24	8.43	ng/l	30		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	ND	ng/l	NC		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND	ND	ng/l	NC		30
Perfluoroheptanoic Acid (PFHpA)	3.27	2.84	ng/l	14		30
Perfluorohexanesulfonic Acid (PFHxS)	2.54	2.72	ng/l	7		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	ND	ng/l	NC		30
Perfluorooctanoic Acid (PFOA)	7.58	7.56	ng/l	0		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	ND	ng/l	NC		30
Perfluorononanoic Acid (PFNA)	ND	ND	ng/l	NC		30
Perfluorooctanesulfonic Acid (PFOS)	4.75	4.77	ng/l	0		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND	ND	ng/l	NC		30

Lab Duplicate Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-06 QC Batch ID: WG1592270-4 QC Sample: L2169177-04 Client ID: DUP Sample						
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	ND	ng/l	NC		30
Perfluorodecanoic Acid (PFDA)	ND	ND	ng/l	NC		30
Perfluoroundecanoic Acid (PFUnA)	ND	ND	ng/l	NC		30
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND	ND	ng/l	NC		30
Perfluorododecanoic Acid (PFDoA)	ND	ND	ng/l	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	98		98		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	89		89		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	92		76		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	159		126		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	96		78		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	91		87		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	90		80		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	97		96		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	118		100		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	100		93		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	93		79		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	104		85		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	97		84		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	92		89		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	97		84		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	70		63		50-200

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
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Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information

Cooler **Custody Seal**
A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2171392-01A	Plastic 250ml Ammonium Acetate preserved	A	NA		2.4	Y	Absent		A2-533(28)
L2171392-01B	Plastic 250ml Ammonium Acetate preserved	A	NA		2.4	Y	Absent		A2-533(28)
L2171392-02A	Plastic 250ml Ammonium Acetate preserved	A	NA		2.4	Y	Absent		A2-533(28)
L2171392-03A	Plastic 250ml Ammonium Acetate preserved	A	NA		2.4	Y	Absent		A2-533(28)
L2171392-03B	Plastic 250ml Ammonium Acetate preserved	A	NA		2.4	Y	Absent		A2-533(28)
L2171392-04A	Plastic 250ml Ammonium Acetate preserved	A	NA		2.4	Y	Absent		A2-533(28)
L2171392-05A	Plastic 250ml Ammonium Acetate preserved	A	NA		2.4	Y	Absent		A2-533(28)
L2171392-05B	Plastic 250ml Ammonium Acetate preserved	A	NA		2.4	Y	Absent		A2-533(28)
L2171392-06A	Plastic 250ml Ammonium Acetate preserved	A	NA		2.4	Y	Absent		A2-533(28)

Project Name: BRH
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PFAS PARAMETER SUMMARY

Parameter	Acronym	CAS Number
PERFLUOROALKYL CARBOXYLIC ACIDS (PFCAs)		
Perfluorooctadecanoic Acid	PFODA	16517-11-6
Perfluorohexadecanoic Acid	PFHxDA	67905-19-5
Perfluorotetradecanoic Acid	PFTA	376-06-7
Perfluorotridecanoic Acid	PFTrDA	72629-94-8
Perfluorododecanoic Acid	PFDoA	307-55-1
Perfluoroundecanoic Acid	PFUnA	2058-94-8
Perfluorodecanoic Acid	PFDA	335-76-2
Perfluorononanoic Acid	PFNA	375-95-1
Perfluorooctanoic Acid	PFOA	335-67-1
Perfluoroheptanoic Acid	PFHpA	375-85-9
Perfluorohexanoic Acid	PFHxA	307-24-4
Perfluoropentanoic Acid	PFPeA	2706-90-3
Perfluorobutanoic Acid	PFBA	375-22-4
PERFLUOROALKYL SULFONIC ACIDS (PFSAs)		
Perfluorododecanesulfonic Acid	PFDoDS	79780-39-5
Perfluorodecanesulfonic Acid	PFDS	335-77-3
Perfluorononanesulfonic Acid	PFNS	68259-12-1
Perfluorooctanesulfonic Acid	PFOS	1763-23-1
Perfluoroheptanesulfonic Acid	PFHpS	375-92-8
Perfluorohexanesulfonic Acid	PFHxS	355-46-4
Perfluoropentanesulfonic Acid	PFPeS	2706-91-4
Perfluorobutanesulfonic Acid	PFBS	375-73-5
FLUOROTELOMERS		
1H,1H,2H,2H-Perfluorododecanesulfonic Acid	10:2FTS	120226-60-0
1H,1H,2H,2H-Perfluorodecanesulfonic Acid	8:2FTS	39108-34-4
1H,1H,2H,2H-Perfluorooctanesulfonic Acid	6:2FTS	27619-97-2
1H,1H,2H,2H-Perfluorohexanesulfonic Acid	4:2FTS	757124-72-4
PERFLUOROALKANE SULFONAMIDES (FASAs)		
Perfluorooctanesulfonamide	FOSA	754-91-6
N-Ethyl Perfluorooctane Sulfonamide	NEtFOSA	4151-50-2
N-Methyl Perfluorooctane Sulfonamide	NMeFOSA	31506-32-8
PERFLUOROALKANE SULFONYL SUBSTANCES		
N-Ethyl Perfluorooctanesulfonamido Ethanol	NEtFOSE	1691-99-2
N-Methyl Perfluorooctanesulfonamido Ethanol	NMeFOSE	24448-09-7
N-Ethyl Perfluorooctanesulfonamidoacetic Acid	NEtFOSAA	2991-50-6
N-Methyl Perfluorooctanesulfonamidoacetic Acid	NMeFOSAA	2355-31-9
PER- and POLYFLUOROALKYL ETHER CARBOXYLIC ACIDS		
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid	HFPO-DA	13252-13-6
4,8-Dioxa-3h-Perfluorononanoic Acid	ADONA	919005-14-4
CHLORO-PERFLUOROALKYL SULFONIC ACIDS		
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid	11Cl-PF3OUdS	763051-92-9
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid	9Cl-PF3ONS	756426-58-1
PERFLUOROETHER SULFONIC ACIDS (PFESAs)		
Perfluoro(2-Ethoxyethane)Sulfonic Acid	PFEEESA	113507-82-7
PERFLUOROETHER/POLYETHER CARBOXYLIC ACIDS (PFPCAs)		
Perfluoro-3-Methoxypropanoic Acid	PFMPA	377-73-1
Perfluoro-4-Methoxybutanoic Acid	PFMBA	863090-89-5
Nonafluoro-3,6-Dioxaheptanoic Acid	NFDHA	151772-58-6

Project Name: BRH
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GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers



Project Name: BRH
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Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers



Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

Data Qualifiers

- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name: BRH
Project Number: 102064

Lab Number: L2171392
Report Date: 01/14/22

REFERENCES

- 136 Determination of Per- and Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution Anion Exchange Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS). EPA Method 533, EPA Document 815-B-19-020, November 2019.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 625/625.1: alpha-Terpeneol

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpeneol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LCHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

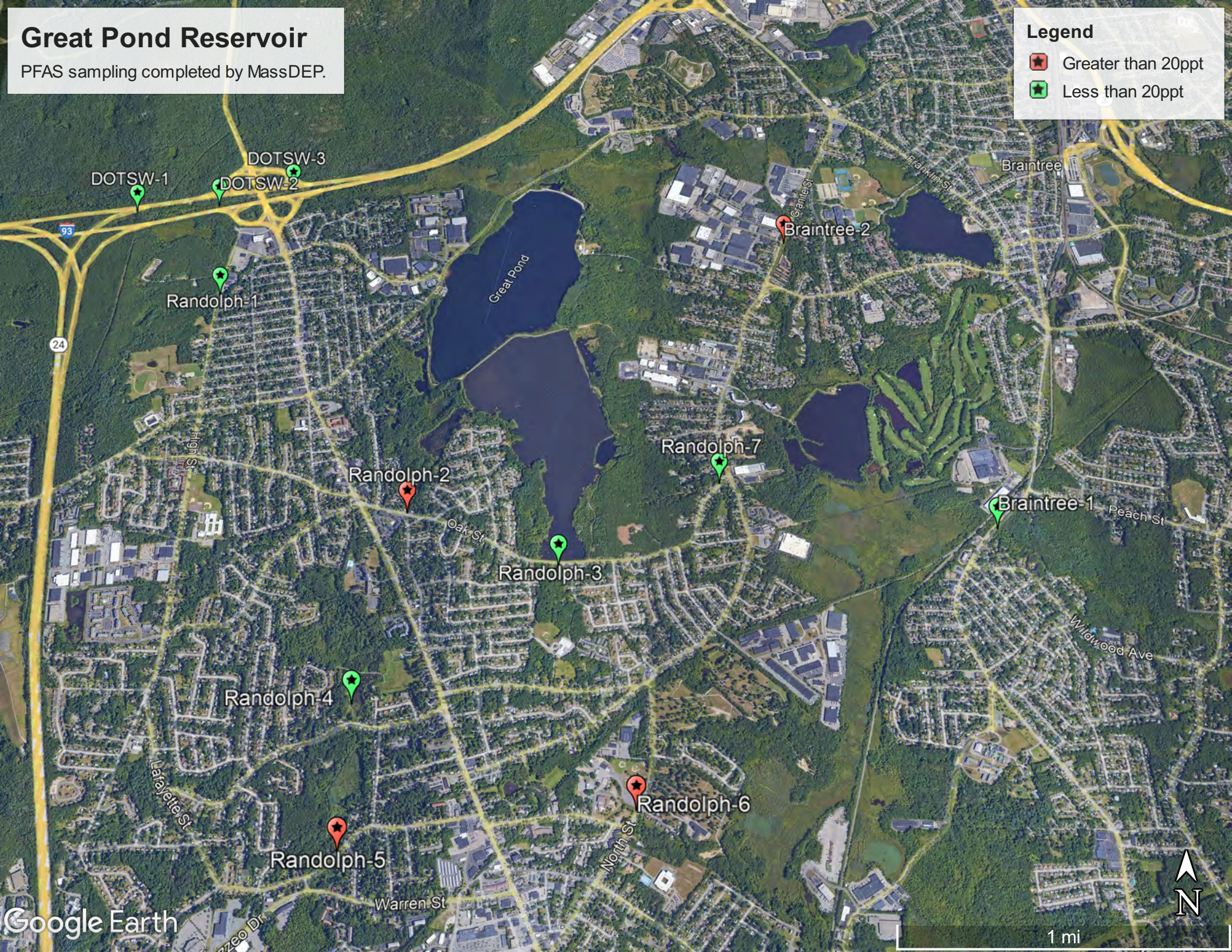


Great Pond Reservoir

PFAS sampling completed by MassDEP.

Legend

- Greater than 20ppt
- Less than 20ppt





ANALYTICAL REPORT

Lab Number:	L2206854
Client:	Massachusetts DEP 20 Riverside Drive Lakeville, MA 02347-1676
ATTN:	Jennifer Wharff
Phone:	(508) 946-2803
Project Name:	BRH
Project Number:	102064
Report Date:	02/25/22

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-17-00150), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com



Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2206854-01	RANDOLPH-1	WATER	RANDOLPH	02/09/22 10:15	02/09/22
L2206854-02	FIELD BLANK-1	WATER	RANDOLPH	02/09/22 10:22	02/09/22
L2206854-03	RANDOLPH-2	WATER	RANDOLPH	02/09/22 10:50	02/09/22
L2206854-04	FIELD BLANK-2	WATER	RANDOLPH	02/09/22 10:59	02/09/22
L2206854-05	RANDOLPH-3	WATER	RANDOLPH	02/09/22 11:21	02/09/22
L2206854-06	FIELD BLANK-3	WATER	RANDOLPH	02/09/22 11:30	02/09/22
L2206854-07	RANDOLPH-4	WATER	RANDOLPH	02/09/22 12:05	02/09/22
L2206854-08	FIELD BLANK-4	WATER	RANDOLPH	02/09/22 12:10	02/09/22
L2206854-09	RANDOLPH-5	WATER	RANDOLPH	02/09/22 12:35	02/09/22
L2206854-10	FIELD BLANK-5	WATER	RANDOLPH	02/09/22 12:44	02/09/22
L2206854-11	RANDOLPH-6	WATER	RANDOLPH	02/09/22 14:05	02/09/22
L2206854-12	FIELD BLANK-6	WATER	RANDOLPH	02/09/22 14:12	02/09/22
L2206854-13	RANDOLPH-7	WATER	RANDOLPH	02/09/22 14:40	02/09/22
L2206854-14	FIELD BLANK-7	WATER	RANDOLPH	02/09/22 14:50	02/09/22

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

Case Narrative (continued)

Report Submission

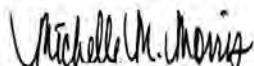
All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Perfluorinated Alkyl Acids by EPA 533

L2206854-05 and -07: The sample was centrifuged and decanted prior to extraction due to sample matrix. The WG1605960-1 Method Blank, associated with L2206854-01 through -14, has concentrations below the reporting limits and "J" qualified; however, the values are above 1/3 the reporting limits. Since the samples were non-detect to the RL for these target analytes, no further actions were taken. The results of the original analysis are reported.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Michelle M. Morris

Title: Technical Director/Representative

Date: 02/25/22

ORGANICS

SEMIVOLATILES

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-01
Client ID: RANDOLPH-1
Sample Location: RANDOLPH

Date Collected: 02/09/22 10:15
Date Received: 02/09/22
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 136,533
Analytical Date: 02/19/22 14:54
Analyst: MP

Extraction Method: EPA 533
Extraction Date: 02/17/22 08:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	3.72		ng/l	1.92	0.640	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.92	0.640	1
Perfluoropentanoic Acid (PFPeA)	3.94		ng/l	1.92	0.640	1
Perfluorobutanesulfonic Acid (PFBS)	0.996	J	ng/l	1.92	0.640	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.92	0.640	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.92	0.640	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.92	0.640	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.92	0.640	1
Perfluorohexanoic Acid (PFHxA)	3.29		ng/l	1.92	0.640	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.92	0.640	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.92	0.640	1
Perfluoroheptanoic Acid (PFHpA)	2.03		ng/l	1.92	0.640	1
Perfluorohexanesulfonic Acid (PFHxS)	1.38	J	ng/l	1.92	0.640	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.92	0.640	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.651	J	ng/l	1.92	0.640	1
Perfluorooctanoic Acid (PFOA)	4.02		ng/l	1.92	0.640	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.92	0.640	1
Perfluorononanoic Acid (PFNA)	0.766	J	ng/l	1.92	0.640	1
Perfluorooctanesulfonic Acid (PFOS)	4.10		ng/l	1.92	0.962	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.92	0.640	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.92	0.640	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.92	0.640	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.92	0.640	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.92	0.640	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.92	0.640	1

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-01
 Client ID: RANDOLPH-1
 Sample Location: RANDOLPH

Date Collected: 02/09/22 10:15
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	95		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	78		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	88		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	125		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	84		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	84		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	96		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	89		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	122		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	89		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	97		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	80		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	91		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	83		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	81		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	82		50-200

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-02
 Client ID: FIELD BLANK-1
 Sample Location: RANDOLPH

Date Collected: 02/09/22 10:22
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 02/19/22 15:12
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 02/17/22 08:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.80	0.601	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.80	0.601	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.80	0.601	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.80	0.601	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.80	0.601	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.80	0.601	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.80	0.601	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.80	0.601	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.80	0.601	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.80	0.601	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.80	0.601	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.80	0.601	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.80	0.601	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.80	0.601	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.648	J	ng/l	1.80	0.601	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.80	0.601	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.80	0.601	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.80	0.601	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.80	0.904	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.80	0.601	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.80	0.601	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.80	0.601	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.80	0.601	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.80	0.601	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.80	0.601	1

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-02
 Client ID: FIELD BLANK-1
 Sample Location: RANDOLPH

Date Collected: 02/09/22 10:22
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	101		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	97		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	112		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	95		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	101		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	95		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	115		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	96		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	100		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	103		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	108		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	96		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	95		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	104		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	101		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	101		50-200

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-03
 Client ID: RANDOLPH-2
 Sample Location: RANDOLPH

Date Collected: 02/09/22 10:50
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 02/19/22 15:20
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 02/17/22 08:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	5.28		ng/l	1.91	0.639	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.91	0.639	1
Perfluoropentanoic Acid (PFPeA)	5.32		ng/l	1.91	0.639	1
Perfluorobutanesulfonic Acid (PFBS)	2.64		ng/l	1.91	0.639	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.91	0.639	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.91	0.639	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.91	0.639	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.91	0.639	1
Perfluorohexanoic Acid (PFHxA)	4.48		ng/l	1.91	0.639	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.91	0.639	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.91	0.639	1
Perfluoroheptanoic Acid (PFHpA)	2.68		ng/l	1.91	0.639	1
Perfluorohexanesulfonic Acid (PFHxS)	1.95		ng/l	1.91	0.639	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.91	0.639	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.803	J	ng/l	1.91	0.639	1
Perfluorooctanoic Acid (PFOA)	5.62		ng/l	1.91	0.639	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.91	0.639	1
Perfluorononanoic Acid (PFNA)	1.26	J	ng/l	1.91	0.639	1
Perfluorooctanesulfonic Acid (PFOS)	10.9		ng/l	1.91	0.960	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.91	0.639	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.91	0.639	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.91	0.639	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.91	0.639	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.91	0.639	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.91	0.639	1

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-03
 Client ID: RANDOLPH-2
 Sample Location: RANDOLPH

Date Collected: 02/09/22 10:50
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	101		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	72		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	89		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	142		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	81		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	83		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	93		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	96		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	172		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	103		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	102		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	95		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	130		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	108		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	103		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	81		50-200

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-04
 Client ID: FIELD BLANK-2
 Sample Location: RANDOLPH

Date Collected: 02/09/22 10:59
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 02/19/22 15:38
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 02/17/22 08:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.97	0.659	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.97	0.659	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.97	0.659	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.97	0.659	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.97	0.659	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.97	0.659	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.97	0.659	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.97	0.659	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.97	0.659	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.97	0.659	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.97	0.659	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.97	0.659	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.97	0.659	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.97	0.659	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.671	J	ng/l	1.97	0.659	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.97	0.659	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.97	0.659	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.97	0.659	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.97	0.991	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.97	0.659	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.97	0.659	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.97	0.659	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.97	0.659	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.97	0.659	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.97	0.659	1

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-04
 Client ID: FIELD BLANK-2
 Sample Location: RANDOLPH

Date Collected: 02/09/22 10:59
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C4]Butanoic Acid (MPFBA)			106		50-200	
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)			100		50-200	
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)			113		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)			101		50-200	
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)			109		50-200	
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)			101		50-200	
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)			116		50-200	
Perfluoro[13C8]Octanoic Acid (M8PFOA)			105		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)			108		50-200	
Perfluoro[13C9]Nonanoic Acid (M9PFNA)			108		50-200	
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)			110		50-200	
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)			101		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)			97		50-200	
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)			106		50-200	
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)			100		50-200	
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)			105		50-200	

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-05
 Client ID: RANDOLPH-3
 Sample Location: RANDOLPH

Date Collected: 02/09/22 11:21
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 02/19/22 15:46
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 02/17/22 08:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	6.20		ng/l	1.96	0.655	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.96	0.655	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.96	0.655	1
Perfluorobutanesulfonic Acid (PFBS)	1.37	J	ng/l	1.96	0.655	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.96	0.655	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.96	0.655	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.96	0.655	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.96	0.655	1
Perfluorohexanoic Acid (PFHxA)	2.00		ng/l	1.96	0.655	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.96	0.655	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.96	0.655	1
Perfluoroheptanoic Acid (PFHpA)	1.65	J	ng/l	1.96	0.655	1
Perfluorohexanesulfonic Acid (PFHxS)	2.20		ng/l	1.96	0.655	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.96	0.655	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.824	J	ng/l	1.96	0.655	1
Perfluorooctanoic Acid (PFOA)	2.86		ng/l	1.96	0.655	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.96	0.655	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.96	0.655	1
Perfluorooctanesulfonic Acid (PFOS)	3.34		ng/l	1.96	0.985	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.96	0.655	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.96	0.655	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.96	0.655	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.96	0.655	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.96	0.655	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.96	0.655	1

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-05
 Client ID: RANDOLPH-3
 Sample Location: RANDOLPH

Date Collected: 02/09/22 11:21
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	103		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	72		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	99		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	155		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	94		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	91		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	95		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	101		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	177		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	117		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	107		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	113		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	182		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	134		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	133		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	91		50-200

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-06
 Client ID: FIELD BLANK-3
 Sample Location: RANDOLPH

Date Collected: 02/09/22 11:30
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 02/19/22 15:55
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 02/17/22 08:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.98	0.660	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.98	0.660	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.98	0.660	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.98	0.660	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.98	0.660	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.98	0.660	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.98	0.660	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.98	0.660	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.98	0.660	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.98	0.660	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.98	0.660	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.98	0.660	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.98	0.660	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.98	0.660	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.672	J	ng/l	1.98	0.660	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.98	0.660	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.98	0.660	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.98	0.660	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.98	0.992	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.98	0.660	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.98	0.660	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.98	0.660	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.98	0.660	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.98	0.660	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.98	0.660	1

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-06
 Client ID: FIELD BLANK-3
 Sample Location: RANDOLPH

Date Collected: 02/09/22 11:30
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	108		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	103		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	117		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	105		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	107		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	101		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	122		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	105		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	113		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	107		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	108		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	98		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	98		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	100		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	99		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	107		50-200

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-07
 Client ID: RANDOLPH-4
 Sample Location: RANDOLPH

Date Collected: 02/09/22 12:05
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 02/19/22 16:04
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 02/17/22 08:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	3.30		ng/l	1.94	0.648	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.94	0.648	1
Perfluoropentanoic Acid (PFPeA)	2.13		ng/l	1.94	0.648	1
Perfluorobutanesulfonic Acid (PFBS)	1.71	J	ng/l	1.94	0.648	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.94	0.648	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.94	0.648	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.94	0.648	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.94	0.648	1
Perfluorohexanoic Acid (PFHxA)	2.13		ng/l	1.94	0.648	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.94	0.648	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.94	0.648	1
Perfluoroheptanoic Acid (PFHpA)	1.78	J	ng/l	1.94	0.648	1
Perfluorohexanesulfonic Acid (PFHxS)	0.698	J	ng/l	1.94	0.648	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.94	0.648	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.853	J	ng/l	1.94	0.648	1
Perfluorooctanoic Acid (PFOA)	4.23		ng/l	1.94	0.648	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.94	0.648	1
Perfluorononanoic Acid (PFNA)	0.659	J	ng/l	1.94	0.648	1
Perfluorooctanesulfonic Acid (PFOS)	6.36		ng/l	1.94	0.973	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.94	0.648	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.94	0.648	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.94	0.648	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.94	0.648	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.94	0.648	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.94	0.648	1

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-07
 Client ID: RANDOLPH-4
 Sample Location: RANDOLPH

Date Collected: 02/09/22 12:05
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C4]Butanoic Acid (MPFBA)			102		50-200	
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)			73		50-200	
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)			90		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)			151		50-200	
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)			87		50-200	
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)			88		50-200	
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)			95		50-200	
Perfluoro[13C8]Octanoic Acid (M8PFOA)			98		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)			176		50-200	
Perfluoro[13C9]Nonanoic Acid (M9PFNA)			108		50-200	
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)			103		50-200	
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)			100		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)			138		50-200	
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)			110		50-200	
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)			103		50-200	
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)			87		50-200	

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-08
 Client ID: FIELD BLANK-4
 Sample Location: RANDOLPH

Date Collected: 02/09/22 12:10
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 02/19/22 16:13
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 02/17/22 08:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.35	0.784	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	2.35	0.784	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.35	0.784	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.35	0.784	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	2.35	0.784	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	2.35	0.784	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	2.35	0.784	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	2.35	0.784	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.35	0.784	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	2.35	0.784	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	2.35	0.784	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.35	0.784	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.35	0.784	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	2.35	0.784	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.939	J	ng/l	2.35	0.784	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.35	0.784	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.35	0.784	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.35	0.784	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.35	1.18	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	2.35	0.784	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.35	0.784	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.35	0.784	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.35	0.784	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	2.35	0.784	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.35	0.784	1

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-08
 Client ID: FIELD BLANK-4
 Sample Location: RANDOLPH

Date Collected: 02/09/22 12:10
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C4]Butanoic Acid (MPFBA)			88		50-200	
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)			87		50-200	
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)			111		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)			101		50-200	
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)			98		50-200	
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)			94		50-200	
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)			117		50-200	
Perfluoro[13C8]Octanoic Acid (M8PFOA)			99		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)			106		50-200	
Perfluoro[13C9]Nonanoic Acid (M9PFNA)			102		50-200	
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)			106		50-200	
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)			94		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)			95		50-200	
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)			100		50-200	
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)			96		50-200	
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)			93		50-200	

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-09
 Client ID: RANDOLPH-5
 Sample Location: RANDOLPH

Date Collected: 02/09/22 12:35
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 02/19/22 16:21
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 02/17/22 08:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	5.86		ng/l	1.89	0.632	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.89	0.632	1
Perfluoropentanoic Acid (PFPeA)	5.41		ng/l	1.89	0.632	1
Perfluorobutanesulfonic Acid (PFBS)	2.61		ng/l	1.89	0.632	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.89	0.632	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.89	0.632	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.89	0.632	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.89	0.632	1
Perfluorohexanoic Acid (PFHxA)	4.62		ng/l	1.89	0.632	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.89	0.632	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.89	0.632	1
Perfluoroheptanoic Acid (PFHpA)	2.95		ng/l	1.89	0.632	1
Perfluorohexanesulfonic Acid (PFHxS)	2.27		ng/l	1.89	0.632	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.89	0.632	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.719	J	ng/l	1.89	0.632	1
Perfluorooctanoic Acid (PFOA)	6.09		ng/l	1.89	0.632	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.89	0.632	1
Perfluorononanoic Acid (PFNA)	1.59	J	ng/l	1.89	0.632	1
Perfluorooctanesulfonic Acid (PFOS)	13.6		ng/l	1.89	0.950	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.89	0.632	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.89	0.632	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.89	0.632	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.89	0.632	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.89	0.632	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.89	0.632	1

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-09
 Client ID: RANDOLPH-5
 Sample Location: RANDOLPH

Date Collected: 02/09/22 12:35
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	102		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	72		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	88		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	147		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	87		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	86		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	93		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	99		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	173		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	111		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	99		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	102		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	134		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	110		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	101		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	87		50-200

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-10
 Client ID: FIELD BLANK-5
 Sample Location: RANDOLPH

Date Collected: 02/09/22 12:44
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 02/19/22 16:30
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 02/17/22 08:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	0.666	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	2.00	0.666	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	0.666	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	0.666	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	2.00	0.666	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	2.00	0.666	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	2.00	0.666	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	2.00	0.666	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	0.666	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	2.00	0.666	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	2.00	0.666	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	0.666	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	0.666	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	2.00	0.666	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.798	J	ng/l	2.00	0.666	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	0.666	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	0.666	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	0.666	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	1.00	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	2.00	0.666	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	0.666	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	0.666	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	0.666	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	2.00	0.666	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	0.666	1

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-10
 Client ID: FIELD BLANK-5
 Sample Location: RANDOLPH

Date Collected: 02/09/22 12:44
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C4]Butanoic Acid (MPFBA)			102		50-200	
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)			97		50-200	
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)			106		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)			96		50-200	
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)			101		50-200	
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)			96		50-200	
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)			113		50-200	
Perfluoro[13C8]Octanoic Acid (M8PFOA)			101		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)			102		50-200	
Perfluoro[13C9]Nonanoic Acid (M9PFNA)			102		50-200	
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)			103		50-200	
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)			94		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)			91		50-200	
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)			98		50-200	
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)			95		50-200	
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)			101		50-200	

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-11
 Client ID: RANDOLPH-6
 Sample Location: RANDOLPH

Date Collected: 02/09/22 14:05
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 02/19/22 16:47
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 02/17/22 08:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	6.00		ng/l	1.91	0.638	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.91	0.638	1
Perfluoropentanoic Acid (PFPeA)	8.87		ng/l	1.91	0.638	1
Perfluorobutanesulfonic Acid (PFBS)	3.06		ng/l	1.91	0.638	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.91	0.638	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.91	0.638	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.91	0.638	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.91	0.638	1
Perfluorohexanoic Acid (PFHxA)	6.65		ng/l	1.91	0.638	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.91	0.638	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.91	0.638	1
Perfluoroheptanoic Acid (PFHpA)	3.97		ng/l	1.91	0.638	1
Perfluorohexanesulfonic Acid (PFHxS)	4.28		ng/l	1.91	0.638	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.91	0.638	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	1.80	J	ng/l	1.91	0.638	1
Perfluorooctanoic Acid (PFOA)	8.22		ng/l	1.91	0.638	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.91	0.638	1
Perfluorononanoic Acid (PFNA)	1.34	J	ng/l	1.91	0.638	1
Perfluorooctanesulfonic Acid (PFOS)	15.6		ng/l	1.91	0.959	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.91	0.638	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.91	0.638	1
Perfluorodecanoic Acid (PFDA)	0.688	J	ng/l	1.91	0.638	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.91	0.638	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.91	0.638	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.91	0.638	1

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-11
 Client ID: RANDOLPH-6
 Sample Location: RANDOLPH

Date Collected: 02/09/22 14:05
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C4]Butanoic Acid (MPFBA)			102		50-200	
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)			75		50-200	
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)			93		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)			147		50-200	
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)			89		50-200	
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)			89		50-200	
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)			96		50-200	
Perfluoro[13C8]Octanoic Acid (M8PFOA)			99		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)			167		50-200	
Perfluoro[13C9]Nonanoic Acid (M9PFNA)			109		50-200	
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)			102		50-200	
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)			98		50-200	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)			132		50-200	
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)			112		50-200	
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)			103		50-200	
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)			85		50-200	

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-12
 Client ID: FIELD BLANK-6
 Sample Location: RANDOLPH

Date Collected: 02/09/22 14:12
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 02/19/22 16:56
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 02/17/22 08:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.83	0.610	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.83	0.610	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.83	0.610	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.83	0.610	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.83	0.610	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.83	0.610	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.83	0.610	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.83	0.610	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.83	0.610	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.83	0.610	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.83	0.610	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.83	0.610	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.83	0.610	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.83	0.610	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.83	0.610	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.83	0.610	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.83	0.610	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.83	0.610	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.83	0.917	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.83	0.610	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.83	0.610	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.83	0.610	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.83	0.610	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.83	0.610	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.83	0.610	1

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-12
 Client ID: FIELD BLANK-6
 Sample Location: RANDOLPH

Date Collected: 02/09/22 14:12
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	104		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	99		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	109		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	95		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	105		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	99		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	115		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	103		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	101		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	106		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	105		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	98		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	92		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	104		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	101		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	106		50-200

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-13
 Client ID: RANDOLPH-7
 Sample Location: RANDOLPH

Date Collected: 02/09/22 14:40
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 02/19/22 17:05
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 02/17/22 08:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	1.73	J	ng/l	1.84	0.614	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.84	0.614	1
Perfluoropentanoic Acid (PFPeA)	1.47	J	ng/l	1.84	0.614	1
Perfluorobutanesulfonic Acid (PFBS)	0.920	J	ng/l	1.84	0.614	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.84	0.614	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.84	0.614	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.84	0.614	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.84	0.614	1
Perfluorohexanoic Acid (PFHxA)	1.25	J	ng/l	1.84	0.614	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.84	0.614	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.84	0.614	1
Perfluoroheptanoic Acid (PFHpA)	0.993	J	ng/l	1.84	0.614	1
Perfluorohexanesulfonic Acid (PFHxS)	0.883	J	ng/l	1.84	0.614	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.84	0.614	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.84	0.614	1
Perfluorooctanoic Acid (PFOA)	2.91		ng/l	1.84	0.614	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.84	0.614	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.84	0.614	1
Perfluorooctanesulfonic Acid (PFOS)	3.64		ng/l	1.84	0.924	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.84	0.614	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.84	0.614	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.84	0.614	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.84	0.614	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.84	0.614	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.84	0.614	1

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-13
 Client ID: RANDOLPH-7
 Sample Location: RANDOLPH

Date Collected: 02/09/22 14:40
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	101		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	77		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	93		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	139		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	89		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	89		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	103		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	95		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	145		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	103		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	106		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	87		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	109		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	96		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	92		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	88		50-200

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-14
 Client ID: FIELD BLANK-7
 Sample Location: RANDOLPH

Date Collected: 02/09/22 14:50
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 136,533
 Analytical Date: 02/19/22 17:13
 Analyst: MP

Extraction Method: EPA 533
 Extraction Date: 02/17/22 08:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.91	0.638	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.91	0.638	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.91	0.638	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.91	0.638	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.91	0.638	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.91	0.638	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.91	0.638	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.91	0.638	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.91	0.638	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.91	0.638	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.91	0.638	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.91	0.638	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.91	0.638	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.91	0.638	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.91	0.638	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.91	0.638	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.91	0.638	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.91	0.638	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.91	0.959	1
9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.91	0.638	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.91	0.638	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.91	0.638	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.91	0.638	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.91	0.638	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.91	0.638	1

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

SAMPLE RESULTS

Lab ID: L2206854-14
 Client ID: FIELD BLANK-7
 Sample Location: RANDOLPH

Date Collected: 02/09/22 14:50
 Date Received: 02/09/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	107		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	101		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	115		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	97		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	107		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	102		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	120		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	103		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	108		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	105		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	103		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	98		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	95		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	105		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	101		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	108		50-200

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 136,533
Analytical Date: 02/19/22 14:37
Analyst: MP

Extraction Method: EPA 533
Extraction Date: 02/17/22 08:00

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab for sample(s): 01-14 Batch: WG1605960-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	0.668
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	2.00	0.668
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	0.668
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	0.668
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	2.00	0.668
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEEESA)	ND		ng/l	2.00	0.668
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	2.00	0.668
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	0.668
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	2.00	0.668
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	2.00	0.668
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	0.668
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	0.668
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.800	J	ng/l	2.00	0.668
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	0.668
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	0.668
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	0.668
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	1.00
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	0.668
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	0.668
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	0.668
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	2.00	0.668
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	0.668

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 136,533
Analytical Date: 02/19/22 14:37
Analyst: MP

Extraction Method: EPA 533
Extraction Date: 02/17/22 08:00

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab for sample(s): 01-14 Batch: WG1605960-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	104		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	96		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	112		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	95		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	103		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	98		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	120		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	102		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	108		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	106		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	110		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	100		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	100		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	104		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	104		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	104		50-200

Lab Control Sample Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-14 Batch: WG1605960-2								
Perfluorobutanoic Acid (PFBA)	103		-		70-130	-		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	97		-		70-130	-		30
Perfluoropentanoic Acid (PFPeA)	107		-		70-130	-		30
Perfluorobutanesulfonic Acid (PFBS)	108		-		70-130	-		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	102		-		70-130	-		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEEESA)	108		-		70-130	-		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	100		-		70-130	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	103		-		70-130	-		30
Perfluorohexanoic Acid (PFHxA)	102		-		70-130	-		30
Perfluoropentanesulfonic Acid (PFPeS)	97		-		70-130	-		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	106		-		70-130	-		30
Perfluoroheptanoic Acid (PFHpA)	103		-		70-130	-		30
Perfluorohexanesulfonic Acid (PFHxS)	102		-		70-130	-		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	99		-		70-130	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	97		-		70-130	-		30
Perfluorooctanoic Acid (PFOA)	97		-		70-130	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	105		-		70-130	-		30
Perfluorononanoic Acid (PFNA)	98		-		70-130	-		30
Perfluorooctanesulfonic Acid (PFOS)	97		-		70-130	-		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	98		-		70-130	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	103		-		70-130	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

Parameter	LCS		LCSD		%Recovery Limits	RPD	RPD	
	%Recovery	Qual	%Recovery	Qual			Qual	Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-14 Batch: WG1605960-2								
Perfluorodecanoic Acid (PFDA)	101		-		70-130	-		30
Perfluoroundecanoic Acid (PFUnA)	102		-		70-130	-		30
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	97		-		70-130	-		30
Perfluorododecanoic Acid (PFDoA)	102		-		70-130	-		30

Surrogate (Extracted Internal Standard)	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
Perfluoro[13C4]Butanoic Acid (MPFBA)	104				50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	93				50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	109				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	103				50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	104				50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	98				50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	111				50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	102				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	113				50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	105				50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	108				50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	98				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	99				50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	104				50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	106				50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	106				50-200

Matrix Spike Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1605960-3 QC Sample: L2206854-01 Client ID:												
RANDOLPH-1												
Perfluorobutanoic Acid (PFBA)	3.72	161	168	102		-	-		70-130	-		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND	161	130	81		-	-		70-130	-		30
Perfluoropentanoic Acid (PFPeA)	3.94	161	175	106		-	-		70-130	-		30
Perfluorobutanesulfonic Acid (PFBS)	0.996J	143	152	106		-	-		70-130	-		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND	161	169	105		-	-		70-130	-		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND	144	157	109		-	-		70-130	-		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND	161	147	91		-	-		70-130	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	151	156	103		-	-		70-130	-		30
Perfluorohexanoic Acid (PFHxA)	3.29	161	164	100		-	-		70-130	-		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	152	145	96		-	-		70-130	-		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND	161	164	102		-	-		70-130	-		30
Perfluoroheptanoic Acid (PFHpA)	2.03	161	168	103		-	-		70-130	-		30
Perfluorohexanesulfonic Acid (PFHxS)	1.38J	147	146	99		-	-		70-130	-		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	152	143	94		-	-		70-130	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.651J	153	148	96		-	-		70-130	-		30
Perfluorooctanoic Acid (PFOA)	4.02	161	163	99		-	-		70-130	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	154	158	103		-	-		70-130	-		30
Perfluorononanoic Acid (PFNA)	0.766J	161	160	99		-	-		70-130	-		30
Perfluorooctanesulfonic Acid (PFOS)	4.10	150	145	94		-	-		70-130	-		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND	150	143	95		-	-		70-130	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	155	162	105		-	-		70-130	-		30

Matrix Spike Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1605960-3 QC Sample: L2206854-01 Client ID: RANDOLPH-1												
Perfluorodecanoic Acid (PFDA)	ND	161	160	99		-	-		70-130	-		30
Perfluoroundecanoic Acid (PFUnA)	ND	161	167	104		-	-		70-130	-		30
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND	152	136	89		-	-		70-130	-		30
Perfluorododecanoic Acid (PFDoA)	ND	161	163	101		-	-		70-130	-		30

Surrogate (Extracted Internal Standard)	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	98				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	141				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	133				50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	91				50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	87				50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	84				50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	92				50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	87				50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	103				50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	89				50-200
Perfluoro[13C4]Butanoic Acid (MPFBA)	99				50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	81				50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	103				50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	91				50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	93				50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	98				50-200

Lab Duplicate Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1605960-4 QC Sample: L2206854-03 Client ID: RANDOLPH-2						
Perfluorobutanoic Acid (PFBA)	5.28	5.27	ng/l	0		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND	ND	ng/l	NC		30
Perfluoropentanoic Acid (PFPeA)	5.32	5.31	ng/l	0		30
Perfluorobutanesulfonic Acid (PFBS)	2.64	2.61	ng/l	1		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND	ND	ng/l	NC		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND	ND	ng/l	NC		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	ND	ng/l	NC		30
Perfluorohexanoic Acid (PFHxA)	4.48	4.40	ng/l	2		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	ND	ng/l	NC		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND	ND	ng/l	NC		30
Perfluoroheptanoic Acid (PFHpA)	2.68	2.65	ng/l	1		30
Perfluorohexanesulfonic Acid (PFHxS)	1.95	1.94J	ng/l	NC		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.803J	0.832J	ng/l	NC		30
Perfluorooctanoic Acid (PFOA)	5.62	5.51	ng/l	2		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	ND	ng/l	NC		30
Perfluorononanoic Acid (PFNA)	1.26J	1.27J	ng/l	NC		30
Perfluorooctanesulfonic Acid (PFOS)	10.9	11.7	ng/l	7		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND	ND	ng/l	NC		30

Lab Duplicate Analysis

Batch Quality Control

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1605960-4 QC Sample: L2206854-03 Client ID: RANDOLPH-2						
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	ND	ng/l	NC		30
Perfluorodecanoic Acid (PFDA)	ND	ND	ng/l	NC		30
Perfluoroundecanoic Acid (PFUnA)	ND	ND	ng/l	NC		30
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND	ND	ng/l	NC		30
Perfluorododecanoic Acid (PFDoA)	ND	ND	ng/l	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	101		101		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	72		74		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	89		87		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	142		145		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	81		87		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	83		88		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	93		89		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	96		102		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	172		164		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	103		110		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	102		102		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	95		97		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	130		122		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	108		107		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	103		101		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	81		86		50-200

Project Name: BRH
Project Number: 102064

Lab Number: L2206854
Report Date: 02/25/22

Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information

Cooler **Custody Seal**
A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2206854-01A	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-01B	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-02A	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-03A	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-03B	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-04A	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-05A	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-05B	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-06A	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-07A	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-07B	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-08A	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-09A	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-09B	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-10A	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-11A	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-11B	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-12A	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-13A	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-13B	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)
L2206854-14A	Plastic 250ml Ammonium Acetate preserved	A	NA		1.3	Y	Absent		A2-533(28)

Project Name: BRH
Project Number: 102064

Serial_No:02252220:01
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PFAS PARAMETER SUMMARY

Parameter	Acronym	CAS Number
PERFLUOROALKYL CARBOXYLIC ACIDS (PFCAs)		
Perfluorooctadecanoic Acid	PFODA	16517-11-6
Perfluorohexadecanoic Acid	PFHxDA	67905-19-5
Perfluorotetradecanoic Acid	PFTA	376-06-7
Perfluorotridecanoic Acid	PFTrDA	72629-94-8
Perfluorododecanoic Acid	PFDoA	307-55-1
Perfluoroundecanoic Acid	PFUnA	2058-94-8
Perfluorodecanoic Acid	PFDA	335-76-2
Perfluorononanoic Acid	PFNA	375-95-1
Perfluorooctanoic Acid	PFOA	335-67-1
Perfluoroheptanoic Acid	PFHpA	375-85-9
Perfluorohexanoic Acid	PFHxA	307-24-4
Perfluoropentanoic Acid	PFPeA	2706-90-3
Perfluorobutanoic Acid	PFBA	375-22-4
PERFLUOROALKYL SULFONIC ACIDS (PFSAs)		
Perfluorododecanesulfonic Acid	PFDoDS	79780-39-5
Perfluorodecanesulfonic Acid	PFDS	335-77-3
Perfluorononanesulfonic Acid	PFNS	68259-12-1
Perfluorooctanesulfonic Acid	PFOS	1763-23-1
Perfluoroheptanesulfonic Acid	PFHpS	375-92-8
Perfluorohexanesulfonic Acid	PFHxS	355-46-4
Perfluoropentanesulfonic Acid	PFPeS	2706-91-4
Perfluorobutanesulfonic Acid	PFBS	375-73-5
FLUOROTELOMERS		
1H,1H,2H,2H-Perfluorododecanesulfonic Acid	10:2FTS	120226-60-0
1H,1H,2H,2H-Perfluorodecanesulfonic Acid	8:2FTS	39108-34-4
1H,1H,2H,2H-Perfluorooctanesulfonic Acid	6:2FTS	27619-97-2
1H,1H,2H,2H-Perfluorohexanesulfonic Acid	4:2FTS	757124-72-4
PERFLUOROALKANE SULFONAMIDES (FASAs)		
Perfluorooctanesulfonamide	FOSA	754-91-6
N-Ethyl Perfluorooctane Sulfonamide	NEtFOSA	4151-50-2
N-Methyl Perfluorooctane Sulfonamide	NMeFOSA	31506-32-8
PERFLUOROALKANE SULFONYL SUBSTANCES		
N-Ethyl Perfluorooctanesulfonamido Ethanol	NEtFOSE	1691-99-2
N-Methyl Perfluorooctanesulfonamido Ethanol	NMeFOSE	24448-09-7
N-Ethyl Perfluorooctanesulfonamidoacetic Acid	NEtFOSAA	2991-50-6
N-Methyl Perfluorooctanesulfonamidoacetic Acid	NMeFOSAA	2355-31-9
PER- and POLYFLUOROALKYL ETHER CARBOXYLIC ACIDS		
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid	HFPO-DA	13252-13-6
4,8-Dioxa-3h-Perfluorononanoic Acid	ADONA	919005-14-4
CHLORO-PERFLUOROALKYL SULFONIC ACIDS		
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid	11Cl-PF3OUdS	763051-92-9
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid	9Cl-PF3ONS	756426-58-1
PERFLUOROETHER SULFONIC ACIDS (PFESAs)		
Perfluoro(2-Ethoxyethane)Sulfonic Acid	PFEEESA	113507-82-7
PERFLUOROETHER/POLYETHER CARBOXYLIC ACIDS (PFPCAs)		
Perfluoro-3-Methoxypropanoic Acid	PFMPA	377-73-1
Perfluoro-4-Methoxybutanoic Acid	PFMBA	863090-89-5
Nonafluoro-3,6-Dioxaheptanoic Acid	NFDHA	151772-58-6

Project Name: BRH
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GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers



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Lab Number: L2206854
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Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

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Data Qualifiers

- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

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REFERENCES

- 136 Determination of Per- and Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution Anion Exchange Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS). EPA Method 533, EPA Document 815-B-19-020, November 2019.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 625/625.1: alpha-Terpeneol

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpeneol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LCHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

