Brunswick County Public Utilities - NC

PO Box 249
Bolivia, NC 28422-0249

Leland, NC

Client Project# NORTHWEST WATER PLANT
Samples Received: 8/30/2024

Analytical Report
0824-1357

PFAS by Isotope Dilution (non-potable water)

Report Issue Date: 10/10/2024

I certify that to the best of my knowledge all analytical data presented in this report have been checked for completeness, accuracy, errors and legibility in addition to having been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s). This analytical report was prepared in Portable Document Format (.PDF) and contains _31_ pages. This report shall not be reproduced except in full without approval of the laboratory. This will provide assurance that parts of the report are not taken out of context.

Amendment(s):

Signature:

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ENTHALPY ANALYTICAL

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Narrative Summary

Enthalpy Analytical Narrative Summary

Company	Brunswick County Public Utilities - NC
Job No.	0824-1357
Client ID.	NORTHWEST WATER PLANT Site: Leland, NC

1. Custody

Cherith McCullagh received the samples at 13.1 °C after being relinquished by Brunswick County Public Utilities - NC.

The samples were received in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, LLC.

Table 1 - Sample Inventory

EU Lab Sample ID	Client Sample ID	Matrix	Received
0824-1357-001-1A	083024-S01	aqueous	2024-08-30
0824-1357-001-2	083024-S01	aqueous	2024-08-30
0824-1357-002-1	083024-E01	aqueous	2024-08-30
0824-1357-002-2	083024-E01	aqueous	2024-08-30

2. Methods and Analytes

A list of analytes of interest and corresponding methods of analysis is shown in Table 3. Abbreviations are defined in the listed Appendices.

Table 3 - Methods and Analytes

EU Method	Analytes	Cleanup Method
EU-047	Brunswick List	ENVI-Carb
EU-047	PFPrA	N/A

3. Analysis

The samples were analyzed using Waters Acquity UPLC equipped with Xevo TQ MS (LC/MS/MS "Pippin"). The samples were analyzed using Sciex Triple Quad 7500 (LC/MS/MS "Samwise").

The samples were analyzed using more than one extraction batch and analytical sequence to meet method acceptance criteria.

4. Calibration

In the initial calibration, the reported analytes exhibited R^2 of ≥ 0.99. The reported analytes in the calibration standards, Initial Calibration Verification (ICV) and continuing calibration (concal) met the accuracy criterion for native analytes.

Enthalpy Analytical Narrative Summary

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5. QC Notes

Ongoing Precision Recovery (OPR) control limits have not been established for some analytes of interest.

Except where noted below, the QC sample analyses passed all method criteria.

PFTrDA exceeded method recovery criteria in OPR_18070_PFAS but was not detected >LOQ in the samples. Data is reported without adverse impact.

Select extraction standards (ES) fell outside method recovery criteria in the QC samples. Target analytes are quantified based on their ratio to their labeled standard analogs. When detected at a signal-to-noise above 10:1 the ES peak area is used to quantify its respective target analyte using accepted isotope dilution principles. The data is reported without adverse impact.

PFAS by Isotope Dilution (non-potable water) samples were extracted within 28 days, and extracts analyzed within 28 days.

6. Reporting Notes

The results presented in this report are representative of the samples as provided to the laboratory.

Some labeled extraction standards in the sample analyses fell outside the control limits for ES recovery, as denoted by the "Q" qualifier. The target analytes are quantified based on their ratio to their labeled standard analogs. As a result, low or high labeled standard recovery do not cause any change to ratios or contribute any additional error in the measurement of the target analytes. The data have been accepted and reported with no further actions.

These analyses met the requirements of the TNI Standard. Any deviations from the requirements of the reference method or TNI Standard have been stated above.

Enthalpy Analytical, LLC in Wilmington NC is accredited by the Louisiana Department of Environmental Quality to the 2009 TNI Standard under certificate number 05075.

General Reporting Notes – Data Qualifiers

The following are general reporting notes that are applicable to all Enthalpy Analytical, LLC - Wilmington, NC data reports, unless specifically noted otherwise.

General Data Qualifiers

- Ac - Alternate calculation flag indicates the es recovery was calculated using the opening concal when either of the following situations is encountered in the data processing software: the ES recovery is over 400% or the JS is not detected.
- B – The analyte was found in the method blank, at a concentration that was at least 10% of the amount in the sample.
- Cxx – Two or more congeners co-elute. In EDDs, C denotes the lowest IUPAC congener in a co-elution group and additional co-eluters for the group ('xx') are shown with the number of the lowest IUPAC co-eluter**.**
- E – The reported concentration exceeds the calibration range (upper point of the calibration curve). For HRMS data, this condition does not imply additional measurement uncertainty. For LC-MS/MS data, these values should be considered as having measurement uncertainty higher than values within the calibration range.
- EDL – Estimated Detection Level: The EDL is unique to isotope dilution methods and reflects the conditions of analysis at the time of analysis, including the equipment used. Where the MDL is a static value, the EDL is a dynamic value.
- EMPC – Estimated Maximum Possible Concentration: EMPC is specific to Dioxin/Furan tests to indicate the determined ion-abundance ratio was outside the allowed theoretical range (usually due to being near the detection limit, although it can very rarely be caused by a co-eluting interference). The EMPC concentration is adjusted to reflect the value at the theoretical ion-abundance ratio.
- I/IR – The ion ratio between the primary and secondary ions was observed to be outside the method criteria. The analyte concentration may be inaccurate due to interference.
- J – The analyte has a concentration below the minimum calibration level (LOQ value) but greater than the LOD. These values should be considered as having measurement uncertainty higher than values within the calibration range
- L - For reports containing PFAS analytes only, this flag indicates that an analyte has a concentration below the Minimum Detection Limit (MDL) . The reported concentration is not recommended for regulatory use as the analyte signal may have a signal-to-noise ratio less than the criteria deemed necessary to be considered a detected analyte.
- LOD – Limit of Detection: For reports conforming to the DOD ELAP QSM, this is the QSM-defined LOD. For reports conforming to TNI requirements (but not DOD ELAP QSM requirements), this value is the minimum detection limit (MDL). The LOD is adjusted for sample weight or volume.

- LOQ – Limit of Quantitation: For reports conforming to the DOD ELAP QSM, this is the QSM-defined LOQ. For reports conforming to TNI requirements (but not DOD ELAP QSM requirements), this value is the reporting limit (RL). The LOQ is adjusted for sample weight or volume.
- <LOD() – Analyte was not found at a concentration high enough to be reported as detected. It is reported as less than the LOD, and the LOD is given in the parentheses.
- <LOQ() – Analyte was not found at a concentration high enough to be reported as above the QSM-defined LOQ or TNI defined Reporting Limit. It is reported as less than the LOQ, and the LOQ is given in the parentheses.
- ND – Indicates a non-detect.
- NR – Indicates a value that is not reportable due to issues observed in sample preparation or analysis.
- PR – The associated congener(s) is(are) poorly resolved.
- QI – Indicates the presence of a quantitative interference.
- RL – Reporting Limit. Lowest reportable value. The level is higher than the MDL.
- SI – Denotes "Single Ion Mode" and is utilized for PCBs where the secondary ion trace has a significantly elevated noise level due to background PFK. Responses for such peaks are calculated using an EMPC approach based solely on the primary ion area(s) and may be considered estimates.
- U – The analyte was not detected.
- V / Q – The labeled standard recovery is not within method control limits.
- X – Indicates the result is from re-injection/repeat/second-column analysis.

Lab Identifiers/ Data Attributes

- AR – Indicates use of the archived portion of the sample extract.
- CU – Indicates a sample that required additional clean-up prior to HRMS injection/processing.
- D – Dilution Data. Result was obtained from the analysis of a dilution. The number that follows the "D" indicates the dilution factor.
- DE – Indicates a dilution performed with the addition of ES (Extraction Standard) solution.
- DUP – Designation for a duplicate sample.
- MS – Designation for a matrix spike.
- MSD – Designation for a matrix spike duplicate.

General Reporting Notes – Data Qualifiers

- R – Indicates a re-extraction of the sample.
- RJ – Indicates a reinjection of the sample extract.
- S – Indicates a sample split. The number that follows the "S" indicates the split factor.
- SAT – Indicates an analyte saturated the detector.

	PFAS Compound Acronym List		
	Acronym	**CAS #**	**Compound Name**
	*** accredited for SOP EU047 / EPA method 1633**		***# Method 537.1 Accredited ^ Method 533 Accredited ~EPA 1633 extended list***
	Target Analytes		
*, ^	PFBA	375-22-4	Perfluorobutanoic Acid
*, #, ^	PFPeA	2706-90-3	Perfluoropentanoic Acid
*, #, ^	PFHxA	307-24-4	Perfluorohexanoic Acid
*, #, ^	PFHpA	375-85-9	Perfluoroheptanoic Acid
*, #, ^	PFOA	335-67-1	Perfluorooctanoic Acid
*, #, ^	PFNA	375-95-1	Perfluorononanoic Acid
*, #, ^	PFDA	335-76-2	Perfluorodecanoic acid
*, #, ^	PFUnA (PFUnDA)	2058-94-8	Perfluoroundecanoic acid
*, #	PFDoA (PFDoDA)	307-55-1	Perfluorododecanoic acid
*, #	PFTrDA (PFTriA)	72629-94-8	Perfluorotridecanoic acid
*, #, ^	PFTeDA (PFTA)	376-06-7	Perfluorotetradecanoic acid
*, ^	PFBS	375-73-5	Perfluorobutane sulfonic acid
*, #, ^	PFPeS	2706-91-4	Perfluoropentane sulfonic acid
*, ^	PFHxS	355-46-4	Perfluorohexane sulfonic acid
*, #, ^	PFHpS	375-92-8	Perfluoroheptane sulfonic acid
*, #, ^	PFOS	1763-23-1	Perfluorooctane sulfonic acid
*	PFNS	68259-12-1	Perfluorononane sulfonic acid
*	PFDS	335-77-3	Perfluorodecane sulfonic acid
*, ^	4:2 FTS	757124-72-4	4:2 fluorotelomer sulfonic acid
*, ^	6:2 FTS	27619-97-2	6:2 fluorotelomer sulfonic acid
*, ^	8:2 FTS	39108-34-4	8:2 fluorotelomer sulfonic acid
~	10:2 FTS	120226-60-0	Fluorotelomer sulfonate 10:2
~	FHxSA	41997-13-1	Perfluorohexanesulfonamide
*	PFOSA (FOSA)	754-91-6	Perfluorooctane sulfonamide
*, #	N-MeFOSAA	2355-31-9	N-methyl perfluorooctane sulfonamido acetic acid
*	N-MeFOSA	31506-32-8	N-methylperfluoro-1-octanesulfonamide
*	N-MeFOSE	24448-09-7	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
*, #	N-EtFOSAA	2991-50-6	N-ethyl perfluorooctane sulfonamido acetic acid
*	N-EtFOSA	4151-50-2	N-ethylperfluoro-1-octanesulfonamide
*	N-EtFOSE	1691-99-2	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
*, #, ^	HFPO-DA	13252-13-6	2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (Gen-X)
*, #, ^	11Cl-PF3OUdS	763051-92-9	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
*, #, ^	9Cl-PF3ONS	756426-58-1	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
*, #, ^	ADONA	919005-14-4	4,8-dioxa-3H-perfluorononanoic acid
*, ^	PFEESA	113507-82-7	Perfluoro(2-ethoxyethane)sulphonic acid
*, ^	PFMOBA (PFMBA)	863090-89-5	Perfluoro-4-methoxybutanic acid
*, ^	NFDHA	151772-58-6	Nonafluoro-3,6-dioxaheptanoic acid
*, ^	PFMOPrA (PFMPA)	377-73-1	Perfluoro-3-methoxypropanoic acid
~	PFPrA	422-64-0	2,2,3,3,3-Pentafluoropropionic acid
~	PFPrS (PFPS)	423-41-6	Perfluoropropanesulfonic acid
~	PFMOAA	674-13-5	Perfluoro-2-methoxyacetic acid
~	PFO2HxA	39492-88-1	Perfluoro (3,5-dioxahexanoic) acid
~	PFO3OA	39492-89-2	Perfluoro (3,5,7-trioxaoctanoic) acid
~	PFO4DA	39492-90-5	Perfluoro (3,5,7,9-tetraoxadecanoic) acid
~	PFO5DA	39492-91-6	Perfluoro(3,5,7,9,11-pentaoxadodecanoic) acid
~	Nafion Byproduct 1 (PS Acid)	29311-67-9	Nafion Byproduct 1
~	Nafion Byproduct 2 (Hydro-PS Acid)	749836-20-2	Nafion Byproduct 2
~	PEPA	267239-61-2	Perfluoro-2-ethoxypropanoic acid
~	PMPA	13140-29-9	Perfluoro-2-methoxypropanoic acid

PFAS Compound Acronym List			
	Acronym	CAS #	Compound Name
	* accredited for SOP EU047 / EPA method 1633		*# Method 537.1 Accredited ^ Method 533 Accredited ~EPA 1633 extended list*
~	PFECA-G	801212-59-9	4-(Heptafluoroisopropoxy)hexafluorobutanoic acid
~	PFHxDA	67905-19-5	Perfluorohexadecanoic acid
~	R-PSDA (Nafion Byproduct 4)	2416366-18-0	Perfluoro-4-(2-sulfoethoxy)pentanoic acid
~	Hydrolyzed PSDA (Nafion Byproduct 5)	2416366-19-1	2-fluoro-2-[1,1,2,3,3,3-hexafluoro-2-(1,1,2,2-tetrafluoro-2-sulfoethoxy)propoxy]-acetic acid
~	R-PSDCA (Nafion Byproduct 6)	2416366-21-5	1,1,2,2-tetrafluoro-2-[1,2,2,3,3-pentafluoro-1-(trifluoromethyl)propoxy] ethanesulfonic acid
~	EVE Acid	69087-46-3	2,2,3,3-tetrafluoro-3-({1,1,1,2,3,3-hexafluoro-3-[(1,2,2-trifluoroethenyl)oxy]propan-2-yl}oxy)propionic acid
~	FBSA	30334-69-1	Perfluorobutylsulfonamide
~	MeFBSA	68298-12-4	1-Butanesulfonamide; (N-(Methyl)nonafluorobutanesulfonamide)
~	Hydro-EVE Acid	773804-62-9	2,2,3,3-Tetrafluoro-3-{[1,1,1,2,3,3-hexafluoro-3-(1,2,2,2-tetrafluoroethoxy)propan-2-yl]oxy}propanoic acid
~	R-EVE Acid	2416366-22-6	4-(2-carboxy-1,1,2,2-tetrafluoroethoxy)-2,2,3,3,4,5,5,5-octafluoro-pentanoic acid
~	NVHOS	1132933-86-8	Perfluoroethoxysulfonic acid
*~	PFDoS	79780-39-5	Perfluorododecane sulfonic acid
~	PFODA	16517-11-6	Perfluorooctadecanoic acid
*	3:3 FTCA	356-02-5	2H,2H,3H,3H-Perfluorohexanoic acid
*	5:3 FTCA	914637-49-3	2H,2H,3H,3H-Perfluorooctanoic acid
*	7:3 FTCA	812-70-4	2H,2H,3H,3H-Perfluorodecanoic acid
~	N-AP-FHxSA	50598-28-2	N-(3-(Dimethylamino)propyl)tridecafluoro-1-hexanesulfonamide
~	N-CMAmP-6:2 FOSA	34455-29-3	N-(Carboxymethyl)-N,N-dimethyl-3-(((3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl)amino)1-propanaminium
~	BPAF	1478-61-1	Bisphenol AF
~	HQ-115	90076-65-6	Bis(trifluoromethane)sulfonimide lithium salt

Results

Enthalpy Analytical

Job No.: 0824-1357-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT Leland, NC

Summary

	Compound	CAS	083024-S01 ng/L	083024-E01 ng/L
Acids	PFBA	375-22-4	5.63	5.09
	PFPeA	2706-90-3	7.66	8.01
	PFHxA	307-24-4	7.32	7.69
	PFHpA	375-85-9	3.14	3.90
	PFOA	335-67-1	6.25	6.82
	PFNA	375-95-1	0.917	0.989
	PFDA	335-76-2	0.492 J	0.564 J
	PFUnDA	2058-94-8	0.0590 L	0.0790 L
	PFDoDA	307-55-1	ND U	ND U
	PFTrDA	72629-94-8	ND U	ND U
	PFTeDA	376-06-7	ND U	ND U
	PFHxDA	67905-19-5	ND U	ND U
Sulfonates	PFBS	375-73-5	4.33	4.97
	PFPeS	2706-91-4	0.692	0.657
	PFHxS	355-46-4	3.15	4.33
	PFHpS	375-92-8	0.265 L	0.212 L
	PFOS	1763-23-1	13.5	14.5
	PFNS	68259-12-1	ND U	ND U
	PFDS	335-77-3	ND U	ND U
	4:2 FTS	757124-72-4	ND U	ND U
	6:2 FTS	27619-97-2	0.159 L	0.202 L
	8:2 FTS	39108-34-4	ND U	ND U
	10:2 FTS	120226-60-0	ND U	ND U
Sulfonamidos	FBSA	30334-69-1	0.480 J	0.720
	N-EtFOSA	4151-50-2	ND U	ND U
	N-EtFOSAA	2991-50-6	ND U	ND U
	N-EtFOSE	1691-99-2	ND U	ND U
	N-MeFOSA	31506-32-8	ND U	ND U
	N-MeFOSAA	2355-31-9	ND U	ND U
	N-MeFOSE	24448-09-7	ND U	ND U
	PFOSA	754-91-6	0.0179 L	ND U
PFECAs	ADONA	919005-14-4	ND U	ND U
	EVE Acid	69087-46-3	ND U	ND U
	HFPO-DA	13252-13-6	1.65	1.71
	Hydro-EVE Acid	773804-62-9	ND U	ND U
	NFDHA	151772-58-6	ND U	ND U
	PEPA	267239-61-2	1.59	1.94
	PFECA-G	801212-59-9	ND U	ND U
	PFMOAA	674-13-5	22.5	23.8
	PFMOBA	863090-89-5	ND U	ND U
	PFMOPrA	377-73-1	ND U	ND U
	PFO2HxA	39492-88-1	4.11	3.22
	PFO3OA	39492-89-2	0.783	0.967
	PFO4DA	39492-90-5	0.249 L	ND U
	PFO5DA	39492-91-6	0.0713 L	ND U
	PMPA	13140-29-9	5.35	4.96
	R-EVE	2416366-22-6	3.18	3.18
PFESAs	11Cl-PF3OUdS	763051-92-9	ND U	ND U
	9Cl-PF3ONS	756426-58-1	ND U	ND U
	Hydrolyzed PSDA	2416366-19-1	0.789	0.713
	Nafion Byproduct 1 (PS Acid)	29311-67-9	ND U	ND U
	Nafion Byproduct 2 (Hydro-PS Acid)	749836-20-2	0.253 L	0.340 L
	NVHOS	1132933-86-8	ND U	ND U
	PFEESA	113507-82-7	ND U	ND U
	R-PSDA	2416366-18-0	3.00	3.04
	R-PSDCA	2416366-21-5	ND U	ND U

Enthalpy Analytical

Job No.: 0824-1357-2 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT Leland, NC

Summary

	Compound	CAS	083024-S01 ng/L	083024-E01 ng/L
Acids	PFPrA	422-64-0	ND U	ND U

Enthalpy Analytical

Job No.: 0824-1357-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT Leland, NC

Details

Sample Name	083024-S01		
Sampling Site			
Enthalpy ID	0824-1357-001-1A	Prep Batch	EU18125
Matrix	aqueous	Analyst	rappelle
Sampling Date	2024-08-30 13:15	Instrument	Pippin
Received Date	2024-08-30	Sample Vol mL	271.71
Prep Date	2024-09-13 12:50	Extract Vol mL	0.4
AnalysisDate	2024-09-17 06:22	Split Factor	N/A
SampleType	Sample	Method Code	EU-047-NPW
Bottle ID	B		

	Compound	CAS	Injection File Name	Sample Concentration ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags
Acids	PFBA	375-22-4	P160924041	5.63	0.234	0.589			
	PFPeA	2706-90-3	P160924041	7.66	0.168	0.589			
	PFHxA	307-24-4	P160924041	7.32	0.197	0.589			
	PFHpA	375-85-9	P160924041	3.14	0.206	0.589			
	PFOA	335-67-1	P160924041	6.25	0.135	0.589			
	PFNA	375-95-1	P160924041	0.917	0.133	0.589			
	PFDA	335-76-2	P160924041	0.492	0.168	0.589			J
	PFUnDA	2058-94-8	P160924041	0.0590	0.133	0.589			L
	PFDoDA	307-55-1	P160924041	ND	0.239	0.589			U
	PFTrDA	72629-94-8	P160924041	ND	0.195	0.589			U
	PFTeDA	376-06-7	P160924041	ND	0.225	0.589			U
	PFHxDA	67905-19-5	P160924041	ND	0.313	0.589			U
Sulfonates	PFBS	375-73-5	P160924041	4.33	0.313	0.589			
	PFPeS	2706-91-4	P160924041	0.692	0.121	0.555			
	PFHxS	355-46-4	P160924041	3.15	0.455	0.539			
	PFHpS	375-92-8	P160924041	0.265	0.285	0.561			L
	PFOS	1763-23-1	P160924041	13.5	0.311	0.545			
	PFNS	68259-12-1	P160924041	ND	0.183	0.567			U
	PFDS	335-77-3	P160924041	ND	0.309	0.567			U
	4:2 FTS	757124-72-4	P160924041	ND	0.0764	0.552			U
	6:2 FTS	27619-97-2	P160924041	0.159	0.278	0.561			L
	8:2 FTS	39108-34-4	P160924041	ND	0.132	0.564			U
	10:2 FTS	120226-60-0	P160924041	ND	0.451	0.589			U
Sulfonamidos	FBSA	30334-69-1	P160924041	0.480	0.280	0.589			J
	N-EtFOSA	4151-50-2	P160924041	ND	0.364	0.589			U
	N-EtFOSAA	2991-50-6	P160924041	ND	0.239	0.589			U
	N-EtFOSE	1691-99-2	P160924041	ND	0.902	2.65			U
	N-MeFOSA	31506-32-8	P160924041	ND	0.243	0.589			U
	N-MeFOSAA	2355-31-9	P160924041	ND	0.165	0.589			U
	N-MeFOSE	24448-09-7	P160924041	ND	0.559	2.65			U
	PFOSA	754-91-6	P160924041	0.0179	0.0826	0.589			L
PFECAs	ADONA	919005-14-4	P160924041	ND	0.160	0.558			U
	EVE Acid	69087-46-3	P160924041	ND	0.188	1.32			U
	HFPO-DA	13252-13-6	P160924041	1.65	0.0624	0.589			
	Hydro-EVE Acid	773804-62-9	P160924041	ND	0.193	0.589			U
	NFDHA	151772-58-6	P160924041	ND	0.124	0.589			U
	PEPA	267239-61-2	P160924041	1.59	0.110	0.589			
	PFECA-G	801212-59-9	P160924041	ND	0.0786	0.589			U
	PFMOAA	674-13-5	P160924041	22.5	0.298	0.589			
	PFMOBA	863090-89-5	P160924041	ND	0.988	1.32			U
	PFMOPrA	377-73-1	P160924041	ND	0.210	0.589			U
	PFO2HxA	39492-88-1	P160924041	4.11	0.190	0.589			
	PFO3OA	39492-89-2	P160924041	0.783	0.271	0.589			
	PFO4DA	39492-90-5	P160924041	0.249	0.466	2.94			L
	PFO5DA	39492-91-6	P160924041	0.0713	0.471	2.94			L
	PMPA	13140-29-9	P160924041	5.35	0.139	0.589			
	R-EVE	2416366-22-6	P160924041	3.18	0.977	1.32			
PFESAs	11Cl-PF3OUdS	763051-92-9	P160924041	ND	0.278	0.555			U
	9Cl-PF3ONS	756426-58-1	P160924041	ND	0.377	0.549			U
	Hydrolyzed PSDA	2416366-19-1	P160924041	0.789	0.392	0.589			
	Nafion Byproduct 1 (PS Acid)	29311-67-9	P160924041	ND	0.315	0.589			U
	Nafion Byproduct 2 (Hydro-PS Acid)	749836-20-2	P160924041	0.253	0.488	0.589			L
	NVHOS	1132933-86-8	P160924041	ND	0.0907	0.589			U
	PFEESA	113507-82-7	P160924041	ND	0.177	0.589			U
	R-PSDA	2416366-18-0	P160924041	3.00	2.59	2.59			
	R-PSDCA	2416366-21-5	P160924041	ND	0.248	0.589			U
ES	MPFBA		P160924041				20-150%	81.1%	
	M5PFPeA		P160924041				20-150%	189%	Q
	M3PFBS		P160924041				20-150%	214%	Q
	M2-4:2 FTS		P160924041				20-150%	124%	
	M5PFHxA		P160924041				20-150%	83.8%	
	M3HFPO-DA		P160924041				20-150%	84.0%	
	M4PFHpA		P160924041				20-150%	86.8%	

Enthalpy Analytical

Job No.: 0824-1357-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT Leland, NC

Details

Sample Name	083024-S01		
Sampling Site			
Enthalpy ID	0824-1357-001-1A	Prep Batch	EU18125
Matrix	aqueous	Analyst	rappelle
Sampling Date	2024-08-30 13:15	Instrument	Pippin
Received Date	2024-08-30	Sample Vol mL	271.71
Prep Date	2024-09-13 12:50	Extract Vol mL	0.4
AnalysisDate	2024-09-17 06:22	Split Factor	N/A
SampleType	Sample	Method Code	EU-047-NPW
Bottle ID	B		

	Compound	CAS	Injection File Name	Sample Concentration ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags
	M3PFHxS		P160924041				20-150%	91.5%	
	M2-6:2 FTS		P160924041				20-150%	93.2%	
	M8PFOA		P160924041				20-150%	86.5%	
	M9PFNA		P160924041				20-150%	82.7%	
	M8PFOS		P160924041				20-150%	82.8%	
	M2-8:2 FTS		P160924041				20-150%	83.8%	
	M8FOSA-I		P160924041				20-150%	75.3%	
	M6PFDA		P160924041				20-150%	87.2%	
	d3-N-MeFOSAA		P160924041				20-150%	81.3%	
	d5-N-EtFOSAA		P160924041				20-150%	76.7%	
	M7PFUdA		P160924041				20-150%	83.4%	
	MPFDoA		P160924041				20-150%	72.1%	
	M2PFTeDA		P160924041				20-150%	46.9%	
	d3-N-MeFOSA		P160924041				10-200%	21.0%	
	d5-N-EtFOSA		P160924041				10-200%	19.7%	
	d7-N-MeFOSE		P160924041				10-200%	47.3%	
	d9-N-EtFOSE		P160924041				10-200%	44.2%	

Enthalpy Analytical

Job No.: 0824-1357-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT Leland, NC

Details

Sample Name	083024-E01		
Sampling Site			
Enthalpy ID	0824-1357-002-1	Prep Batch	eu18070
Matrix	aqueous	Analyst	rappelle
Sampling Date	2024-08-30 13:15	Instrument	Pippin
Received Date	2024-08-30	Sample Vol mL	277.35
Prep Date	2024-09-05 07:20	Extract Vol mL	0.4
AnalysisDate	2024-09-07 23:18	Split Factor	N/A
SampleType	Sample	Method Code	EU-047-NPW
Bottle ID	A		

	Compound	CAS	Injection File Name	Sample Concentration ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags
Acids	PFBA	375-22-4	P060924085	5.09	0.229	0.577			
	PFPeA	2706-90-3	P060924085	8.01	0.165	0.577			
	PFHxA	307-24-4	P060924085	7.69	0.193	0.577			
	PFHpA	375-85-9	P060924085	3.90	0.202	0.577			
	PFOA	335-67-1	P060924085	6.82	0.132	0.577			
	PFNA	375-95-1	P060924085	0.989	0.130	0.577			
	PFDA	335-76-2	P060924085	0.564	0.165	0.577			J
	PFUnDA	2058-94-8	P060924085	0.0790	0.130	0.577			L
	PFDoDA	307-55-1	P060924085	ND	0.234	0.577			U
	PFTrDA	72629-94-8	P060924085	ND	0.191	0.577			U
	PFTeDA	376-06-7	P060924085	ND	0.220	0.577			U
	PFHxDA	67905-19-5	P060924085	ND	0.306	0.577			U
Sulfonates	PFBS	375-73-5	P060924085	4.97	0.306	0.577			
	PFPeS	2706-91-4	P060924085	0.657	0.118	0.543			
	PFHxS	355-46-4	P060924085	4.33	0.445	0.528			
	PFHpS	375-92-8	P060924085	0.212	0.279	0.550			L
	PFOS	1763-23-1	P060924085	14.5	0.305	0.534			
	PFNS	68259-12-1	P060924085	ND	0.179	0.556			U
	PFDS	335-77-3	P060924085	ND	0.303	0.556			U
	4:2 FTS	757124-72-4	P060924085	ND	0.0748	0.540			U
	6:2 FTS	27619-97-2	P060924085	0.202	0.272	0.550			L
	8:2 FTS	39108-34-4	P060924085	ND	0.129	0.553			U
	10:2 FTS	120226-60-0	P060924085	ND	0.442	0.577			U
Sulfonamidos	FBSA	30334-69-1	P060924085	0.720	0.274	0.577			
	N-EtFOSA	4151-50-2	P060924085	ND	0.357	0.577			U
	N-EtFOSAA	2991-50-6	P060924085	ND	0.234	0.577			U
	N-EtFOSE	1691-99-2	P060924085	ND	0.883	2.60			U
	N-MeFOSA	31506-32-8	P060924085	ND	0.238	0.577			U
	N-MeFOSAA	2355-31-9	P060924085	ND	0.162	0.577			U
	N-MeFOSE	24448-09-7	P060924085	ND	0.548	2.60			U
	PFOSA	754-91-6	P060924085	ND	0.0809	0.577			U
PFECAs	ADONA	919005-14-4	P060924085	ND	0.156	0.547			U
	EVE Acid	69087-46-3	P060924085	ND	0.184	1.30			U
	HFPO-DA	13252-13-6	P060924085	1.71	0.0611	0.577			
	Hydro-EVE Acid	773804-62-9	P060924085	ND	0.189	0.577			U
	NFDHA	151772-58-6	P060924085	ND	0.121	0.577			U
	PEPA	267239-61-2	P060924085	1.94	0.108	0.577			
	PFECA-G	801212-59-9	P060924085	ND	0.0770	0.577			U
	PFMOAA	674-13-5	P060924085	23.8	0.292	0.577			
	PFMOBA	863090-89-5	P060924085	ND	0.968	1.30			U
	PFMOPrA	377-73-1	P060924085	ND	0.206	0.577			U
	PFO2HxA	39492-88-1	P060924085	3.22	0.186	0.577			
	PFO3OA	39492-89-2	P060924085	0.967	0.265	0.577			
	PFO4DA	39492-90-5	P060924085	ND	0.456	2.88			U
	PFO5DA	39492-91-6	P060924085	ND	0.462	2.88			U
	PMPA	13140-29-9	P060924085	4.96	0.136	0.577			
	R-EVE	2416366-22-6	P060924085	3.18	0.957	1.30			
PFESAs	11Cl-PF3OUdS	763051-92-9	P060924085	ND	0.272	0.543			U
	9Cl-PF3ONS	756426-58-1	P060924085	ND	0.370	0.537			U
	Hydrolyzed PSDA	2416366-19-1	P250924033	0.713	0.384	0.577			
	Nafion Byproduct 1 (PS Acid)	29311-67-9	P060924085	ND	0.308	0.577			U
	Nafion Byproduct 2 (Hydro-PS Acid)	749836-20-2	P060924085	0.340	0.478	0.577			L
	NVHOS	1132933-86-8	P060924085	ND	0.0889	0.577			U
	PFEESA	113507-82-7	P060924085	ND	0.173	0.577			U
	R-PSDA	2416366-18-0	P060924085	3.04	2.54	2.54			
	R-PSDCA	2416366-21-5	P060924085	ND	0.243	0.577			U
ES	MPFBA		P060924085				20-150%	87.8%	
	M5PFPeA		P060924085				20-150%	209%	Q
	M3PFBS		P060924085				20-150%	271%	Q
	M2-4:2 FTS		P060924085				20-150%	139%	
	M5PFHxA		P060924085				20-150%	91.0%	
	M3HFPO-DA		P060924085				20-150%	82.3%	
	M4PFHpA		P060924085				20-150%	85.3%	

Enthalpy Analytical

Job No.: 0824-1357-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT Leland, NC

Details

Sample Name	083024-E01		
Sampling Site			
Enthalpy ID	0824-1357-002-1	Prep Batch	eu18070
Matrix	aqueous	Analyst	rappelle
Sampling Date	2024-08-30 13:15	Instrument	Pippin
Received Date	2024-08-30	Sample Vol mL	277.35
Prep Date	2024-09-05 07:20	Extract Vol mL	0.4
AnalysisDate	2024-09-07 23:18	Split Factor	N/A
SampleType	Sample	Method Code	EU-047-NPW
Bottle ID	A		

	Compound	CAS	Injection File Name	Sample Concentration ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags
	M3PFHxS		P060924085				20-150%	96.3%	
	M2-6:2 FTS		P060924085				20-150%	154%	Q
	M8PFOA		P060924085				20-150%	91.5%	
	M9PFNA		P060924085				20-150%	85.6%	
	M8PFOS		P060924085				20-150%	86.3%	
	M2-8:2 FTS		P060924085				20-150%	78.9%	
	M8FOSA-I		P060924085				20-150%	81.4%	
	M6PFDA		P060924085				20-150%	78.6%	
	d3-N-MeFOSAA		P060924085				20-150%	62.9%	
	d5-N-EtFOSAA		P060924085				20-150%	63.8%	
	M7PFUdA		P060924085				20-150%	70.8%	
	MPFDoA		P060924085				20-150%	51.3%	
	M2PFTeDA		P060924085				20-150%	19.8%	Q
	d3-N-MeFOSA		P060924085				10-200%	12.4%	
	d5-N-EtFOSA		P060924085				10-200%	9.00%	Q
	d7-N-MeFOSE		P060924085				10-200%	30.5%	
	d9-N-EtFOSE		P060924085				10-200%	21.6%	

Enthalpy Analytical

Job No.: 0824-1357-2 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT Leland, NC

Details

Sample Name	083024-S01		
Sampling Site			
Enthalpy ID	0824-1357-001-2	Prep Batch	EU18124
Matrix	aqueous	Analyst	jogres
Sampling Date	2024-08-30 13:15	Instrument	Samwise
Received Date	2024-08-30	Sample Vol mL	0.1
Prep Date	2024-09-13 11:38	Extract Vol mL	0.2
AnalysisDate	2024-09-19 15:39	Split Factor	N/A
SampleType	Sample	Method Code	EU-047-NPW
Bottle ID	B		

	Compound	CAS	Injection File Name	Sample Concentration ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags
Acids	PFPrA	422-64-0	SW190924-09191539	ND	700	1530			U
ES	13C3-PFPrA		SW190924-09191539				20-150%	176%	Q

Enthalpy Analytical

Job No.: 0824-1357-2 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT Leland, NC

Details

Sample Name	083024-E01		
Sampling Site			
Enthalpy ID	0824-1357-002-2	Prep Batch	EU18124
Matrix	aqueous	Analyst	jogres
Sampling Date	2024-08-30 13:15	Instrument	Samwise
Received Date	2024-08-30	Sample Vol mL	0.1
Prep Date	2024-09-13 11:38	Extract Vol mL	0.2
AnalysisDate	2024-09-19 15:51	Split Factor	N/A
SampleType	Sample	Method Code	EU-047-NPW
Bottle ID	B		

	Compound	CAS	Injection File Name	Sample Concentration ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags
Acids	PFPrA	422-64-0	SW190924-09191551	ND	700	1530			U
ES	13C3-PFPrA		SW190924-09191551				20-150%	177%	Q

QC Data

Enthalpy Analytical

Job No.: 0824-1357-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT Leland, NC

Details

Sample Name	MB_18070_PFAS		
Sampling Site			
Enthalpy ID	MB_18070_PFAS	Prep Batch	eu18070
Matrix	aqueous	Analyst	rappelle
Sampling Date		Instrument	Pippin
Received Date		Sample Vol mL	250
Prep Date	2024-09-05 07:20	Extract Vol mL	0.4
AnalysisDate	2024-09-07 16:29	Split Factor	N/A
SampleType	Blank	Method Code	EU-047-NPW
Bottle ID	-		

	Compound	CAS	Injection File Name	Sample Concentration ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags
Acids	PFBA	375-22-4	P060924067	ND	0.254	0.640			U
	PFPeA	2706-90-3	P060924067	ND	0.183	0.640			U
	PFHxA	307-24-4	P060924067	ND	0.214	0.640			U
	PFHpA	375-85-9	P060924067	ND	0.224	0.640			U
	PFOA	335-67-1	P060924067	ND	0.146	0.640			U
	PFNA	375-95-1	P060924067	ND	0.145	0.640			U
	PFDA	335-76-2	P060924067	ND	0.183	0.640			U
	PFUnDA	2058-94-8	P060924067	ND	0.145	0.640			U
	PFDoDA	307-55-1	P060924067	ND	0.260	0.640			U
	PFTrDA	72629-94-8	P060924067	ND	0.212	0.640			U
	PFTeDA	376-06-7	P060924067	ND	0.244	0.640			U
	PFHxDA	67905-19-5	P060924067	ND	0.340	0.640			U
Sulfonates	PFBS	375-73-5	P060924067	ND	0.340	0.640			U
	PFPeS	2706-91-4	P060924067	ND	0.131	0.603			U
	PFHxS	355-46-4	P060924067	ND	0.494	0.586			U
	PFHpS	375-92-8	P060924067	ND	0.310	0.610			U
	PFOS	1763-23-1	P060924067	ND	0.338	0.593			U
	PFNS	68259-12-1	P060924067	ND	0.199	0.616			U
	PFDS	335-77-3	P060924067	ND	0.336	0.616			U
	4:2 FTS	757124-72-4	P060924067	ND	0.0830	0.600			U
	6:2 FTS	27619-97-2	P060924067	ND	0.302	0.610			U
	8:2 FTS	39108-34-4	P060924067	ND	0.143	0.613			U
	10:2 FTS	120226-60-0	P060924067	ND	0.490	0.640			U
Sulfonamidos	FBSA	30334-69-1	P060924067	ND	0.304	0.640			U
	N-EtFOSA	4151-50-2	P060924067	ND	0.396	0.640			U
	N-EtFOSAA	2991-50-6	P060924067	ND	0.260	0.640			U
	N-EtFOSE	1691-99-2	P060924067	ND	0.980	2.88			U
	N-MeFOSA	31506-32-8	P060924067	ND	0.264	0.640			U
	N-MeFOSAA	2355-31-9	P060924067	ND	0.180	0.640			U
	N-MeFOSE	24448-09-7	P060924067	ND	0.608	2.88			U
	PFOSA	754-91-6	P060924067	0.479	0.0898	0.640			J
PFECAs	ADONA	919005-14-4	P060924067	ND	0.173	0.606			U
	EVE Acid	69087-46-3	P060924067	ND	0.204	1.44			U
	HFPO-DA	13252-13-6	P060924067	ND	0.0678	0.640			U
	Hydro-EVE Acid	773804-62-9	P060924067	ND	0.210	0.640			U
	NFDHA	151772-58-6	P060924067	ND	0.135	0.640			U
	PEPA	267239-61-2	P060924067	ND	0.120	0.640			U
	PFECA-G	801212-59-9	P060924067	ND	0.0854	0.640			U
	PFMOAA	674-13-5	P060924067	ND	0.324	0.640			U
	PFMOBA	863090-89-5	P060924067	ND	1.07	1.44			U
	PFMOPrA	377-73-1	P060924067	ND	0.228	0.640			U
	PFO2HxA	39492-88-1	P060924067	ND	0.206	0.640			U
	PFO3OA	39492-89-2	P060924067	ND	0.294	0.640			U
	PFO4DA	39492-90-5	P060924067	ND	0.506	3.20			U
	PFO5DA	39492-91-6	P060924067	ND	0.512	3.20			U
	PMPA	13140-29-9	P060924067	ND	0.151	0.640			U
	R-EVE	2416366-22-6	P060924067	ND	1.06	1.44			U
PFESAs	11Cl-PF3OUdS	763051-92-9	P060924067	ND	0.302	0.603			U
	9Cl-PF3ONS	756426-58-1	P060924067	ND	0.410	0.596			U
	Hydrolyzed PSDA	2416366-19-1	P250924031	ND	0.426	0.640			U
	Nafion Byproduct 1 (PS Acid)	29311-67-9	P060924067	ND	0.342	0.640			U
	Nafion Byproduct 2 (Hydro-PS Acid)	749836-20-2	P060924067	ND	0.530	0.640			U
	NVHOS	1132933-86-8	P060924067	ND	0.0986	0.640			U
	PFEESA	113507-82-7	P060924067	ND	0.192	0.640			U
	R-PSDA	2416366-18-0	P060924067	ND	2.82	2.82			U
	R-PSDCA	2416366-21-5	P060924067	ND	0.270	0.640			U
ES	MPFBA		P060924067				20-150%	94.1%	
	M5PFPeA		P060924067				20-150%	103%	
	M3PFBS		P060924067				20-150%	89.2%	
	M2-4:2 FTS		P060924067				20-150%	88.2%	
	M5PFHxA		P060924067				20-150%	88.2%	
	M3HFPO-DA		P060924067				20-150%	102%	
	M4PFHpA		P060924067				20-150%	80.7%	

Enthalpy Analytical

Job No.: 0824-1357-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT Leland, NC

Details

Sample Name	MB_18070_PFAS		
Sampling Site			
Enthalpy ID	MB_18070_PFAS	Prep Batch	eu18070
Matrix	aqueous	Analyst	rappelle
Sampling Date		Instrument	Pippin
Received Date		Sample Vol mL	250
Prep Date	2024-09-05 07:20	Extract Vol mL	0.4
AnalysisDate	2024-09-07 16:29	Split Factor	N/A
SampleType	Blank	Method Code	EU-047-NPW
Bottle ID	-		

	Compound	CAS	Injection File Name	Sample Concentration ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags
	M3PFHxS		P060924067				20-150%	91.7%	
	M2-6:2 FTS		P060924067				20-150%	113%	
	M8PFOA		P060924067				20-150%	89.3%	
	M9PFNA		P060924067				20-150%	85.3%	
	M8PFOS		P060924067				20-150%	83.7%	
	M2-8:2 FTS		P060924067				20-150%	69.2%	
	M8FOSA-I		P060924067				20-150%	53.3%	
	M6PFDA		P060924067				20-150%	82.7%	
	d3-N-MeFOSAA		P060924067				20-150%	63.0%	
	d5-N-EtFOSAA		P060924067				20-150%	61.8%	
	M7PFUdA		P060924067				20-150%	76.1%	
	MPFDoA		P060924067				20-150%	58.1%	
	M2PFTeDA		P060924067				20-150%	35.9%	
	d3-N-MeFOSA		P060924067				10-200%	0.587%	Q
	d5-N-EtFOSA		P060924067				10-200%	0.953%	Q
	d7-N-MeFOSE		P060924067				10-200%	26.8%	
	d9-N-EtFOSE		P060924067				10-200%	27.7%	

Enthalpy Analytical

Job No.: 0824-1357-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT Leland, NC

Details

Sample Name	MB_18125_PFAS		
Sampling Site			
Enthalpy ID	MB_18125_PFAS	Prep Batch	EU18125
Matrix	aqueous	Analyst	rappelle
Sampling Date		Instrument	Pippin
Received Date		Sample Vol mL	250
Prep Date	2024-09-13 12:50	Extract Vol mL	0.4
AnalysisDate	2024-09-17 04:29	Split Factor	N/A
SampleType	Blank	Method Code	EU-047-NPW
Bottle ID	-		

	Compound	CAS	Injection File Name	Sample Concentration ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags
Acids	PFBA	375-22-4	P160924036	ND	0.254	0.640			U
	PFPeA	2706-90-3	P160924036	ND	0.183	0.640			U
	PFHxA	307-24-4	P160924036	ND	0.214	0.640			U
	PFHpA	375-85-9	P160924036	ND	0.224	0.640			U
	PFOA	335-67-1	P160924036	ND	0.146	0.640			U
	PFNA	375-95-1	P160924036	ND	0.145	0.640			U
	PFDA	335-76-2	P160924036	ND	0.183	0.640			U
	PFUnDA	2058-94-8	P160924036	ND	0.145	0.640			U
	PFDoDA	307-55-1	P160924036	ND	0.260	0.640			U
	PFTrDA	72629-94-8	P160924036	ND	0.212	0.640			U
	PFTeDA	376-06-7	P160924036	ND	0.244	0.640			U
	PFHxDA	67905-19-5	P160924036	ND	0.340	0.640			U
Sulfonates	PFBS	375-73-5	P160924036	ND	0.340	0.640			U
	PFPeS	2706-91-4	P160924036	ND	0.131	0.603			U
	PFHxS	355-46-4	P160924036	ND	0.494	0.586			U
	PFHpS	375-92-8	P160924036	ND	0.310	0.610			U
	PFOS	1763-23-1	P160924036	ND	0.338	0.593			U
	PFNS	68259-12-1	P160924036	ND	0.199	0.616			U
	PFDS	335-77-3	P160924036	ND	0.336	0.616			U
	4:2 FTS	757124-72-4	P160924036	ND	0.0830	0.600			U
	6:2 FTS	27619-97-2	P160924036	ND	0.302	0.610			U
	8:2 FTS	39108-34-4	P160924036	ND	0.143	0.613			U
	10:2 FTS	120226-60-0	P160924036	ND	0.490	0.640			U
Sulfonamidos	FBSA	30334-69-1	P160924036	ND	0.304	0.640			U
	N-EtFOSA	4151-50-2	P160924036	ND	0.396	0.640			U
	N-EtFOSAA	2991-50-6	P160924036	ND	0.260	0.640			U
	N-EtFOSE	1691-99-2	P160924036	ND	0.980	2.88			U
	N-MeFOSA	31506-32-8	P160924036	ND	0.264	0.640			U
	N-MeFOSAA	2355-31-9	P160924036	ND	0.180	0.640			U
	N-MeFOSE	24448-09-7	P160924036	ND	0.608	2.88			U
	PFOSA	754-91-6	P160924036	ND	0.0898	0.640			U
PFECAs	ADONA	919005-14-4	P160924036	ND	0.173	0.606			U
	EVE Acid	69087-46-3	P160924036	ND	0.204	1.44			U
	HFPO-DA	13252-13-6	P160924036	ND	0.0678	0.640			U
	Hydro-EVE Acid	773804-62-9	P160924036	ND	0.210	0.640			U
	NFDHA	151772-58-6	P160924036	ND	0.135	0.640			U
	PEPA	267239-61-2	P160924036	ND	0.120	0.640			U
	PFECA-G	801212-59-9	P160924036	ND	0.0854	0.640			U
	PFMOAA	674-13-5	P160924036	ND	0.324	0.640			U
	PFMOBA	863090-89-5	P160924036	ND	1.07	1.44			U
	PFMOPrA	377-73-1	P160924036	ND	0.228	0.640			U
	PFO2HxA	39492-88-1	P160924036	ND	0.206	0.640			U
	PFO3OA	39492-89-2	P160924036	ND	0.294	0.640			U
	PFO4DA	39492-90-5	P160924036	ND	0.506	3.20			U
	PFO5DA	39492-91-6	P160924036	ND	0.512	3.20			U
	PMPA	13140-29-9	P160924036	ND	0.151	0.640			U
	R-EVE	2416366-22-6	P160924036	ND	1.06	1.44			U
PFESAs	11Cl-PF3OUdS	763051-92-9	P160924036	ND	0.302	0.603			U
	9Cl-PF3ONS	756426-58-1	P160924036	ND	0.410	0.596			U
	Hydrolyzed PSDA	2416366-19-1	P160924036	ND	0.426	0.640			U
	Nafion Byproduct 1 (PS Acid)	29311-67-9	P160924036	ND	0.342	0.640			U
	Nafion Byproduct 2 (Hydro-PS Acid)	749836-20-2	P160924036	ND	0.530	0.640			U
	NVHOS	1132933-86-8	P160924036	ND	0.0986	0.640			U
	PFEESA	113507-82-7	P160924036	ND	0.192	0.640			U
	R-PSDA	2416366-18-0	P160924036	ND	2.82	2.82			U
	R-PSDCA	2416366-21-5	P160924036	ND	0.270	0.640			U
ES	MPFBA		P160924036				20-150%	82.4%	
	M5PFPeA		P160924036				20-150%	85.8%	
	M3PFBS		P160924036				20-150%	79.8%	
	M2-4:2 FTS		P160924036				20-150%	89.7%	
	M5PFHxA		P160924036				20-150%	83.5%	
	M3HFPO-DA		P160924036				20-150%	87.8%	
	M4PFHpA		P160924036				20-150%	85.1%	

Enthalpy Analytical

Job No.: 0824-1357-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT Leland, NC

Details

Sample Name	MB_18125_PFAS		
Sampling Site			
Enthalpy ID	MB_18125_PFAS	Prep Batch	EU18125
Matrix	aqueous	Analyst	rappelle
Sampling Date		Instrument	Pippin
Received Date		Sample Vol mL	250
Prep Date	2024-09-13 12:50	Extract Vol mL	0.4
AnalysisDate	2024-09-17 04:29	Split Factor	N/A
SampleType	Blank	Method Code	EU-047-NPW
Bottle ID	-		

	Compound	CAS	Injection File Name	Sample Concentration ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags
	M3PFHxS		P160924036				20-150%	90.4%	
	M2-6:2 FTS		P160924036				20-150%	85.0%	
	M8PFOA		P160924036				20-150%	83.3%	
	M9PFNA		P160924036				20-150%	83.3%	
	M8PFOS		P160924036				20-150%	83.5%	
	M2-8:2 FTS		P160924036				20-150%	82.4%	
	M8FOSA-I		P160924036				20-150%	43.1%	
	M6PFDA		P160924036				20-150%	86.0%	
	d3-N-MeFOSAA		P160924036				20-150%	79.1%	
	d5-N-EtFOSAA		P160924036				20-150%	75.4%	
	M7PFUdA		P160924036				20-150%	82.8%	
	MPFDoA		P160924036				20-150%	73.2%	
	M2PFTeDA		P160924036				20-150%	50.5%	
	d3-N-MeFOSA		P160924036				10-200%	2.36%	Q
	d5-N-EtFOSA		P160924036				10-200%	2.37%	Q
	d7-N-MeFOSE		P160924036				10-200%	38.3%	
	d9-N-EtFOSE		P160924036				10-200%	38.2%	

Enthalpy Analytical

Job No.: 0824-1357-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT Leland, NC

Enthalpy ID	OPR_18070_PFAS	Prep Batch	eu18070	Sample Vol (mL)	250
Sample Name	OPR_18070_PFAS	Prep Date	2024-09-05 07:20	Extract Vol (mL)	0.4
Matrix	aqueous	Analysis Date	2024-09-07 16:52	Split Factor	N/A
Sampling Date		Analyst	rappelle	Method Code	EU-047-NPW
Received Date		Instrument	Pippin	Sample Type	Control
		Bottle ID	-		

	Compound	CAS	InjFileName	Sample Concentration ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags
Acids	PFBA	375-22-4	P060924068	19.2	0.254	0.640	69.1-122%	96.0%	
	PFPeA	2706-90-3	P060924068	18.6	0.183	0.640	68.5-121%	92.9%	
	PFHxA	307-24-4	P060924068	18.6	0.214	0.640	68.3-121%	92.8%	
	PFHpA	375-85-9	P060924068	20.3	0.224	0.640	62.4-128%	101%	
	PFOA	335-67-1	P060924068	18.4	0.146	0.640	66.3-124%	92.0%	
	PFNA	375-95-1	P060924068	17.8	0.145	0.640	70.5-120%	88.8%	
	PFDA	335-76-2	P060924068	19.6	0.183	0.640	68.9-117%	97.9%	
	PFUnDA	2058-94-8	P060924068	18.8	0.145	0.640	58.1-132%	94.2%	
	PFDoDA	307-55-1	P060924068	20.5	0.260	0.640	52.1-140%	102%	
	PFTrDA	72629-94-8	P110924034	30.7	0.212	0.640	65-144%	154%	Q
	PFTeDA	376-06-7	P060924068	19.4	0.244	0.640	36.1-161%	97.2%	
Sulfonates	PFBS	375-73-5	P060924068	17.7	0.340	0.640	67.5-111.6%	99.7%	
	PFPeS	2706-91-4	P060924068	17.9	0.131	0.603	51.8-142%	95.1%	
	PFHxS	355-46-4	P060924068	17.9	0.494	0.586	59.6-128%	98.0%	
	PFHpS	375-92-8	P060924068	20.1	0.310	0.610	46.9-157%	105%	
	PFOS	1763-23-1	P060924068	17.4	0.338	0.593	59.2-132%	93.7%	
	PFNS	68259-12-1	P060924068	16.1	0.199	0.616	53.9-133%	83.5%	
	PFDS	335-77-3	P060924068	13.5	0.336	0.616	38.1-142%	69.9%	
	4:2 FTS	757124-72-4	P060924068	18.7	0.0830	0.600	61.9-131%	99.8%	
	6:2 FTS	27619-97-2	P060924068	18.8	0.302	0.610	62.3-129%	99.0%	
	8:2 FTS	39108-34-4	P060924068	20.3	0.143	0.613	37.5-159%	106%	
Sulfonamidos	N-EtFOSAA	2991-50-6	P060924068	20.6	0.260	0.640	61.5-133%	103%	
	N-MeFOSAA	2355-31-9	P060924068	20.9	0.180	0.640	57.3-138%	105%	
	PFOSA	754-91-6	P060924068	20.0	0.0898	0.640	49.1-143%	99.8%	
PFECAs	HFPO-DA	13252-13-6	P060924068	16.5	0.0678	0.640	57.2-130%	82.6%	
ES	MPFBA		P060924068				20-150%	99.0%	
	M5PFPeA		P060924068				20-150%	111%	
	M3PFBS		P060924068				20-150%	96.3%	
	M2-4:2 FTS		P060924068				20-150%	101%	
	M5PFHxA		P060924068				20-150%	101%	
	M3HFPO-DA		P060924068				20-150%	119%	
	M4PFHpA		P060924068				20-150%	96.6%	
	M3PFHxS		P060924068				20-150%	112%	
	M2-6:2 FTS		P060924068				20-150%	135%	
	M8PFOA		P060924068				20-150%	104%	
	M9PFNA		P060924068				20-150%	94.5%	
	M8PFOS		P060924068				20-150%	97.2%	
	M2-8:2 FTS		P060924068				20-150%	79.0%	
	M8FOSA-I		P060924068				20-150%	79.9%	
	M6PFDA		P060924068				20-150%	91.8%	
	d3-N-MeFOSAA		P060924068				20-150%	71.3%	
	d5-N-EtFOSAA		P060924068				20-150%	65.0%	
	M7PFUdA		P060924068				20-150%	78.0%	
	MPFDoA		P060924068				20-150%	48.3%	
	M2PFTeDA		P060924068				20-150%	19.3%	Q

Enthalpy Analytical

Job No.: 0824-1357-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT Leland, NC

Enthalpy ID	OPR_18125_PFAS	Prep Batch	EU18125	Sample Vol (mL)	250
Sample Name	OPR_18125_PFAS	Prep Date	2024-09-13 12:50	Extract Vol (mL)	0.4
Matrix	aqueous	Analysis Date	2024-09-17 04:51	Split Factor	N/A
Sampling Date		Analyst	rappelle	Method Code	EU-047-NPW
Received Date		Instrument	Pippin	Sample Type	Control
		Bottle ID	-		

	Compound	CAS	InjFileName	Sample Concentration ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags
Acids	PFBA	375-22-4	P160924037	18.2	0.254	0.640	69.1-122%	91.2%	
	PFPeA	2706-90-3	P160924037	19.0	0.183	0.640	68.5-121%	95.1%	
	PFHxA	307-24-4	P160924037	18.9	0.214	0.640	68.3-121%	94.6%	
	PFHpA	375-85-9	P160924037	18.3	0.224	0.640	62.4-128%	91.5%	
	PFOA	335-67-1	P160924037	18.7	0.146	0.640	66.3-124%	93.4%	
	PFNA	375-95-1	P160924037	19.2	0.145	0.640	70.5-120%	96.2%	
	PFDA	335-76-2	P160924037	19.4	0.183	0.640	68.9-117%	97.0%	
	PFUnDA	2058-94-8	P160924037	18.0	0.145	0.640	58.1-132%	90.1%	
	PFDoDA	307-55-1	P160924037	19.4	0.260	0.640	52.1-140%	96.9%	
	PFTrDA	72629-94-8	P160924037	21.3	0.212	0.640	65-144%	107%	
	PFTeDA	376-06-7	P160924037	19.8	0.244	0.640	36.1-161%	99.1%	
Sulfonates	PFBS	375-73-5	P160924037	17.8	0.340	0.640	67.5-111.6%	100%	
	PFPeS	2706-91-4	P160924037	18.0	0.131	0.603	51.8-142%	95.5%	
	PFHxS	355-46-4	P160924037	14.7	0.494	0.586	59.6-128%	80.6%	
	PFHpS	375-92-8	P160924037	18.0	0.310	0.610	46.9-157%	94.3%	
	PFOS	1763-23-1	P160924037	17.2	0.338	0.593	59.2-132%	92.9%	
	PFNS	68259-12-1	P160924037	17.9	0.199	0.616	53.9-133%	93.3%	
	PFDS	335-77-3	P160924037	17.5	0.336	0.616	38.1-142%	90.8%	
	4:2 FTS	757124-72-4	P160924037	18.0	0.0830	0.600	61.9-131%	96.1%	
	6:2 FTS	27619-97-2	P160924037	18.4	0.302	0.610	62.3-129%	96.6%	
	8:2 FTS	39108-34-4	P160924037	18.4	0.143	0.613	37.5-159%	95.8%	
Sulfonamidos	N-EtFOSAA	2991-50-6	P160924037	18.8	0.260	0.640	61.5-133%	93.8%	
	N-MeFOSAA	2355-31-9	P160924037	18.0	0.180	0.640	57.3-138%	89.8%	
	PFOSA	754-91-6	P160924037	18.9	0.0898	0.640	49.1-143%	94.6%	
PFECAs	HFPO-DA	13252-13-6	P160924037	17.0	0.0678	0.640	57.2-130%	85.2%	
ES	MPFBA		P160924037				20-150%	85.6%	
	M5PFPeA		P160924037				20-150%	85.8%	
	M3PFBS		P160924037				20-150%	83.2%	
	M2-4:2 FTS		P160924037				20-150%	86.4%	
	M5PFHxA		P160924037				20-150%	85.4%	
	M3HFPO-DA		P160924037				20-150%	93.1%	
	M4PFHpA		P160924037				20-150%	85.6%	
	M3PFHxS		P160924037				20-150%	95.8%	
	M2-6:2 FTS		P160924037				20-150%	88.3%	
	M8PFOA		P160924037				20-150%	86.2%	
	M9PFNA		P160924037				20-150%	83.0%	
	M8PFOS		P160924037				20-150%	85.3%	
	M2-8:2 FTS		P160924037				20-150%	85.7%	
	M8FOSA-I		P160924037				20-150%	65.7%	
	M6PFDA		P160924037				20-150%	85.0%	
	d3-N-MeFOSAA		P160924037				20-150%	84.4%	
	d5-N-EtFOSAA		P160924037				20-150%	80.1%	
	M7PFUdA		P160924037				20-150%	84.3%	
	MPFDoA		P160924037				20-150%	80.6%	
	M2PFTeDA		P160924037				20-150%	69.9%	

Enthalpy Analytical

Job No.: 0824-1357-2 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT Leland, NC

Details

Sample Name	MB_18124_PFAS		
Sampling Site			
Enthalpy ID	MB_18124_PFAS	Prep Batch	EU18124
Matrix	aqueous	Analyst	jogres
Sampling Date		Instrument	Samwise
Received Date		Sample Vol mL	0.1
Prep Date	2024-09-13 11:38	Extract Vol mL	0.2
AnalysisDate	2024-09-19 15:15	Split Factor	N/A
SampleType	Blank	Method Code	EU-047-NPW
Bottle ID	-		

	Compound	CAS	Injection File Name	Sample Concentration ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags
Acids	PFPrA	422-64-0	SW190924-09191515	ND	700	1530			U
ES	13C3-PFPrA		SW190924-09191515				20-150%	175%	Q

Enthalpy Analytical

Job No.: 0824-1357-2 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT Leland, NC

Details

Sample Name	OPR_18124_PFAS		
Sampling Site			
Enthalpy ID	OPR_18124_PFAS	Prep Batch	EU18124
Matrix	aqueous	Analyst	jogres
Sampling Date		Instrument	Samwise
Received Date		Sample Vol mL	0.08
Prep Date	2024-09-13 11:38	Extract Vol mL	0.2
AnalysisDate	2024-09-19 15:27	Split Factor	N/A
SampleType	Control	Method Code	EU-047-NPW
Bottle ID	-		

	Compound	CAS	Injection File Name	Sample Concentration ng/L	LOD ng/L	LOQ ng/L	Recovery Limits	Recovery	Flags
Acids	PFPrA	422-64-0	SW190924-09191527	13800	875	1910	40-150%	55.3%	
ES	13C3-PFPrA		SW190924-09191527				20-150%	169%	Q

Sample Custody

ENTHALPY analytical

0824-1357

Chain of Custody Record

Enthalpy Ultratrace Job#: _____ **COC Page** 1 of 1

Special Handling:

X Standard Turn Around Time

☐ Rush Turn Around Time -- Date Needed_____

• All Fast TATs Subject to Approval by Enthalpy Analytical, Inc.

• All Samples Disposed of After 6 months Unless Otherwise Instructed.

Enthalpy Analytical-Wilmington, NC has added enhancements to standard methods to improve accuracy, precision and permit an assessment of laboratory performance in the context of your specific data needs. For more information email Cindy.James@enthalpy.com.

Client Name: **BRUNSWICK COUNTY UTILITIES**

Project Manager: **GLENN WALKER**

Report To: **SAME**

Project Number:_____

Site Name: **NORTHWEST WATER PLANT**

Location: **LELAND N.C.**

PO#:_____

Telephone#:_____

Email:_____

This Chain of Custody is applicable to Non-Air samples. Standard TAT differ per analysis and are provided by request.

Client Special Instructions:

Matrix: GW-Groundwater, WW-Wastewater, NW-Non-Potable Water, DW-Drinking Water, S-Soil, SL-Sludge, BT-Biological Tissue, O-Other

Type: G=Grab C=Composite Q=Quality Control

Sample ID	Date	Time	Sample Volume	Type	Matrix	Sample Containers: # of Bottles	# of Jars	# of Bags	# Other	Analyses: Method 1613	Method 8290	Method 1668A/B/C PCBs	PFAS by LC/MS/MS	PAHs by HRGC/HRMS	Sample on Hold	Method 23	ALL PFAS	Notes:
083024-S01	8/30/2024	1:15 PM	250 ml	G	NW	2											X	Please Add PFPrA and
083024-E01	8/30/2024	1:15 PM	250 ml	G	DW	2											X	PFHpA To The Testing.
																		Mark Hager Knows About
																		This If you Have Questions

Relinquished By:	Date:	Received By:	Date:	Time:	Sample Temperature Upon Receipt:
PHIL MCCULLOCH	8/30/2024	C. McCulloch	8-30-24	1450	☑ Iced ☐ Ambient °C 13.1
					☐ Iced ☐ Ambient °C_____
					☐ Iced ☐ Ambient °C_____

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JOB ID: 0824-1357 Date / Time: 8/30/24 1450 Initials: C.A.M

OR

Client: Brunswick Co. Utilities

Cooler 1 of 1

Temp °C: 13.1 Thermometer ID: TIS

Received via: FedEx ☐ UPS ☐ DHL ☐ USPS ☐ Courier ☑ Other ☐

Check one		Check one			Yes	No
On ice:	☑	in a Box:	☐	Cooler seals:	☐	☑
Melted ice:	☐	in a Cooler:	☑	Sample seals:	☐	☑
Ambient:	☐	Cooler in Box:	☐	Good condition:	☑	☐

Comment:

Cooler ____ of ____

Temp °C: ____ Thermometer ID: ____

Received via: FedEx ☐ UPS ☐ DHL ☐ USPS ☐ Courier ☐ Other ☐

Check one		Check one			Yes	No
On ice:	☐	in a Box:	☐	Cooler seals:	☐	☐
Melted ice:	☐	in a Cooler:	☐	Sample seals:	☐	☐
Ambient:	☐	Cooler in Box:	☐	Good condition:	☐	☐

Comment:

Cooler ____ of ____

Temp °C: ____ Thermometer ID: ____

Received via: FedEx ☐ UPS ☐ DHL ☐ USPS ☐ Courier ☐ Other ☐

Check one		Check one			Yes	No
On ice:	☐	in a Box:	☐	Cooler seals:	☐	☐
Melted ice:	☐	in a Cooler:	☐	Sample seals:	☐	☐
Ambient:	☐	Cooler in Box:	☐	Good condition:	☐	☐

Comment:

This Is The Last Page Of This Report.