# Brunswick County Public Utilities - NC

PO Box 249
Bolivia, NC 28422-0249

## LELAND N.C.

Client Project# NORHWEST WATER PLANT
Samples Received: 3/28/2025

Analytical Report
0325-1208

PFAS by Isotope Dilution (non-potable water)

Report Issue Date: 4/23/2025

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 28 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:

Laura Boivin, QA Associate II

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# Narrative Summary

# Enthalpy Analytical Narrative Summary

| | |
|---|---|
| Company | Brunswick County Public Utilities - NC |
| Job No. | 0325-1208-1 |
| Client ID. | NORHWEST WATER PLANT Site: LELAND N.C. |

**1. Custody**

Jayson-Shane Santos received the samples at 6.2 °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 |
|---|---|---|---|
| 0325-1208-001-2 | 032825-SO1 | aqueous | 2025-03-28 |
| 0325-1208-001-2A | 032825-SO1 | aqueous | 2025-03-28 |
| 0325-1208-002-2 | 032825-EO1 | aqueous | 2025-03-28 |
| 0325-1208-002-2A | 032825-EO1 | aqueous | 2025-03-28 |

**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 |
|---|---|---|
| EU047 | Brunswick List | ENVI-Carb |

**3. Analysis**

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

The samples were analyzed using more than one batch preparation to include all analytes of interest.

PFPrA was analyzed by direct injection for polar compounds.

**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, except as noted below.

# Enthalpy Analytical Narrative Summary

| | |
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The Standards that did not were:

• SID BH57 (PFMOBA, PFOSA)
• SID BH58 (PFDS, PFHpS, PFMOBA)

Analyte(s) that exceeded method control limits in the concals were not detected >LOQ in the samples. The data is reported without adverse impact.

**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.

QC samples that did not meet method acceptance criteria were:

• MB_19201_PFAS (M2PFTeDA, d3-N-MeFOSA, d5-N-EtFOSA)
• OPR_19201_PFAS (M2-4:2 FTS, d3-N-MeFOSA, d5-N-EtFOSA)

See additional Reporting Notes below.

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.

This report provides all results including detections below LOD following client instruction.

Some labeled extraction standards (ES) in the analyses recovered outside method 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. 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.

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 2016 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 | | | Methods | | | | | |
|---|---|---|---|---|---|---|---|---|
| Acronym | CAS # | Compound Name | SOP EU047 | EPA 1633 (B-24) | EPA 1633X | EPA 537.1 | EPA 533 | EPA 8327* |
| Target Analytes | | | | | | | | |
| PFBA | 375-22-4 | Perfluorobutanoic Acid | X | X | X | | X | X |
| PFPeA | 2706-90-3 | Perfluoropentanoic Acid | X | X | X | | X | X |
| PFHxA | 307-24-4 | Perfluorohexanoic Acid | X | X | X | X | X | X |
| PFHpA | 375-85-9 | Perfluoroheptanoic Acid | X | X | X | X | X | X |
| PFOA | 335-67-1 | Perfluorooctanoic Acid | X | X | X | X | X | X |
| PFNA | 375-95-1 | Perfluorononanoic Acid | X | X | X | X | X | X |
| PFDA | 335-76-2 | Perfluorodecanoic acid | X | X | X | X | X | X |
| PFUnA (PFUnDA) | 2058-94-8 | Perfluoroundecanoic acid | X | X | X | X | X | X |
| PFDoA (PFDoDA) | 307-55-1 | Perfluorododecanoic acid | X | X | X | X | | X |
| PFTrDA (PFTriA, PFTrDA) | 72629-94-8 | Perfluorotridecanoic acid | X | X | X | X | | X |
| PFTeDA (PFTA, PFTreA) | 376-06-7 | Perfluorotetradecanoic acid | X | X | X | X | | X |
| PFBS | 375-73-5 | Perfluorobutane sulfonic acid | X | X | X | X | X | X |
| PFPeS | 2706-91-4 | Perfluoropentane sulfonic acid | X | X | X | | X | X |
| PFHxS | 355-46-4 | Perfluorohexane sulfonic acid | X | X | X | X | X | X |
| PFHpS | 375-92-8 | Perfluoroheptane sulfonic acid | X | X | X | | X | X |
| PFOS | 1763-23-1 | Perfluorooctane sulfonic acid | X | X | X | X | X | X |
| PFNS | 68259-12-1 | Perfluorononane sulfonic acid | X | X | X | | | X |
| PFDS | 335-77-3 | Perfluorodecane sulfonic acid | X | X | X | | | X |
| 4:2 FTS | 757124-72-4 | 4:2 fluorotelomer sulfonic acid | X | X | X | | X | X |
| 6:2 FTS | 27619-97-2 | 6:2 fluorotelomer sulfonic acid | X | X | X | | X | X |
| 8:2 FTS | 39108-34-4 | 8:2 fluorotelomer sulfonic acid | X | X | X | | X | X |
| 10:2 FTS | 120226-60-0 | Fluorotelomer sulfonate 10:2 | | | | | | X |
| FHxSA | 41997-13-1 | Perfluorohexanesulfonamide | | | X | | | X |
| PFOSA (FOSA) | 754-91-6 | Perfluorooctane sulfonamide | X | X | X | | | X |
| N-MeFOSAA | 2355-31-9 | N-methyl perfluorooctane sulfonamido acetic acid | X | X | X | X | | X |
| N-MeFOSA | 31506-32-8 | N-methylperfluoro-1-octanesulfonamide | X | X | X | | | X |
| N-MeFOSE | 24448-09-7 | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol | X | X | X | | | X |
| N-EtFOSAA | 2991-50-6 | N-ethyl perfluorooctane sulfonamido acetic acid | X | X | X | X | | X |
| N-EtFOSA | 4151-50-2 | N-ethylperfluoro-1-octanesulfonamide | X | X | X | | | X |
| N-EtFOSE | 1691-99-2 | 2-(N-Ethylperfluoro-1-octanesulfonamido)-ethanol | X | X | X | | | X |
| HFPO-DA | 13252-13-6 | Hexafluoropropyleneoxide dimer acid (GenX) | X | X | X | X | X | X |
| 11Cl-PF3OUdS | 763051-92-9 | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid | X | X | X | X | X | X |
| 9Cl-PF3ONS | 756426-58-1 | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid | X | X | X | X | X | X |
| ADONA | 919005-14-4 | 4,8-dioxa-3H-perfluorononanoic acid | X | X | X | X | X | X |
| PFEESA | 113507-82-7 | Perfluoro(2-ethoxyethane)sulfonic acid | | X | X | | X | X |
| PFMOBA (PFMBA) | 863090-89-5 | Perfluoro-4-methoxybutanoic acid | | X | X | | X | X |
| NFDHA | 151772-58-6 | Nonafluoro-3,6-dioxaheptanoic acid | | X | X | | X | X |
| PFMOPrA (PFMPA) | 377-73-1 | Perfluoro-3-methoxypropanoic acid | | X | X | | X | X |
| PFPrA | 422-64-0 | Perfluoropropionic acid, 2,2,3,3,3-Pentafluoropropionic acid | | | X | | | |
| PFPrS (PFPS) | 423-41-6 | Perfluoropropanesulfonic acid | | | X | | | X |

| PFAS Compound Acronym List | | | Methods | | | | | |
|---|---|---|---|---|---|---|---|---|
| Acronym | CAS # | Compound Name | SOP EU047 | EPA 1633 (B-24) | EPA 1633X | EPA 537.1 | EPA 533 | EPA 8327* |
| PFMOAA | 674-13-5 | Perfluoro-2-methoxyacetic acid; | | | X | | | X |
| PFO2HxA | 39492-88-1 | Perfluoro (3,5-dioxahexanoic) acid | | | X | | | X |
| PFO3OA | 39492-89-2 | Perfluoro (3,5,7-trioxaoctanoic) acid | | | X | | | X |
| PFO4DA | 39492-90-5 | Perfluoro (3,5,7,9-tetraoxadecanoic) acid | | | X | | | X |
| PFO5DA | 39492-91-6 | Perfluoro(3,5,7,9,11-pentaoxadodecanoic) acid | | | X | | | X |
| Nafion Byproduct 1 (PS Acid) | 29311-67-9 | 1,1,2,2-tetrafluoro-2-[1,1,1,2,3,3-hexafluoro-3-(1,2,2-trifluoroethenoxy)propan-2-yl]oxyethanesulfonic acid | | | X | | | X |
| Nafion Byproduct 2 (Hydro-PS Acid) | 749836-20-2 | Perfluoro-2-{[perfluoro-3-(perfluoroethoxy)-2-propanyl]oxy}ethanesulfonic acid (Hydro-PS Acid) | | | X | | | X |
| PEPA | 267239-61-2 | Perfluoro-2-ethoxypropanoic acid | | | X | | | X |
| PMPA | 13140-29-9 | Perfluoro-2-methoxypropanoic acid | | | X | | | X |
| PFECA-G, (PFPE-1) | 801212-59-9 | 4-(Heptafluoroisopropoxy)hexafluorobutanoic acid, Perfluoro-4-isopropoxybutanoic acid | | | X | | | X |
| PFHxDA | 67905-19-5 | Perfluorohexadecanoic acid | | | X | | | |
| R-PSDA (Nafion Byproduct 4) | 2416366-18-0 | Perfluoro-4-(2-sulfoethoxy)pentanoic acid; 2,2,3,3,4,5,5,5-Octafluoro-4-(1,1,2,2-tetrafluoro-2-sulfoethoxy)pentanoic acid | | | X | | | X |
| 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 | | | X | | | X |
| 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 | | | X | | | X |
| 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 | | | X | | | X |
| FBSA | 30334-69-1 | Perfluorobutylsulfonamide | | | X | | | X |
| MeFBSA | 68298-12-4 | 1-Butanesulfonamide; (N-(Methyl)nonafluorobutanesulfonamide); 1,1,2,2,3,3,4,4,4-nonafluoro-N-methyl-1-Butanesulfonamide | | | X | | | X |
| 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 | | | X | | | X |
| 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 | | | X | | | X |
| NVHOS | 1132933-86-8 | Perfluoroethoxysulfonic acid; 1,1,2,2-Tetrafluoro-2-(1,2,2,2-tetrafluoroethoxy)ethane-1-sulfonic acid | | | X | | | X |

| PFAS Compound Acronym List | | | Methods | | | | | |
|---|---|---|---|---|---|---|---|---|
| Acronym | CAS # | Compound Name | SOP EU047 | EPA 1633 (B-24) | EPA 1633X | EPA 537.1 | EPA 533 | EPA 8327* |
| PFDoS | 79780-39-5 | Perfluorododecane sulfonic acid | | X | X | | | X |
| PFODA | 16517-11-6 | Perfluorooctadecanoic acid | | | X | | | |
| 3:3 FTCA | 356-02-5 | 2H,2H,3H,3H-Perfluorohexanoic acid | | X | X | | | X |
| 5:3 FTCA | 914637-49-3 | 2H,2H,3H,3H-Perfluorooctanoic acid | | X | X | | | X |
| 7:3 FTCA | 812-70-4 | 2H,2H,3H,3H-Perfluorodecanoic acid | | X | X | | | X |
| N-AP-FHxSA | 50598-28-2 | N-(3-(Dimethylamino)propyl)tridecafluoro-1-hexanesulfonamide | | | X | | | X |
| 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 | | | X | | | X |
| BPAF | 1478-61-1 | Bisphenol AF | | | X | | | X |
| HQ-115 | 90076-65-6 | Bis(trifluoromethane)sulfonimide lithium salt | | | X | | | X |

* Accreditation pending

# Results

# Enthalpy Analytical

Job No.: 0325-1208-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT LELAND N.C.

## Summary

| | Compound | CAS | 032825-SO1 ng/L | 032825-EO1 ng/L |
|---|---|---|---|---|
| Acids | PFPrA | 422-64-0 | 539 L | 516 L |
| | PFBA | 375-22-4 | 2.57 | 2.59 |
| | PFPeA | 2706-90-3 | 3.25 | 3.42 |
| | PFHxA | 307-24-4 | 3.55 | 3.57 |
| | PFHpA | 375-85-9 | 1.76 | 1.71 |
| | PFOA | 335-67-1 | 3.78 | 3.52 |
| | PFNA | 375-95-1 | 0.385 J | 0.422 J |
| | PFDA | 335-76-2 | 0.0139 L | 0.00597 L |
| | PFUnDA | 2058-94-8 | ND U | ND U |
| | 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 | 2.12 | 2.32 |
| | PFPeS | 2706-91-4 | 0.152 J | 0.258 J |
| | PFHxS | 355-46-4 | 2.21 | 2.45 |
| | PFHpS | 375-92-8 | 0.0786 L | 0.0569 L |
| | PFOS | 1763-23-1 | 7.30 | 7.12 |
| | 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 | ND U | ND U |
| | 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 | 0.134 L | 0.143 L |
| | 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 | ND U | 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 | 2.42 | 2.33 |
| | Hydro-EVE Acid | 773804-62-9 | ND U | ND U |
| | NFDHA | 151772-58-6 | ND U | ND U |
| | PEPA | 267239-61-2 | 2.68 | 1.85 |
| | PFECA-G | 801212-59-9 | ND U | ND U |
| | PFMOAA | 674-13-5 | 13.1 | 10.7 |
| | PFMOBA | 863090-89-5 | ND U | ND U |
| | PFMOPrA | 377-73-1 | ND U | ND U |
| | PFO2HxA | 39492-88-1 | 2.02 | 2.15 |
| | PFO3OA | 39492-89-2 | 0.441 J | 0.540 J |
| | PFO4DA | 39492-90-5 | ND U | ND U |
| | PFO5DA | 39492-91-6 | ND U | ND U |
| | PMPA | 13140-29-9 | 5.90 | 6.49 |
| | R-EVE | 2416366-22-6 | 2.57 | 2.16 |
| PFESAs | 11Cl-PF3OUdS | 763051-92-9 | ND U | ND U |
| | 9Cl-PF3ONS | 756426-58-1 | ND U | ND U |
| | Hydrolyzed PSDA | 2416366-19-1 | 0.563 | 0.628 |
| | Nafion Byproduct 1 (PS Acid) | 29311-67-9 | ND U | ND U |
| | Nafion Byproduct 2 (Hydro-PS Acid) | 749836-20-2 | 0.297 L | 0.148 L |
| | NVHOS | 1132933-86-8 | ND U | ND U |
| | PFEESA | 113507-82-7 | ND U | ND U |
| | R-PSDA | 2416366-18-0 | 1.87 L | 1.28 L |
| | R-PSDCA | 2416366-21-5 | ND U | ND U |

# Enthalpy Analytical

Job No.: 0325-1208-1  PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC  NORHWEST WATER PLANT  LELAND N.C.

## Details

| | | | |
|---|---|---|---|
| Sample Name | 032825-SO1 | | |
| Sampling Site | | | |
| Enthalpy ID | 0325-1208-001-2 | Prep Batch | EU19199 |
| Matrix | aqueous | Analyst | zoearndt |
| Sampling Date | 2025-03-28 13:35 | Instrument | Bumblebee |
| Received Date | 2025-03-28 | Sample Vol mL | 0.1 |
| Prep Date | 2025-04-01 11:10 | Extract Vol mL | 0.2 |
| AnalysisDate | 2025-04-01 18:50 | 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 | PFPrA | 422-64-0 | B010425-04011850 | 539 | 700 | 1530 | | | L |
| ES | 13C3-PFPrA | | B010425-04011850 | | | | 20-150% | 94.4% | |

# Enthalpy Analytical

Job No.: 0325-1208-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT LELAND N.C.

## Details

| | | | |
|---|---|---|---|
| Sample Name | 032825-SO1 | | |
| Sampling Site | | | |
| Enthalpy ID | 0325-1208-001-2A | Prep Batch | EU19201 |
| Matrix | aqueous | Analyst | ext-magennaef |
| Sampling Date | 2025-03-28 13:35 | Instrument | Pippin |
| Received Date | 2025-03-28 | Sample Vol mL | 284.18 |
| Prep Date | 2025-04-01 13:27 | Extract Vol mL | 0.4 |
| AnalysisDate | 2025-04-03 06:53 | 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 | P020425030 | 2.57 | 0.223 | 0.563 | | | |
| | PFPeA | 2706-90-3 | P020425030 | 3.25 | 0.161 | 0.563 | | | |
| | PFHxA | 307-24-4 | P020425030 | 3.55 | 0.188 | 0.563 | | | |
| | PFHpA | 375-85-9 | P020425030 | 1.76 | 0.197 | 0.563 | | | |
| | PFOA | 335-67-1 | P020425030 | 3.78 | 0.129 | 0.563 | | | |
| | PFNA | 375-95-1 | P020425030 | 0.385 | 0.127 | 0.563 | | | J |
| | PFDA | 335-76-2 | P020425030 | 0.0139 | 0.161 | 0.563 | | | L |
| | PFUnDA | 2058-94-8 | P020425030 | ND | 0.127 | 0.563 | | | U |
| | PFDoDA | 307-55-1 | P020425030 | ND | 0.229 | 0.563 | | | U |
| | PFTrDA | 72629-94-8 | P020425030 | ND | 0.187 | 0.563 | | | U |
| | PFTeDA | 376-06-7 | P020425030 | ND | 0.215 | 0.563 | | | U |
| | PFHxDA | 67905-19-5 | P020425030 | ND | 0.299 | 0.563 | | | U |
| Sulfonates | PFBS | 375-73-5 | P020425030 | 2.12 | 0.299 | 0.563 | | | |
| | PFPeS | 2706-91-4 | P020425030 | 0.152 | 0.116 | 0.530 | | | J |
| | PFHxS | 355-46-4 | P020425030 | 2.21 | 0.435 | 0.516 | | | |
| | PFHpS | 375-92-8 | P020425030 | 0.0786 | 0.273 | 0.536 | | | L |
| | PFOS | 1763-23-1 | P020425030 | 7.30 | 0.297 | 0.522 | | | |
| | PFNS | 68259-12-1 | P020425030 | ND | 0.175 | 0.542 | | | U |
| | PFDS | 335-77-3 | P020425030 | ND | 0.296 | 0.542 | | | U |
| | 4:2 FTS | 757124-72-4 | P020425030 | ND | 0.0730 | 0.527 | | | U |
| | 6:2 FTS | 27619-97-2 | P020425030 | ND | 0.266 | 0.536 | | | U |
| | 8:2 FTS | 39108-34-4 | P020425030 | ND | 0.126 | 0.539 | | | U |
| | 10:2 FTS | 120226-60-0 | P020425030 | ND | 0.431 | 0.563 | | | U |
| Sulfonamidos | FBSA | 30334-69-1 | P020425030 | 0.134 | 0.267 | 0.563 | | | L |
| | N-EtFOSA | 4151-50-2 | P020425030 | ND | 0.348 | 0.563 | | | U |
| | N-EtFOSAA | 2991-50-6 | P020425030 | ND | 0.229 | 0.563 | | | U |
| | N-EtFOSE | 1691-99-2 | P020425030 | ND | 0.862 | 2.53 | | | U |
| | N-MeFOSA | 31506-32-8 | P020425030 | ND | 0.232 | 0.563 | | | U |
| | N-MeFOSAA | 2355-31-9 | P020425030 | ND | 0.158 | 0.563 | | | U |
| | N-MeFOSE | 24448-09-7 | P020425030 | ND | 0.535 | 2.53 | | | U |
| | PFOSA | 754-91-6 | P020425030 | ND | 0.0790 | 0.563 | | | U |
| PFECAs | ADONA | 919005-14-4 | P020425030 | ND | 0.153 | 0.533 | | | U |
| | EVE Acid | 69087-46-3 | P020425030 | ND | 0.179 | 1.27 | | | U |
| | HFPO-DA | 13252-13-6 | P020425030 | 2.42 | 0.0596 | 0.563 | | | |
| | Hydro-EVE Acid | 773804-62-9 | P020425030 | ND | 0.185 | 0.563 | | | U |
| | NFDHA | 151772-58-6 | P020425030 | ND | 0.118 | 0.563 | | | U |
| | PEPA | 267239-61-2 | P020425030 | 2.68 | 0.106 | 0.563 | | | |
| | PFECA-G | 801212-59-9 | P020425030 | ND | 0.0751 | 0.563 | | | U |
| | PFMOAA | 674-13-5 | P020425030 | 13.1 | 0.285 | 0.563 | | | |
| | PFMOBA | 863090-89-5 | P020425030 | ND | 0.945 | 1.27 | | | U |
| | PFMOPrA | 377-73-1 | P020425030 | ND | 0.201 | 0.563 | | | U |
| | PFO2HxA | 39492-88-1 | P020425030 | 2.02 | 0.181 | 0.563 | | | |
| | PFO3OA | 39492-89-2 | P020425030 | 0.441 | 0.259 | 0.563 | | | J |
| | PFO4DA | 39492-90-5 | P020425030 | ND | 0.445 | 2.82 | | | U |
| | PFO5DA | 39492-91-6 | P020425030 | ND | 0.450 | 2.82 | | | U |
| | PMPA | 13140-29-9 | P020425030 | 5.90 | 0.133 | 0.563 | | | |
| | R-EVE | 2416366-22-6 | P020425030 | 2.57 | 0.934 | 1.27 | | | |
| PFESAs | 11Cl-PF3OUdS | 763051-92-9 | P020425030 | ND | 0.266 | 0.530 | | | U |
| | 9Cl-PF3ONS | 756426-58-1 | P020425030 | ND | 0.361 | 0.525 | | | U |
| | Hydrolyzed PSDA | 2416366-19-1 | P020425030 | 0.563 | 0.375 | 0.563 | | | |
| | Nafion Byproduct 1 (PS Acid) | 29311-67-9 | P020425030 | ND | 0.301 | 0.563 | | | U |
| | Nafion Byproduct 2 (Hydro-PS Acid) | 749836-20-2 | P020425030 | 0.297 | 0.466 | 0.563 | | | L |
| | NVHOS | 1132933-86-8 | P020425030 | ND | 0.0867 | 0.563 | | | U |
| | PFEESA | 113507-82-7 | P020425030 | ND | 0.169 | 0.563 | | | U |
| | R-PSDA | 2416366-18-0 | P020425030 | 1.87 | 2.48 | 2.48 | | | L |
| | R-PSDCA | 2416366-21-5 | P020425030 | ND | 0.238 | 0.563 | | | U |
| ES | MPFBA | | P020425030 | | | | 20-150% | 105% | |
| | M5PFPeA | | P020425030 | | | | 20-150% | 388% | Q |
| | M3PFBS | | P020425030 | | | | 20-150% | 103% | Ac |
| | M2-4:2 FTS | | P020425030 | | | | 20-150% | 246% | Q |
| | M5PFHxA | | P020425030 | | | | 20-150% | 133% | |
| | M3HFPO-DA | | P020425030 | | | | 20-150% | 121% | |
| | M4PFHpA | | P020425030 | | | | 20-150% | 78.3% | |

# Enthalpy Analytical

Job No.: 0325-1208-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORHWEST WATER PLANT LELAND N.C.

## Details

| | | | |
|---|---|---|---|
| Sample Name | 032825-SO1 | | |
| Sampling Site | | | |
| Enthalpy ID | 0325-1208-001-2A | Prep Batch | EU19201 |
| Matrix | aqueous | Analyst | ext-magennaef |
| Sampling Date | 2025-03-28 13:35 | Instrument | Pippin |
| Received Date | 2025-03-28 | Sample Vol mL | 284.18 |
| Prep Date | 2025-04-01 13:27 | Extract Vol mL | 0.4 |
| AnalysisDate | 2025-04-03 06:53 | 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 | | P020425030 | | | | 20-150% | 110% | |
| | M2-6:2 FTS | | P020425030 | | | | 20-150% | 134% | |
| | M8PFOA | | P020425030 | | | | 20-150% | 102% | |
| | M9PFNA | | P020425030 | | | | 20-150% | 77.9% | |
| | M8PFOS | | P020425030 | | | | 20-150% | 81.3% | |
| | M2-8:2 FTS | | P020425030 | | | | 20-150% | 77.5% | |
| | M8FOSA-I | | P020425030 | | | | 20-150% | 53.0% | |
| | M6PFDA | | P020425030 | | | | 20-150% | 86.1% | |
| | d3-N-MeFOSAA | | P020425030 | | | | 20-150% | 96.4% | |
| | d5-N-EtFOSAA | | P020425030 | | | | 20-150% | 97.1% | |
| | M7PFUdA | | P020425030 | | | | 20-150% | 96.9% | |
| | MPFDoA | | P020425030 | | | | 20-150% | 75.1% | |
| | M2PFTeDA | | P020425030 | | | | 20-150% | 19.0% | Q |
| | d3-N-MeFOSA | | P020425030 | | | | 10-200% | 3.58% | Q |
| | d5-N-EtFOSA | | P020425030 | | | | 10-200% | 3.44% | Q |
| | d7-N-MeFOSE | | P020425030 | | | | 10-200% | 26.8% | |
| | d9-N-EtFOSE | | P020425030 | | | | 10-200% | 18.9% | |

# Enthalpy Analytical

Job No.: 0325-1208-1  PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC  NORHWEST WATER PLANT  LELAND N.C.

## Details

| | | | |
|---|---|---|---|
| Sample Name | 032825-EO1 | | |
| Sampling Site | | | |
| Enthalpy ID | 0325-1208-002-2 | Prep Batch | EU19199 |
| Matrix | aqueous | Analyst | zoearndt |
| Sampling Date | 2025-03-28 13:35 | Instrument | Bumblebee |
| Received Date | 2025-03-28 | Sample Vol mL | 0.1 |
| Prep Date | 2025-04-01 11:10 | Extract Vol mL | 0.2 |
| AnalysisDate | 2025-04-01 19:01 | 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 | PFPrA | 422-64-0 | B010425-04011901 | 516 | 700 | 1530 | | | L |
| ES | 13C3-PFPrA | | B010425-04011901 | | | | 20-150% | 80.8% | |

# Enthalpy Analytical

Job No.: 0325-1208-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT LELAND N.C.

## Details

| | | | |
|---|---|---|---|
| Sample Name | 032825-EO1 | | |
| Sampling Site | | | |
| Enthalpy ID | 0325-1208-002-2A | Prep Batch | EU19201 |
| Matrix | aqueous | Analyst | ext-magennaef |
| Sampling Date | 2025-03-28 13:35 | Instrument | Pippin |
| Received Date | 2025-03-28 | Sample Vol mL | 287.71 |
| Prep Date | 2025-04-01 13:27 | Extract Vol mL | 0.4 |
| AnalysisDate | 2025-04-03 07:39 | 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 | P020425032 | 2.59 | 0.221 | 0.556 | | | |
| | PFPeA | 2706-90-3 | P020425032 | 3.42 | 0.159 | 0.556 | | | |
| | PFHxA | 307-24-4 | P020425032 | 3.57 | 0.186 | 0.556 | | | |
| | PFHpA | 375-85-9 | P020425032 | 1.71 | 0.195 | 0.556 | | | |
| | PFOA | 335-67-1 | P020425032 | 3.52 | 0.127 | 0.556 | | | |
| | PFNA | 375-95-1 | P020425032 | 0.422 | 0.126 | 0.556 | | | J |
| | PFDA | 335-76-2 | P020425032 | 0.00597 | 0.159 | 0.556 | | | L |
| | PFUnDA | 2058-94-8 | P020425032 | ND | 0.126 | 0.556 | | | U |
| | PFDoDA | 307-55-1 | P020425032 | ND | 0.226 | 0.556 | | | U |
| | PFTrDA | 72629-94-8 | P020425032 | ND | 0.184 | 0.556 | | | U |
| | PFTeDA | 376-06-7 | P020425032 | ND | 0.212 | 0.556 | | | U |
| | PFHxDA | 67905-19-5 | P020425032 | ND | 0.295 | 0.556 | | | U |
| Sulfonates | PFBS | 375-73-5 | P020425032 | 2.32 | 0.295 | 0.556 | | | |
| | PFPeS | 2706-91-4 | P020425032 | 0.258 | 0.114 | 0.524 | | | J |
| | PFHxS | 355-46-4 | P020425032 | 2.45 | 0.429 | 0.509 | | | |
| | PFHpS | 375-92-8 | P020425032 | 0.0569 | 0.269 | 0.530 | | | L |
| | PFOS | 1763-23-1 | P020425032 | 7.12 | 0.294 | 0.515 | | | |
| | PFNS | 68259-12-1 | P020425032 | ND | 0.173 | 0.536 | | | U |
| | PFDS | 335-77-3 | P020425032 | ND | 0.292 | 0.536 | | | U |
| | 4:2 FTS | 757124-72-4 | P020425032 | ND | 0.0721 | 0.521 | | | U |
| | 6:2 FTS | 27619-97-2 | P020425032 | ND | 0.262 | 0.530 | | | U |
| | 8:2 FTS | 39108-34-4 | P020425032 | ND | 0.125 | 0.533 | | | U |
| | 10:2 FTS | 120226-60-0 | P020425032 | ND | 0.426 | 0.556 | | | U |
| Sulfonamidos | FBSA | 30334-69-1 | P020425032 | 0.143 | 0.264 | 0.556 | | | L |
| | N-EtFOSA | 4151-50-2 | P020425032 | ND | 0.344 | 0.556 | | | U |
| | N-EtFOSAA | 2991-50-6 | P020425032 | ND | 0.226 | 0.556 | | | U |
| | N-EtFOSE | 1691-99-2 | P020425032 | ND | 0.852 | 2.50 | | | U |
| | N-MeFOSA | 31506-32-8 | P020425032 | ND | 0.229 | 0.556 | | | U |
| | N-MeFOSAA | 2355-31-9 | P020425032 | ND | 0.156 | 0.556 | | | U |
| | N-MeFOSE | 24448-09-7 | P020425032 | ND | 0.528 | 2.50 | | | U |
| | PFOSA | 754-91-6 | P020425032 | ND | 0.0780 | 0.556 | | | U |
| PFECAs | ADONA | 919005-14-4 | P020425032 | ND | 0.151 | 0.527 | | | U |
| | EVE Acid | 69087-46-3 | P020425032 | ND | 0.177 | 1.25 | | | U |
| | HFPO-DA | 13252-13-6 | P020425032 | 2.33 | 0.0589 | 0.556 | | | |
| | Hydro-EVE Acid | 773804-62-9 | P020425032 | ND | 0.182 | 0.556 | | | U |
| | NFDHA | 151772-58-6 | P020425032 | ND | 0.117 | 0.556 | | | U |
| | PEPA | 267239-61-2 | P020425032 | 1.85 | 0.104 | 0.556 | | | |
| | PFECA-G | 801212-59-9 | P020425032 | ND | 0.0742 | 0.556 | | | U |
| | PFMOAA | 674-13-5 | P020425032 | 10.7 | 0.282 | 0.556 | | | |
| | PFMOBA | 863090-89-5 | P020425032 | ND | 0.933 | 1.25 | | | U |
| | PFMOPrA | 377-73-1 | P020425032 | ND | 0.198 | 0.556 | | | U |
| | PFO2HxA | 39492-88-1 | P020425032 | 2.15 | 0.179 | 0.556 | | | |
| | PFO3OA | 39492-89-2 | P020425032 | 0.540 | 0.255 | 0.556 | | | J |
| | PFO4DA | 39492-90-5 | P020425032 | ND | 0.440 | 2.78 | | | U |
| | PFO5DA | 39492-91-6 | P020425032 | ND | 0.445 | 2.78 | | | U |
| | PMPA | 13140-29-9 | P020425032 | 6.49 | 0.131 | 0.556 | | | |
| | R-EVE | 2416366-22-6 | P020425032 | 2.16 | 0.923 | 1.25 | | | |
| PFESAs | 11Cl-PF3OUdS | 763051-92-9 | P020425032 | ND | 0.262 | 0.524 | | | U |
| | 9Cl-PF3ONS | 756426-58-1 | P020425032 | ND | 0.356 | 0.518 | | | U |
| | Hydrolyzed PSDA | 2416366-19-1 | P020425032 | 0.628 | 0.370 | 0.556 | | | |
| | Nafion Byproduct 1 (PS Acid) | 29311-67-9 | P020425032 | ND | 0.297 | 0.556 | | | U |
| | Nafion Byproduct 2 (Hydro-PS Acid) | 749836-20-2 | P020425032 | 0.148 | 0.461 | 0.556 | | | L |
| | NVHOS | 1132933-86-8 | P020425032 | ND | 0.0857 | 0.556 | | | U |
| | PFEESA | 113507-82-7 | P020425032 | ND | 0.167 | 0.556 | | | U |
| | R-PSDA | 2416366-18-0 | P020425032 | 1.28 | 2.45 | 2.45 | | | L |
| | R-PSDCA | 2416366-21-5 | P020425032 | ND | 0.235 | 0.556 | | | U |
| ES | MPFBA | | P020425032 | | | | 20-150% | 111% | |
| | M5PFPeA | | P020425032 | | | | 20-150% | 308% | Q |
| | M3PFBS | | P020425032 | | | | 20-150% | 79.5% | Ac |
| | M2-4:2 FTS | | P020425032 | | | | 20-150% | 251% | Q |
| | M5PFHxA | | P020425032 | | | | 20-150% | 142% | |
| | M3HFPO-DA | | P020425032 | | | | 20-150% | 128% | |
| | M4PFHpA | | P020425032 | | | | 20-150% | 79.8% | |

# Enthalpy Analytical

Job No.: 0325-1208-1  PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC  NORHWEST WATER PLANT  LELAND N.C.

## Details

| | | | |
|---|---|---|---|
| Sample Name | 032825-EO1 | | |
| Sampling Site | | | |
| Enthalpy ID | 0325-1208-002-2A | Prep Batch | EU19201 |
| Matrix | aqueous | Analyst | ext-magennaef |
| Sampling Date | 2025-03-28 13:35 | Instrument | Pippin |
| Received Date | 2025-03-28 | Sample Vol mL | 287.71 |
| Prep Date | 2025-04-01 13:27 | Extract Vol mL | 0.4 |
| AnalysisDate | 2025-04-03 07:39 | 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 | | P020425032 | | | | 20-150% | 114% | |
| | M2-6:2 FTS | | P020425032 | | | | 20-150% | 149% | |
| | M8PFOA | | P020425032 | | | | 20-150% | 115% | |
| | M9PFNA | | P020425032 | | | | 20-150% | 99.9% | |
| | M8PFOS | | P020425032 | | | | 20-150% | 110% | |
| | M2-8:2 FTS | | P020425032 | | | | 20-150% | 113% | |
| | M8FOSA-I | | P020425032 | | | | 20-150% | 86.0% | |
| | M6PFDA | | P020425032 | | | | 20-150% | 121% | |
| | d3-N-MeFOSAA | | P020425032 | | | | 20-150% | 133% | |
| | d5-N-EtFOSAA | | P020425032 | | | | 20-150% | 144% | |
| | M7PFUdA | | P020425032 | | | | 20-150% | 136% | |
| | MPFDoA | | P020425032 | | | | 20-150% | 120% | |
| | M2PFTeDA | | P020425032 | | | | 20-150% | 56.1% | |
| | d3-N-MeFOSA | | P020425032 | | | | 10-200% | 10.5% | |
| | d5-N-EtFOSA | | P020425032 | | | | 10-200% | 11.1% | |
| | d7-N-MeFOSE | | P020425032 | | | | 10-200% | 62.3% | |
| | d9-N-EtFOSE | | P020425032 | | | | 10-200% | 48.1% | |

# QC Data

ENTHALPY ANALYTICAL

# Enthalpy Analytical

Job No.: 0325-1208-1  PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC  NORHWEST WATER PLANT  LELAND N.C.

## Details

| | | | |
|---|---|---|---|
| Sample Name | MB_19199_PFAS | | |
| Sampling Site | | | |
| Enthalpy ID | MB_19199_PFAS | Prep Batch | EU19199 |
| Matrix | aqueous | Analyst | zoearndt |
| Sampling Date | | Instrument | Bumblebee |
| Received Date | | Sample Vol mL | 0.1 |
| Prep Date | 2025-04-01 11:10 | Extract Vol mL | 0.2 |
| AnalysisDate | 2025-04-01 17:28 | 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 | B010425-04011728 | 522 | 700 | 1530 | | | L |
| ES | 13C3-PFPrA | | B010425-04011728 | | | | 20-150% | 97.7% | |

# Enthalpy Analytical

Job No.: 0325-1208-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORTHWEST WATER PLANT LELAND N.C.

## Details

| | | | |
|---|---|---|---|
| Sample Name | MB_19201_PFAS | | |
| Sampling Site | | | |
| Enthalpy ID | MB_19201_PFAS | Prep Batch | EU19201 |
| Matrix | aqueous | Analyst | ext-magennaef |
| Sampling Date | | Instrument | Pippin |
| Received Date | | Sample Vol mL | 250 |
| Prep Date | 2025-04-01 13:27 | Extract Vol mL | 0.4 |
| AnalysisDate | 2025-04-03 02:43 | 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 | P020425019 | ND | 0.254 | 0.640 | | | U |
| | PFPeA | 2706-90-3 | P020425019 | ND | 0.183 | 0.640 | | | U |
| | PFHxA | 307-24-4 | P020425019 | ND | 0.214 | 0.640 | | | U |
| | PFHpA | 375-85-9 | P020425019 | ND | 0.224 | 0.640 | | | U |
| | PFOA | 335-67-1 | P020425019 | ND | 0.146 | 0.640 | | | U |
| | PFNA | 375-95-1 | P020425019 | ND | 0.145 | 0.640 | | | U |
| | PFDA | 335-76-2 | P020425019 | ND | 0.183 | 0.640 | | | U |
| | PFUnDA | 2058-94-8 | P020425019 | ND | 0.145 | 0.640 | | | U |
| | PFDoDA | 307-55-1 | P020425019 | ND | 0.260 | 0.640 | | | U |
| | PFTrDA | 72629-94-8 | P020425019 | ND | 0.212 | 0.640 | | | U |
| | PFTeDA | 376-06-7 | P020425019 | ND | 0.244 | 0.640 | | | U |
| | PFHxDA | 67905-19-5 | P020425019 | ND | 0.340 | 0.640 | | | U |
| Sulfonates | PFBS | 375-73-5 | P020425019 | ND | 0.340 | 0.640 | | | U |
| | PFPeS | 2706-91-4 | P020425019 | ND | 0.131 | 0.603 | | | U |
| | PFHxS | 355-46-4 | P020425019 | ND | 0.494 | 0.586 | | | U |
| | PFHpS | 375-92-8 | P020425019 | ND | 0.310 | 0.610 | | | U |
| | PFOS | 1763-23-1 | P020425019 | ND | 0.338 | 0.593 | | | U |
| | PFNS | 68259-12-1 | P020425019 | ND | 0.199 | 0.616 | | | U |
| | PFDS | 335-77-3 | P020425019 | ND | 0.336 | 0.616 | | | U |
| | 4:2 FTS | 757124-72-4 | P020425019 | ND | 0.0830 | 0.600 | | | U |
| | 6:2 FTS | 27619-97-2 | P020425019 | ND | 0.302 | 0.610 | | | U |
| | 8:2 FTS | 39108-34-4 | P020425019 | ND | 0.143 | 0.613 | | | U |
| | 10:2 FTS | 120226-60-0 | P020425019 | ND | 0.490 | 0.640 | | | U |
| Sulfonamidos | FBSA | 30334-69-1 | P020425019 | ND | 0.304 | 0.640 | | | U |
| | N-EtFOSA | 4151-50-2 | P020425019 | 1.34 | 0.396 | 0.640 | | | |
| | N-EtFOSAA | 2991-50-6 | P020425019 | ND | 0.260 | 0.640 | | | U |
| | N-EtFOSE | 1691-99-2 | P020425019 | ND | 0.980 | 2.88 | | | U |
| | N-MeFOSA | 31506-32-8 | P020425019 | ND | 0.264 | 0.640 | | | U |
| | N-MeFOSAA | 2355-31-9 | P020425019 | ND | 0.180 | 0.640 | | | U |
| | N-MeFOSE | 24448-09-7 | P020425019 | ND | 0.608 | 2.88 | | | U |
| | PFOSA | 754-91-6 | P020425019 | ND | 0.0898 | 0.640 | | | U |
| PFECAs | ADONA | 919005-14-4 | P020425019 | ND | 0.173 | 0.606 | | | U |
| | EVE Acid | 69087-46-3 | P020425019 | ND | 0.204 | 1.44 | | | U |
| | HFPO-DA | 13252-13-6 | P020425019 | ND | 0.0678 | 0.640 | | | U |
| | Hydro-EVE Acid | 773804-62-9 | P020425019 | ND | 0.210 | 0.640 | | | U |
| | NFDHA | 151772-58-6 | P020425019 | ND | 0.135 | 0.640 | | | U |
| | PEPA | 267239-61-2 | P020425019 | ND | 0.120 | 0.640 | | | U |
| | PFECA-G | 801212-59-9 | P020425019 | ND | 0.0854 | 0.640 | | | U |
| | PFMOAA | 674-13-5 | P020425019 | ND | 0.324 | 0.640 | | | U |
| | PFMOBA | 863090-89-5 | P020425019 | ND | 1.07 | 1.44 | | | U |
| | PFMOPrA | 377-73-1 | P020425019 | ND | 0.228 | 0.640 | | | U |
| | PFO2HxA | 39492-88-1 | P020425019 | ND | 0.206 | 0.640 | | | U |
| | PFO3OA | 39492-89-2 | P020425019 | ND | 0.294 | 0.640 | | | U |
| | PFO4DA | 39492-90-5 | P020425019 | ND | 0.506 | 3.20 | | | U |
| | PFO5DA | 39492-91-6 | P020425019 | ND | 0.512 | 3.20 | | | U |
| | PMPA | 13140-29-9 | P020425019 | ND | 0.151 | 0.640 | | | U |
| | R-EVE | 2416366-22-6 | P020425019 | ND | 1.06 | 1.44 | | | U |
| PFESAs | 11Cl-PF3OUdS | 763051-92-9 | P020425019 | ND | 0.302 | 0.603 | | | U |
| | 9Cl-PF3ONS | 756426-58-1 | P020425019 | ND | 0.410 | 0.596 | | | U |
| | Hydrolyzed PSDA | 2416366-19-1 | P020425019 | ND | 0.426 | 0.640 | | | U |
| | Nafion Byproduct 1 (PS Acid) | 29311-67-9 | P020425019 | ND | 0.342 | 0.640 | | | U |
| | Nafion Byproduct 2 (Hydro-PS Acid) | 749836-20-2 | P020425019 | ND | 0.530 | 0.640 | | | U |
| | NVHOS | 1132933-86-8 | P020425019 | ND | 0.0986 | 0.640 | | | U |
| | PFEESA | 113507-82-7 | P020425019 | ND | 0.192 | 0.640 | | | U |
| | R-PSDA | 2416366-18-0 | P020425019 | ND | 2.82 | 2.82 | | | U |
| | R-PSDCA | 2416366-21-5 | P020425019 | ND | 0.270 | 0.640 | | | U |
| ES | MPFBA | | P020425019 | | | | 20-150% | 117% | |
| | M5PFPeA | | P020425019 | | | | 20-150% | 139% | |
| | M3PFBS | | P020425019 | | | | 20-150% | 136% | |
| | M2-4:2 FTS | | P020425019 | | | | 20-150% | 139% | |
| | M5PFHxA | | P020425019 | | | | 20-150% | 114% | |
| | M3HFPO-DA | | P020425019 | | | | 20-150% | 108% | |
| | M4PFHpA | | P020425019 | | | | 20-150% | 105% | |

# Enthalpy Analytical

Job No.: 0325-1208-1  PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC  NORHWEST WATER PLANT  LELAND N.C.

## Details

| | | | |
|---|---|---|---|
| Sample Name | MB_19201_PFAS | | |
| Sampling Site | | | |
| Enthalpy ID | MB_19201_PFAS | Prep Batch | EU19201 |
| Matrix | aqueous | Analyst | ext-magennaef |
| Sampling Date | | Instrument | Pippin |
| Received Date | | Sample Vol mL | 250 |
| Prep Date | 2025-04-01 13:27 | Extract Vol mL | 0.4 |
| AnalysisDate | 2025-04-03 02:43 | 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 | | P020425019 | | | | 20-150% | 114% | |
| | M2-6:2 FTS | | P020425019 | | | | 20-150% | 128% | |
| | M8PFOA | | P020425019 | | | | 20-150% | 115% | |
| | M9PFNA | | P020425019 | | | | 20-150% | 105% | |
| | M8PFOS | | P020425019 | | | | 20-150% | 110% | |
| | M2-8:2 FTS | | P020425019 | | | | 20-150% | 103% | |
| | M8FOSA-I | | P020425019 | | | | 20-150% | 46.2% | |
| | M6PFDA | | P020425019 | | | | 20-150% | 115% | |
| | d3-N-MeFOSAA | | P020425019 | | | | 20-150% | 107% | |
| | d5-N-EtFOSAA | | P020425019 | | | | 20-150% | 104% | |
| | M7PFUdA | | P020425019 | | | | 20-150% | 111% | |
| | MPFDoA | | P020425019 | | | | 20-150% | 82.8% | |
| | M2PFTeDA | | P020425019 | | | | 20-150% | 13.6% | Q |
| | d3-N-MeFOSA | | P020425019 | | | | 10-200% | 0.264% | Q |
| | d5-N-EtFOSA | | P020425019 | | | | 10-200% | 0.246% | Q |
| | d7-N-MeFOSE | | P020425019 | | | | 10-200% | 22.1% | |
| | d9-N-EtFOSE | | P020425019 | | | | 10-200% | 17.6% | |

## Enthalpy Analytical

Job No.: 0325-1208-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORHWEST WATER PLANT LELAND N.C.

| | | | | | |
|---|---|---|---|---|---|
| Enthalpy ID | OPR_19199_PFAS | Prep Batch | EU19199 | Sample Vol (mL) | 0.08 |
| Sample Name | OPR_19199_PFAS | Prep Date | 2025-04-01 11:10 | Extract Vol (mL) | 0.2 |
| Matrix | aqueous | Analysis Date | 2025-04-01 17:40 | Split Factor | N/A |
| Sampling Date | | Analyst | zoearndt | Method Code | EU-047-NPW |
| Received Date | | Instrument | Bumblebee | Sample Type | Control |
| | | Bottle ID | - | | |

| | Compound | CAS | InjFileName | Sample Concentration ng/L | LOD ng/L | LOQ ng/L | Recovery Limits | Recovery | Flags |
|---|---|---|---|---|---|---|---|---|---|
| Acids | PFPrA | 422-64-0 | B010425-04011740 | 24300 | 875 | 1910 | 40-150% | 97.2% | |
| ES | 13C3-PFPrA | | B010425-04011740 | | | | 20-150% | 89.2% | |

## Enthalpy Analytical

Job No.: 0325-1208-1 PFAS by Isotope Dilution (non-potable water)

Brunswick County Public Utilities - NC NORHWEST WATER PLANT LELAND N.C.

| | | | | | |
|---|---|---|---|---|---|
| Enthalpy ID | OPR_19201_PFAS | Prep Batch | EU19201 | Sample Vol (mL) | 250 |
| Sample Name | OPR_19201_PFAS | Prep Date | 2025-04-01 13:27 | Extract Vol (mL) | 0.4 |
| Matrix | aqueous | Analysis Date | 2025-04-03 03:06 | Split Factor | N/A |
| Sampling Date | | Analyst | ext-magennaef | 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 | P020425020 | 20.6 | 0.254 | 0.640 | 47.9-144% | 103% | |
| | PFPeA | 2706-90-3 | P020425020 | 18.3 | 0.183 | 0.640 | 41.7-159% | 91.4% | |
| | PFHxA | 307-24-4 | P020425020 | 19.5 | 0.214 | 0.640 | 43.2-154% | 97.4% | |
| | PFHpA | 375-85-9 | P020425020 | 18.3 | 0.224 | 0.640 | 42.1-155% | 91.3% | |
| | PFOA | 335-67-1 | P020425020 | 18.7 | 0.146 | 0.640 | 51.1-148% | 93.5% | |
| | PFNA | 375-95-1 | P020425020 | 18.9 | 0.145 | 0.640 | 51.6-153% | 94.3% | |
| | PFDA | 335-76-2 | P020425020 | 19.0 | 0.183 | 0.640 | 44.5-156% | 95.0% | |
| | PFUnDA | 2058-94-8 | P020425020 | 18.6 | 0.145 | 0.640 | 40.3-156% | 93.1% | |
| | PFDoDA | 307-55-1 | P020425020 | 18.7 | 0.260 | 0.640 | 40.4-158% | 93.4% | |
| | PFTrDA | 72629-94-8 | P020425020 | 39.6 | 0.212 | 0.640 | 42.2-201% | 198% | |
| | PFTeDA | 376-06-7 | P020425020 | 19.9 | 0.244 | 0.640 | 43-162% | 99.3% | |
| Sulfonates | PFBS | 375-73-5 | P020425020 | 17.1 | 0.340 | 0.640 | 42.7-155% | 96.7% | |
| | PFPeS | 2706-91-4 | P020425020 | 15.6 | 0.131 | 0.603 | 40.3-152% | 82.7% | |
| | PFHxS | 355-46-4 | P020425020 | 17.2 | 0.494 | 0.586 | 45-148% | 94.3% | |
| | PFHpS | 375-92-8 | P020425020 | 20.3 | 0.310 | 0.610 | 39.8-166% | 107% | |
| | PFOS | 1763-23-1 | P020425020 | 17.5 | 0.338 | 0.593 | 59.2-132% | 94.3% | |
| | PFNS | 68259-12-1 | P020425020 | 19.8 | 0.199 | 0.616 | 38.1-153% | 103% | |
| | PFDS | 335-77-3 | P020425020 | 18.6 | 0.336 | 0.616 | 28.6-148% | 96.2% | |
| | 4:2 FTS | 757124-72-4 | P020425020 | 18.6 | 0.0830 | 0.600 | 41.5-157% | 99.1% | |
| | 6:2 FTS | 27619-97-2 | P020425020 | 18.7 | 0.302 | 0.610 | 44.5-160% | 98.3% | |
| | 8:2 FTS | 39108-34-4 | P020425020 | 17.9 | 0.143 | 0.613 | 39.4-166% | 93.0% | |
| Sulfonamidos | N-EtFOSA | 4151-50-2 | P020425020 | 21.6 | 0.396 | 0.640 | 26.7-172% | 108% | |
| | N-EtFOSAA | 2991-50-6 | P020425020 | 19.1 | 0.260 | 0.640 | 42.8-156% | 95.7% | |
| | N-EtFOSE | 1691-99-2 | P020425020 | 101 | 0.980 | 2.88 | 38.9-161% | 112% | |
| | N-MeFOSA | 31506-32-8 | P020425020 | 35.1 | 0.264 | 0.640 | 26.4-183% | 176% | |
| | N-MeFOSAA | 2355-31-9 | P020425020 | 19.6 | 0.180 | 0.640 | 42-155% | 97.8% | |
| | N-MeFOSE | 24448-09-7 | P020425020 | 97.4 | 0.608 | 2.88 | 37.6-155% | 108% | |
| | PFOSA | 754-91-6 | P020425020 | 16.5 | 0.0898 | 0.640 | 39.1-158% | 82.6% | |
| PFECAs | ADONA | 919005-14-4 | P020425020 | 16.4 | 0.173 | 0.606 | 32.2-151% | 82.1% | |
| | HFPO-DA | 13252-13-6 | P020425020 | 20.4 | 0.0678 | 0.640 | 61.8-131% | 102% | |
| PFESAs | 11Cl-PF3OUdS | 763051-92-9 | P020425020 | 18.0 | 0.302 | 0.603 | 21.8-141% | 90.2% | |
| | 9Cl-PF3ONS | 756426-58-1 | P020425020 | 18.7 | 0.410 | 0.596 | 37.6-146% | 93.4% | |
| ES | MPFBA | | P020425020 | | | | 20-150% | 110% | |
| | M5PFPeA | | P020425020 | | | | 20-150% | 134% | |
| | M3PFBS | | P020425020 | | | | 20-150% | 133% | |
| | M2-4:2 FTS | | P020425020 | | | | 20-150% | 152% | Q |
| | M5PFHxA | | P020425020 | | | | 20-150% | 122% | |
| | M3HFPO-DA | | P020425020 | | | | 20-150% | 117% | |
| | M4PFHpA | | P020425020 | | | | 20-150% | 103% | |
| | M3PFHxS | | P020425020 | | | | 20-150% | 125% | |
| | M2-6:2 FTS | | P020425020 | | | | 20-150% | 144% | |
| | M8PFOA | | P020425020 | | | | 20-150% | 118% | |
| | M9PFNA | | P020425020 | | | | 20-150% | 107% | |
| | M8PFOS | | P020425020 | | | | 20-150% | 116% | |
| | M2-8:2 FTS | | P020425020 | | | | 20-150% | 121% | |
| | M8FOSA-I | | P020425020 | | | | 20-150% | 61.5% | |
| | M6PFDA | | P020425020 | | | | 20-150% | 116% | |
| | d3-N-MeFOSAA | | P020425020 | | | | 20-150% | 121% | |
| | d5-N-EtFOSAA | | P020425020 | | | | 20-150% | 120% | |
| | M7PFUdA | | P020425020 | | | | 20-150% | 119% | |
| | MPFDoA | | P020425020 | | | | 20-150% | 109% | |
| | M2PFTeDA | | P020425020 | | | | 20-150% | 44.0% | |
| | d3-N-MeFOSA | | P020425020 | | | | 10-200% | 0.239% | Q |
| | d5-N-EtFOSA | | P020425020 | | | | 10-200% | 0.344% | Q |
| | d7-N-MeFOSE | | P020425020 | | | | 10-200% | 38.1% | |
| | d9-N-EtFOSE | | P020425020 | | | | 10-200% | 30.6% | |

# Sample Custody

ENTHALPY analytical

0325-1208

# 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 CindyJames@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 PCB | PFAS by LC/MS/MS | PAHs by HRGC/HRMS | Sample on Hold | Method 23 | ALL PFAS | Notes: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 032825-SO1 | 3/28/2025 | 1335PM | 250 ml | G | NW | 2 | | | | | | | | | | | X | Please Add PFPrA and |
| 032825-EO1 | 3/28/2025 | 1335PM | 250 ml | G | DW | 2 | | | | | | | | | | | X | PFHpA To The Testing. |
| | | | | | | | | | | | | | | | | | | Mark Hager Knows About |
| | | | | | | | | | | | | | | | | | | This If you Have Questions |
| | | | | | | | | | | | | | | | | | | |
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| Relinquished By: | Date: | Received By: | Date: | Time: | Sample Temperature Upon Receipt |
|---|---|---|---|---|---|
| BILLY BENTON | 3/28/2025 | | 3/28/25 | 14:44 | ☑ Iced ☐ Ambient °C 6.2 |
| | | | | | ☐ Iced ☐ Ambient °C_____ |
| | | | | | ☐ Iced ☐ Ambient °C_____ |

2714 Exchange Drive • Wilmington, NC 28405 • (910) 212-5858 • www.enthalpy.com

JOB ID: 0325-1208 Date / Time: 3/28/25 14:44 Initials: S.S.

OR

Client: Brunswick County Public Utilities

Cooler 1 of 1

Temp °C: 6.2 Thermometer ID: 75

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

| Check one | |
|---|---|
| On ice: | ☑ |
| Melted ice: | ☐ |
| Ambient: | ☐ |

| Check one | |
|---|---|
| in a Box: | ☐ |
| in a Cooler: | ☑ |
| Cooler in Box: | ☐ |

| | Yes | No |
|---|---|---|
| Cooler seals: | ☐ | ☑ |
| Sample seals: | ☐ | ☑ |
| Good condition: | ☑ | ☐ |

Comment:

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Cooler ____ of ____

Temp °C: ____ Thermometer ID: ____

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

| Check one | |
|---|---|
| On ice: | ☐ |
| Melted ice: | ☐ |
| Ambient: | ☐ |

| Check one | |
|---|---|
| in a Box: | ☐ |
| in a Cooler: | ☐ |
| Cooler in Box: | ☐ |

| | Yes | No |
|---|---|---|
| Cooler seals: | ☐ | ☐ |
| Sample seals: | ☐ | ☐ |
| Good condition: | ☐ | ☐ |

Comment:

---

Cooler ____ of ____

Temp °C: ____ Thermometer ID: ____

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

| Check one | |
|---|---|
| On ice: | ☐ |
| Melted ice: | ☐ |
| Ambient: | ☐ |

| Check one | |
|---|---|
| in a Box: | ☐ |
| in a Cooler: | ☐ |
| Cooler in Box: | ☐ |

| | Yes | No |
|---|---|---|
| Cooler seals: | ☐ | ☐ |
| Sample seals: | ☐ | ☐ |
| Good condition: | ☐ | ☐ |

Comment: