

ANALYTICAL REPORT

PREPARED FOR

Attn: Ms. Lauren Dolginko
Roux Environmental Eng & Geology DPC
209 Shafter St
Islandia, New York 11749

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JOB DESCRIPTION

2828 W 28th Street

JOB NUMBER

460-311274-1

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Job Notes

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Authorization



Authorized for release by
Elizabeth Flannery, Project Manager I
Elizabeth.Flannery@et.eurofinsus.com
(732)549-3900

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Definitions/Glossary

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*	MS or MSD is outside acceptance limits.
J	Indicates an estimated value.
U	Analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Roux Environmental Eng & Geology DPC
Project: 2828 W 28th Street

Job ID: 460-311274-1

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Job Narrative 460-311274-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt

The samples were received on 9/12/2024 7:00 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 1.6°C.

Method 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Samples RXMW-6_P (460-311274-1) and FB_09122024_P (460-311274-2) were analyzed for Per- and Polyfluoroalkyl Substances by LC/MS/MS. The samples were prepared on 9/16/2024 and analyzed on 9/17/2024.

The low level continuing calibration verification (CCVL) and continuing calibration verification (CCV) associated with batch 240-627188 recovered outside of control limits for IDA compound(s) (flagged). Section 14.3.3 of the finalized EPA 1633 states that the recovery of target analytes for the CCV(s) must be within 70 - 130%, unless the analyte is not of concern for a given project. Since target analyte(s) associated with this IDA are within spec, data is reported.

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Detection Summary

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Client Sample ID: RXMW-6_P

Lab Sample ID: 460-311274-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	13.7		6.19	1.65	ng/L	1		1633	Total/NA
Perfluoropentanoic acid (PFPeA)	9.57		3.09	0.77	ng/L	1		1633	Total/NA
Perfluorohexanoic acid (PFHxA)	10.6		1.55	0.39	ng/L	1		1633	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.78		1.55	0.39	ng/L	1		1633	Total/NA
Perfluorooctanoic acid (PFOA)	20.8		1.55	0.39	ng/L	1		1633	Total/NA
Perfluorononanoic acid (PFNA)	2.94		1.55	0.39	ng/L	1		1633	Total/NA
Perfluorodecanoic acid (PFDA)	0.85	J	1.55	0.39	ng/L	1		1633	Total/NA
Perfluorobutanesulfonic acid (PFBS)	2.28		1.55	0.39	ng/L	1		1633	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.53	J	1.55	0.40	ng/L	1		1633	Total/NA
Perfluorooctanesulfonic acid (PFOS)	15.3		1.55	0.39	ng/L	1		1633	Total/NA
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	4.29	J	6.19	1.55	ng/L	1		1633	Total/NA

Client Sample ID: FB_09122024_P

Lab Sample ID: 460-311274-2

No Detections.

This Detection Summary does not include radiochemical test results.

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Client Sample Results

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Client Sample ID: RXMW-6_P

Lab Sample ID: 460-311274-1

Date Collected: 09/12/24 12:45

Matrix: Water

Date Received: 09/12/24 19:00

Method: EPA 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	13.7		6.19	1.65	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluoropentanoic acid (PFPeA)	9.57		3.09	0.77	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluorohexanoic acid (PFHxA)	10.6		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluoroheptanoic acid (PFHpA)	5.78		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluorooctanoic acid (PFOA)	20.8		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluorononanoic acid (PFNA)	2.94		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluorodecanoic acid (PFDA)	0.85 J		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluoroundecanoic acid (PFUnA)	1.55 U		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluorododecanoic acid (PFDoA)	1.55 U		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluorotridecanoic acid (PFTrDA)	1.55 U		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluorotetradecanoic acid (PFTeDA)	1.55 U		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluorobutanesulfonic acid (PFBS)	2.28		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluoropentanesulfonic acid (PFPeS)	1.55 U		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluorohexanesulfonic acid (PFHxS)	1.53 J		1.55	0.40	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluoroheptanesulfonic acid (PFHpS)	1.55 U		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluorooctanesulfonic acid (PFOS)	15.3		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluorononanesulfonic acid (PFNS)	1.55 U		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluorododecanesulfonic acid (PFDoS)	1.55 U		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	6.19 U		6.19	1.55	ng/L		09/16/24 08:32	09/17/24 00:00	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	6.19 U		6.19	1.55	ng/L		09/16/24 08:32	09/17/24 00:00	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	6.19 U		6.19	1.55	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluorooctanesulfonamide (PFOSA)	1.55 U		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	1.55 U		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	1.55 U		1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	1.55 U		1.55	0.48	ng/L		09/16/24 08:32	09/17/24 00:00	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	1.55 U		1.55	0.40	ng/L		09/16/24 08:32	09/17/24 00:00	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	15.5 U		15.5	3.87	ng/L		09/16/24 08:32	09/17/24 00:00	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	15.5 U		15.5	3.87	ng/L		09/16/24 08:32	09/17/24 00:00	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	4.29 J		6.19	1.55	ng/L		09/16/24 08:32	09/17/24 00:00	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	6.19 U		6.19	1.55	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	3.09 U		3.09	0.77	ng/L		09/16/24 08:32	09/17/24 00:00	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	3.09 U		3.09	0.94	ng/L		09/16/24 08:32	09/17/24 00:00	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	6.19 U		6.19	1.55	ng/L		09/16/24 08:32	09/17/24 00:00	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	6.19 U		6.19	1.55	ng/L		09/16/24 08:32	09/17/24 00:00	1

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Client Sample Results

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Client Sample ID: RXMW-6_P

Lab Sample ID: 460-311274-1

Date Collected: 09/12/24 12:45

Matrix: Water

Date Received: 09/12/24 19:00

Method: EPA 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	3.09	U	3.09	0.77	ng/L		09/16/24 08:32	09/17/24 00:00	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	7.74	U	7.74	1.93	ng/L		09/16/24 08:32	09/17/24 00:00	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	38.7	U	38.7	9.67	ng/L		09/16/24 08:32	09/17/24 00:00	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	38.7	U	38.7	11.5	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluorodecanesulfonic acid (PFDS)	1.55	U	1.55	0.39	ng/L		09/16/24 08:32	09/17/24 00:00	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	3.09	U	3.09	0.77	ng/L		09/16/24 08:32	09/17/24 00:00	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	86.6		10 - 130				09/16/24 08:32	09/17/24 00:00	1
13C5 PFPeA	79.1		35 - 150				09/16/24 08:32	09/17/24 00:00	1
13C5 PFHxA	70.7		55 - 150				09/16/24 08:32	09/17/24 00:00	1
13C4 PFHpA	80.3		55 - 150				09/16/24 08:32	09/17/24 00:00	1
13C8 PFOA	83.5		60 - 140				09/16/24 08:32	09/17/24 00:00	1
13C9 PFNA	100		55 - 140				09/16/24 08:32	09/17/24 00:00	1
13C6 PFDA	97.8		50 - 140				09/16/24 08:32	09/17/24 00:00	1
13C7 PFUnA	81.4		30 - 140				09/16/24 08:32	09/17/24 00:00	1
13C2 PFTeDA	55.7		10 - 130				09/16/24 08:32	09/17/24 00:00	1
13C3 PFBS	99.9		55 - 150				09/16/24 08:32	09/17/24 00:00	1
13C3 PFHxS	94.5		55 - 150				09/16/24 08:32	09/17/24 00:00	1
13C8 PFOS	89.5		45 - 140				09/16/24 08:32	09/17/24 00:00	1
13C8 FOSA	84.6		30 - 130				09/16/24 08:32	09/17/24 00:00	1
d3-NMeFOSAA	79.0		45 - 200				09/16/24 08:32	09/17/24 00:00	1
d5-NEtFOSAA	83.9		10 - 200				09/16/24 08:32	09/17/24 00:00	1
M2-4:2 FTS	128		60 - 200				09/16/24 08:32	09/17/24 00:00	1
M2-6:2 FTS	127		60 - 200				09/16/24 08:32	09/17/24 00:00	1
M2-8:2 FTS	121		50 - 200				09/16/24 08:32	09/17/24 00:00	1
13C3 HFPO-DA	75.9		25 - 160				09/16/24 08:32	09/17/24 00:00	1
d7-N-MeFOSE-M	80.7		10 - 150				09/16/24 08:32	09/17/24 00:00	1
d9-N-EtFOSE-M	69.5		10 - 150				09/16/24 08:32	09/17/24 00:00	1
d5-NEtPFOSA	61.5		10 - 130				09/16/24 08:32	09/17/24 00:00	1
d3-NMePFOSA	63.4		15 - 130				09/16/24 08:32	09/17/24 00:00	1
13C2-PFDoDA	75.8		10 - 150				09/16/24 08:32	09/17/24 00:00	1

Client Sample ID: FB_09122024_P

Lab Sample ID: 460-311274-2

Date Collected: 09/12/24 13:55

Matrix: Water

Date Received: 09/12/24 19:00

Method: EPA 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	6.35	U	6.35	1.69	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluoropentanoic acid (PFPeA)	3.17	U	3.17	0.79	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluorohexanoic acid (PFHxA)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluoroheptanoic acid (PFHpA)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluorooctanoic acid (PFOA)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluorononanoic acid (PFNA)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluorodecanoic acid (PFDA)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluoroundecanoic acid (PFUnA)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1

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Client Sample Results

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Client Sample ID: FB_09122024_P

Lab Sample ID: 460-311274-2

Date Collected: 09/12/24 13:55

Matrix: Water

Date Received: 09/12/24 19:00

Method: EPA 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorododecanoic acid (PFDoA)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluorotridecanoic acid (PFTriDA)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluorotetradecanoic acid (PFTeDA)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluorobutanesulfonic acid (PFBS)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluoropentanesulfonic acid (PFPeS)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluorohexanesulfonic acid (PFHxS)	1.59	U	1.59	0.41	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluoroheptanesulfonic acid (PFHpS)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluorooctanesulfonic acid (PFOS)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluorononanesulfonic acid (PFNS)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluorododecanesulfonic acid (PFDoS)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	6.35	U	6.35	1.59	ng/L		09/16/24 08:32	09/17/24 00:13	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	6.35	U	6.35	1.59	ng/L		09/16/24 08:32	09/17/24 00:13	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	6.35	U	6.35	1.59	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluorooctanesulfonamide (PFOSA)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	1.59	U	1.59	0.49	ng/L		09/16/24 08:32	09/17/24 00:13	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	1.59	U	1.59	0.41	ng/L		09/16/24 08:32	09/17/24 00:13	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	15.9	U	15.9	3.97	ng/L		09/16/24 08:32	09/17/24 00:13	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	15.9	U	15.9	3.97	ng/L		09/16/24 08:32	09/17/24 00:13	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	6.35	U	6.35	1.59	ng/L		09/16/24 08:32	09/17/24 00:13	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	6.35	U	6.35	1.59	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	3.17	U	3.17	0.79	ng/L		09/16/24 08:32	09/17/24 00:13	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	3.17	U	3.17	0.97	ng/L		09/16/24 08:32	09/17/24 00:13	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	6.35	U	6.35	1.59	ng/L		09/16/24 08:32	09/17/24 00:13	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	6.35	U	6.35	1.59	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	3.17	U	3.17	0.79	ng/L		09/16/24 08:32	09/17/24 00:13	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	7.94	U	7.94	1.98	ng/L		09/16/24 08:32	09/17/24 00:13	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	39.7	U	39.7	9.92	ng/L		09/16/24 08:32	09/17/24 00:13	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	39.7	U	39.7	11.8	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluorodecanesulfonic acid (PFDS)	1.59	U	1.59	0.40	ng/L		09/16/24 08:32	09/17/24 00:13	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	3.17	U	3.17	0.79	ng/L		09/16/24 08:32	09/17/24 00:13	1

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Client Sample Results

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Client Sample ID: FB_09122024_P

Lab Sample ID: 460-311274-2

Date Collected: 09/12/24 13:55

Matrix: Water

Date Received: 09/12/24 19:00

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	88.0		10 - 130	09/16/24 08:32	09/17/24 00:13	1
13C5 PFPeA	78.6		35 - 150	09/16/24 08:32	09/17/24 00:13	1
13C5 PFHxA	75.6		55 - 150	09/16/24 08:32	09/17/24 00:13	1
13C4 PFHpA	78.3		55 - 150	09/16/24 08:32	09/17/24 00:13	1
13C8 PFOA	86.0		60 - 140	09/16/24 08:32	09/17/24 00:13	1
13C9 PFNA	88.1		55 - 140	09/16/24 08:32	09/17/24 00:13	1
13C6 PFDA	99.6		50 - 140	09/16/24 08:32	09/17/24 00:13	1
13C7 PFUnA	96.2		30 - 140	09/16/24 08:32	09/17/24 00:13	1
13C2 PFTeDA	70.4		10 - 130	09/16/24 08:32	09/17/24 00:13	1
13C3 PFBS	101		55 - 150	09/16/24 08:32	09/17/24 00:13	1
13C3 PFHxS	95.9		55 - 150	09/16/24 08:32	09/17/24 00:13	1
13C8 PFOS	98.9		45 - 140	09/16/24 08:32	09/17/24 00:13	1
13C8 FOSA	92.3		30 - 130	09/16/24 08:32	09/17/24 00:13	1
d3-NMeFOSAA	98.4		45 - 200	09/16/24 08:32	09/17/24 00:13	1
d5-NEtFOSAA	102		10 - 200	09/16/24 08:32	09/17/24 00:13	1
M2-4:2 FTS	138		60 - 200	09/16/24 08:32	09/17/24 00:13	1
M2-6:2 FTS	121		60 - 200	09/16/24 08:32	09/17/24 00:13	1
M2-8:2 FTS	125		50 - 200	09/16/24 08:32	09/17/24 00:13	1
13C3 HFPO-DA	78.6		25 - 160	09/16/24 08:32	09/17/24 00:13	1
d7-N-MeFOSE-M	89.4		10 - 150	09/16/24 08:32	09/17/24 00:13	1
d9-N-EtFOSE-M	86.5		10 - 150	09/16/24 08:32	09/17/24 00:13	1
d5-NEtPFOSA	66.3		10 - 130	09/16/24 08:32	09/17/24 00:13	1
d3-NMePFOSA	69.6		15 - 130	09/16/24 08:32	09/17/24 00:13	1
13C2-PFDoDA	97.4		10 - 150	09/16/24 08:32	09/17/24 00:13	1

Isotope Dilution Summary

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Matrix: Water

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFBA (10-130)	PFPeA (35-150)	13C5PHA (55-150)	C4PFHA (55-150)	C8PFOA (60-140)	C9PFNA (55-140)	C6PFDA (50-140)	13C7PUA (30-140)
460-311274-1	RXMW-6_P	86.6	79.1	70.7	80.3	83.5	100	97.8	81.4
460-311274-2	FB_09122024_P	88.0	78.6	75.6	78.3	86.0	88.1	99.6	96.2
480-223347-A-1-C MS	Matrix Spike	90.6	57.1	63.1	83.4	65.7	109	110	86.6
480-223347-B-1-B MSD	Matrix Spike Duplicate	90.7	60.9	67.6	89.3	66.7	107	105	77.5
480-223347-D-3-A DU	Duplicate	89.5	61.4	68.5	88.4	69.3	124	104	101
MB 240-627062/1-A	Method Blank	87.1	74.2	73.8	76.9	81.9	97.4	106	97.0

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFTDA (10-130)	C3PFBS (55-150)	C3PFHS (55-150)	C8PFOS (45-140)	PFOSA (30-130)	d3NMFOS (45-200)	d5NEFOS (10-200)	M242FTS (60-200)
460-311274-1	RXMW-6_P	55.7	99.9	94.5	89.5	84.6	79.0	83.9	128
460-311274-2	FB_09122024_P	70.4	101	95.9	98.9	92.3	98.4	102	138
480-223347-A-1-C MS	Matrix Spike	57.7	96.7	98.8	97.4	93.3	64.7	76.9	89.5
480-223347-B-1-B MSD	Matrix Spike Duplicate	46.4	92.3	97.3	98.6	95.6	63.2	78.2	86.8
480-223347-D-3-A DU	Duplicate	72.9	95.1	87.1	91.3	99.8	67.4	84.4	90.5
MB 240-627062/1-A	Method Blank	68.8	98.7	96.4	96.4	91.8	96.4	101	130

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	M262FTS (60-200)	M282FTS (50-200)	HFPODA (25-160)	NMFM (10-150)	NEFM (10-150)	d5NPFSA (10-130)	d3NMFSA (15-130)	PFDODA (10-150)
460-311274-1	RXMW-6_P	127	121	75.9	80.7	69.5	61.5	63.4	75.8
460-311274-2	FB_09122024_P	121	125	78.6	89.4	86.5	66.3	69.6	97.4
480-223347-A-1-C MS	Matrix Spike	104	110	77.0	69.7	62.6	52.4	57.6	71.0
480-223347-B-1-B MSD	Matrix Spike Duplicate	104	102	78.1	71.3	61.1	51.2	59.2	59.8
480-223347-D-3-A DU	Duplicate	97.7	111	79.2	72.1	74.7	66.0	67.1	83.0
MB 240-627062/1-A	Method Blank	127	118	75.4	86.7	76.3	64.9	67.0	90.0

Surrogate Legend

PFBA = 13C4 PFBA
PFPeA = 13C5 PFPeA
13C5PHA = 13C5 PFHxA
C4PFHA = 13C4 PFHpA
C8PFOA = 13C8 PFOA
C9PFNA = 13C9 PFNA
C6PFDA = 13C6 PFDA
13C7PUA = 13C7 PFUnA
PFTDA = 13C2 PFTeDA
C3PFBS = 13C3 PFBS
C3PFHS = 13C3 PFHxS
C8PFOS = 13C8 PFOS
PFOSA = 13C8 FOSA
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
M242FTS = M2-4:2 FTS
M262FTS = M2-6:2 FTS
M282FTS = M2-8:2 FTS
HFPODA = 13C3 HFPO-DA
NMFM = d7-N-MeFOSE-M
NEFM = d9-N-EtFOSE-M
d5NPFSA = d5-NEtPFOSA
d3NMFSA = d3-NMePFOSA

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Isotope Dilution Summary

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street
PFDODA = 13C2-PFDODA

Job ID: 460-311274-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Matrix: Water

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFBA (10-130)	PFPeA (40-150)	13C5PHA (40-150)	C4PFHA (40-150)	C8PFOA (30-140)	C9PFNA (30-140)	C6PFDA (20-140)	13C7PUA (20-140)
LCS 240-627062/3-A	Lab Control Sample	82.3	73.2	71.3	76.2	85.7	87.4	90.9	102
LLCS 240-627062/2-A	Lab Control Sample	84.3	73.7	73.0	72.0	79.1	89.0	103	90.3

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFTDA (10-130)	C3PFBS (25-150)	C3PFHS (25-150)	C8PFOS (20-140)	PFOSA (10-130)	d3NMFOS (10-200)	d5NEFOS (10-200)	M242FTS (25-200)
LCS 240-627062/3-A	Lab Control Sample	76.7	90.6	89.2	88.3	82.0	82.0	92.5	127
LLCS 240-627062/2-A	Lab Control Sample	67.5	97.8	91.6	90.6	86.2	89.2	91.8	135

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	M262FTS (25-200)	M282FTS (25-200)	HFPODA (25-160)	NMFM (10-150)	NEFM (10-150)	d5NPFSA (10-130)	d3NMFSA (10-130)	PFDODA (10-150)
LCS 240-627062/3-A	Lab Control Sample	117	115	72.8	73.6	75.3	59.8	60.9	86.1
LLCS 240-627062/2-A	Lab Control Sample	122	113	74.1	78.3	79.3	60.8	65.9	95.7

Surrogate Legend

PFBA = 13C4 PFBA
PFPeA = 13C5 PFPeA
13C5PHA = 13C5 PFHxA
C4PFHA = 13C4 PFHpA
C8PFOA = 13C8 PFOA
C9PFNA = 13C9 PFNA
C6PFDA = 13C6 PFDA
13C7PUA = 13C7 PFUnA
PFTDA = 13C2 PFTeDA
C3PFBS = 13C3 PFBS
C3PFHS = 13C3 PFHxS
C8PFOS = 13C8 PFOS
PFOSA = 13C8 FOSA
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
M242FTS = M2-4:2 FTS
M262FTS = M2-6:2 FTS
M282FTS = M2-8:2 FTS
HFPODA = 13C3 HFPO-DA
NMFM = d7-N-MeFOSE-M
NEFM = d9-N-EtFOSE-M
d5NPFSA = d5-NEtPFOSA
d3NMFSA = d3-NMePFOSA
PFDODA = 13C2-PFDODA

QC Sample Results

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Lab Sample ID: MB 240-627062/1-A

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 627062

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	8.00	U	8.00	2.13	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluoropentanoic acid (PFPeA)	4.00	U	4.00	1.00	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluorohexanoic acid (PFHxA)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluoroheptanoic acid (PFHpA)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluorooctanoic acid (PFOA)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluorononanoic acid (PFNA)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluorodecanoic acid (PFDA)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluoroundecanoic acid (PFUnA)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluorododecanoic acid (PFDoA)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluorotridecanoic acid (PFTriDA)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluorotetradecanoic acid (PFTeDA)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluorobutanesulfonic acid (PFBS)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluoropentanesulfonic acid (PFPeS)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluorohexanesulfonic acid (PFHxS)	2.00	U	2.00	0.52	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluoroheptanesulfonic acid (PFHpS)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluorooctanesulfonic acid (PFOS)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluorononanesulfonic acid (PFNS)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluorododecanesulfonic acid (PFDoS)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	8.00	U	8.00	2.00	ng/L		09/16/24 08:32	09/16/24 21:17	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	8.00	U	8.00	2.00	ng/L		09/16/24 08:32	09/16/24 21:17	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	8.00	U	8.00	2.00	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluorooctanesulfonamide (PFOSA)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	U	2.00	0.62	ng/L		09/16/24 08:32	09/16/24 21:17	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	U	2.00	0.52	ng/L		09/16/24 08:32	09/16/24 21:17	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	20.0	U	20.0	5.00	ng/L		09/16/24 08:32	09/16/24 21:17	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	20.0	U	20.0	5.00	ng/L		09/16/24 08:32	09/16/24 21:17	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	8.00	U	8.00	2.00	ng/L		09/16/24 08:32	09/16/24 21:17	1
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	8.00	U	8.00	2.00	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	4.00	U	4.00	1.00	ng/L		09/16/24 08:32	09/16/24 21:17	1
Nonafluoro-3,6-dioxahexanoic acid (NFDHA)	4.00	U	4.00	1.22	ng/L		09/16/24 08:32	09/16/24 21:17	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	8.00	U	8.00	2.00	ng/L		09/16/24 08:32	09/16/24 21:17	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	8.00	U	8.00	2.00	ng/L		09/16/24 08:32	09/16/24 21:17	1

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QC Sample Results

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: MB 240-627062/1-A

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 627062

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro (2-ethoxyethane) sulfonic acid (PFESA)	4.00	U	4.00	1.00	ng/L		09/16/24 08:32	09/16/24 21:17	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	10.0	U	10.0	2.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	50.0	U	50.0	12.5	ng/L		09/16/24 08:32	09/16/24 21:17	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	50.0	U	50.0	14.9	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluorodecanesulfonic acid (PFDS)	2.00	U	2.00	0.50	ng/L		09/16/24 08:32	09/16/24 21:17	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	4.00	U	4.00	1.00	ng/L		09/16/24 08:32	09/16/24 21:17	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	87.1		10 - 130	09/16/24 08:32	09/16/24 21:17	1
13C5 PFPeA	74.2		35 - 150	09/16/24 08:32	09/16/24 21:17	1
13C5 PFHxA	73.8		55 - 150	09/16/24 08:32	09/16/24 21:17	1
13C4 PFHpA	76.9		55 - 150	09/16/24 08:32	09/16/24 21:17	1
13C8 PFOA	81.9		60 - 140	09/16/24 08:32	09/16/24 21:17	1
13C9 PFNA	97.4		55 - 140	09/16/24 08:32	09/16/24 21:17	1
13C6 PFDA	106		50 - 140	09/16/24 08:32	09/16/24 21:17	1
13C7 PFUnA	97.0		30 - 140	09/16/24 08:32	09/16/24 21:17	1
13C2 PFTeDA	68.8		10 - 130	09/16/24 08:32	09/16/24 21:17	1
13C3 PFBS	98.7		55 - 150	09/16/24 08:32	09/16/24 21:17	1
13C3 PFHxS	96.4		55 - 150	09/16/24 08:32	09/16/24 21:17	1
13C8 PFOS	96.4		45 - 140	09/16/24 08:32	09/16/24 21:17	1
13C8 FOSA	91.8		30 - 130	09/16/24 08:32	09/16/24 21:17	1
d3-NMeFOSAA	96.4		45 - 200	09/16/24 08:32	09/16/24 21:17	1
d5-NEtFOSAA	101		10 - 200	09/16/24 08:32	09/16/24 21:17	1
M2-4:2 FTS	130		60 - 200	09/16/24 08:32	09/16/24 21:17	1
M2-6:2 FTS	127		60 - 200	09/16/24 08:32	09/16/24 21:17	1
M2-8:2 FTS	118		50 - 200	09/16/24 08:32	09/16/24 21:17	1
13C3 HFPO-DA	75.4		25 - 160	09/16/24 08:32	09/16/24 21:17	1
d7-N-MeFOSE-M	86.7		10 - 150	09/16/24 08:32	09/16/24 21:17	1
d9-N-EtFOSE-M	76.3		10 - 150	09/16/24 08:32	09/16/24 21:17	1
d5-NEtPFOSA	64.9		10 - 130	09/16/24 08:32	09/16/24 21:17	1
d3-NMePFOSA	67.0		15 - 130	09/16/24 08:32	09/16/24 21:17	1
13C2-PFDoDA	90.0		10 - 150	09/16/24 08:32	09/16/24 21:17	1

Lab Sample ID: LCS 240-627062/3-A

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 627062

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorobutanoic acid (PFBA)	100	97.72		ng/L		98	58 - 148
Perfluoropentanoic acid (PFPeA)	50.0	51.55		ng/L		103	54 - 152
Perfluorohexanoic acid (PFHxA)	25.0	27.61		ng/L		110	55 - 152
Perfluoroheptanoic acid (PFHpA)	25.0	24.83		ng/L		99	54 - 154
Perfluorooctanoic acid (PFOA)	25.0	27.03		ng/L		108	52 - 161
Perfluorononanoic acid (PFNA)	25.0	25.23		ng/L		101	59 - 149
Perfluorodecanoic acid (PFDA)	25.0	27.25		ng/L		109	52 - 147

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QC Sample Results

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LCS 240-627062/3-A

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 627062

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoroundecanoic acid (PFUnA)	25.0	20.21		ng/L		81	48 - 159
Perfluorododecanoic acid (PFDoA)	25.0	24.44		ng/L		98	64 - 142
Perfluorotridecanoic acid (PFTrDA)	25.0	21.55		ng/L		86	49 - 148
Perfluorotetradecanoic acid (PFTeDA)	25.0	24.19		ng/L		97	47 - 161
Perfluorobutanesulfonic acid (PFBS)	22.1	22.42		ng/L		101	62 - 144
Perfluoropentanesulfonic acid (PFPeS)	23.5	25.26		ng/L		108	59 - 151
Perfluorohexanesulfonic acid (PFHxS)	22.8	24.70		ng/L		109	57 - 146
Perfluoroheptanesulfonic acid (PFHpS)	23.8	23.17		ng/L		97	55 - 152
Perfluorooctanesulfonic acid (PFOS)	23.2	22.10		ng/L		95	58 - 149
Perfluorononanesulfonic acid (PFNS)	24.0	22.56		ng/L		94	52 - 148
Perfluorododecanesulfonic acid (PFDoS)	24.2	19.11		ng/L		79	36 - 145
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	93.4	84.09		ng/L		90	67 - 146
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	94.8	86.81		ng/L		92	61 - 151
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	95.8	87.77		ng/L		92	63 - 152
Perfluorooctanesulfonamide (PFOSA)	25.0	26.72		ng/L		107	61 - 148
N-methylperfluorooctane sulfonamide (NMeFOSA)	25.0	29.53		ng/L		118	63 - 145
N-ethylperfluorooctane sulfonamide (NEtFOSA)	25.0	27.75		ng/L		111	65 - 139
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	25.0	26.33		ng/L		105	58 - 144
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	25.0	22.77		ng/L		91	59 - 146
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	250	257.3		ng/L		103	71 - 136
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	250	257.6		ng/L		103	69 - 137
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	100	91.92		ng/L		92	63 - 144
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	94.2	100.8		ng/L		107	68 - 146
Perfluoro-4-methoxybutanoic acid (PFMBA)	50.0	49.26		ng/L		99	55 - 148
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	50.0	54.90		ng/L		110	48 - 161
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	93.2	90.75		ng/L		97	56 - 156
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	94.2	87.88		ng/L		93	46 - 156
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	44.5	47.84		ng/L		108	56 - 151

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QC Sample Results

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LCS 240-627062/3-A

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 627062

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
3-Perfluoropropylpropanoic acid (3:3 FTCA)	125	111.2		ng/L		89	62 - 129
3-Perfluoropentylpropanoic acid (5:3 FTCA)	625	480.4		ng/L		77	63 - 134
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	625	550.4		ng/L		88	50 - 138
Perfluorodecanesulfonic acid (PFDS)	24.1	22.87		ng/L		95	51 - 147
Perfluoro-3-methoxypropanoic acid (PFMPA)	50.0	48.09		ng/L		96	51 - 145

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFBA	82.3		10 - 130
13C5 PFPeA	73.2		40 - 150
13C5 PFHxA	71.3		40 - 150
13C4 PFHpA	76.2		40 - 150
13C8 PFOA	85.7		30 - 140
13C9 PFNA	87.4		30 - 140
13C6 PFDA	90.9		20 - 140
13C7 PFUnA	102		20 - 140
13C2 PFTeDA	76.7		10 - 130
13C3 PFBS	90.6		25 - 150
13C3 PFHxS	89.2		25 - 150
13C8 PFOS	88.3		20 - 140
13C8 FOSA	82.0		10 - 130
d3-NMeFOSAA	82.0		10 - 200
d5-NEtFOSAA	92.5		10 - 200
M2-4:2 FTS	127		25 - 200
M2-6:2 FTS	117		25 - 200
M2-8:2 FTS	115		25 - 200
13C3 HFPO-DA	72.8		25 - 160
d7-N-MeFOSE-M	73.6		10 - 150
d9-N-EtFOSE-M	75.3		10 - 150
d5-NEtPFOSA	59.8		10 - 130
d3-NMePFOSA	60.9		10 - 130
13C2-PFDoDA	86.1		10 - 150

Lab Sample ID: LLCS 240-627062/2-A

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 627062

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorobutanoic acid (PFBA)	8.00	8.229		ng/L		103	44 - 157
Perfluoropentanoic acid (PFPeA)	4.00	4.402		ng/L		110	57 - 148
Perfluorohexanoic acid (PFHxA)	2.00	2.202		ng/L		110	62 - 149
Perfluoroheptanoic acid (PFHpA)	2.00	2.314		ng/L		116	56 - 150
Perfluorooctanoic acid (PFOA)	2.00	2.420		ng/L		121	57 - 161
Perfluorononanoic acid (PFNA)	2.00	2.123		ng/L		106	53 - 157
Perfluorodecanoic acid (PFDA)	2.00	2.171		ng/L		109	43 - 158

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QC Sample Results

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LLCS 240-627062/2-A

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 627062

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoroundecanoic acid (PFUnA)	2.00	2.052		ng/L		103	50 - 155
Perfluorododecanoic acid (PFDoA)	2.00	1.960	J	ng/L		98	60 - 141
Perfluorotridecanoic acid (PFTrDA)	2.00	1.911	J	ng/L		96	52 - 140
Perfluorotetradecanoic acid (PFTeDA)	2.00	2.411		ng/L		121	52 - 156
Perfluorobutanesulfonic acid (PFBS)	1.77	1.818	J	ng/L		103	63 - 145
Perfluoropentanesulfonic acid (PFPeS)	1.88	2.217		ng/L		118	58 - 144
Perfluorohexanesulfonic acid (PFHxS)	1.82	2.311		ng/L		127	44 - 158
Perfluoroheptanesulfonic acid (PFHpS)	1.90	2.100		ng/L		110	51 - 150
Perfluorooctanesulfonic acid (PFOS)	1.86	1.829	J	ng/L		99	43 - 162
Perfluorononanesulfonic acid (PFNS)	1.92	2.044		ng/L		106	46 - 151
Perfluorododecanesulfonic acid (PFDoS)	1.94	1.487	J	ng/L		77	30 - 138
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	7.47	7.213	J	ng/L		97	52 - 158
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	7.58	7.513	J	ng/L		99	48 - 158
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	7.66	7.645	J	ng/L		100	46 - 165
Perfluorooctanesulfonamide (PFOSA)	2.00	2.302		ng/L		115	47 - 163
N-methylperfluorooctane sulfonamide (NMeFOSA)	2.00	2.403		ng/L		120	54 - 155
N-ethylperfluorooctane sulfonamide (NEtFOSA)	2.00	2.378		ng/L		119	49 - 156
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	2.235		ng/L		112	32 - 160
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	1.996	J	ng/L		100	51 - 154
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	20.0	19.57	J	ng/L		98	56 - 151
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	20.0	19.84	J	ng/L		99	60 - 147
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	8.00	8.257		ng/L		103	58 - 154
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.54	8.568		ng/L		114	61 - 148
Perfluoro-4-methoxybutanoic acid (PFMBA)	4.00	4.080		ng/L		102	49 - 154
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	4.00	4.175		ng/L		104	47 - 160
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	7.46	7.595	J	ng/L		102	44 - 167
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	7.54	7.173	J	ng/L		95	36 - 158
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	3.56	3.999	J	ng/L		112	56 - 144

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QC Sample Results

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LLCS 240-627062/2-A

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 627062

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
3-Perfluoropropylpropanoic acid (3:3 FTCA)	10.0	9.388	J	ng/L		94	32 - 161
3-Perfluoropentylpropanoic acid (5:3 FTCA)	50.0	41.42	J	ng/L		83	39 - 156
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	50.0	43.07	J	ng/L		86	36 - 149
Perfluorodecanesulfonic acid (PFDS)	1.93	1.849	J	ng/L		96	50 - 144
Perfluoro-3-methoxypropanoic acid (PFMPA)	4.00	4.185		ng/L		105	48 - 150

Isotope Dilution	LLCS %Recovery	LLCS Qualifier	Limits
13C4 PFBA	84.3		10 - 130
13C5 PFPeA	73.7		40 - 150
13C5 PFHxA	73.0		40 - 150
13C4 PFHpA	72.0		40 - 150
13C8 PFOA	79.1		30 - 140
13C9 PFNA	89.0		30 - 140
13C6 PFDA	103		20 - 140
13C7 PFUnA	90.3		20 - 140
13C2 PFTeDA	67.5		10 - 130
13C3 PFBS	97.8		25 - 150
13C3 PFHxS	91.6		25 - 150
13C8 PFOS	90.6		20 - 140
13C8 FOSA	86.2		10 - 130
d3-NMeFOSAA	89.2		10 - 200
d5-NEtFOSAA	91.8		10 - 200
M2-4:2 FTS	135		25 - 200
M2-6:2 FTS	122		25 - 200
M2-8:2 FTS	113		25 - 200
13C3 HFPO-DA	74.1		25 - 160
d7-N-MeFOSE-M	78.3		10 - 150
d9-N-EtFOSE-M	79.3		10 - 150
d5-NEtPFOSA	60.8		10 - 130
d3-NMePFOSA	65.9		10 - 130
13C2-PFDoDA	95.7		10 - 150

Lab Sample ID: 480-223347-A-1-C MS

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Batch: 627062

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorobutanoic acid (PFBA)	8.36	U	101	101.4		ng/L		101	58 - 148
Perfluoropentanoic acid (PFPeA)	28.8		50.3	80.43		ng/L		103	54 - 152
Perfluorohexanoic acid (PFHxA)	23.4		25.2	57.24		ng/L		135	55 - 152
Perfluoroheptanoic acid (PFHpA)	24.6		25.2	47.77		ng/L		92	54 - 154
Perfluorooctanoic acid (PFOA)	471		25.2	485.7		ng/L		57	52 - 161
Perfluorononanoic acid (PFNA)	52.4		25.2	78.07		ng/L		102	59 - 149
Perfluorodecanoic acid (PFDA)	2.07	J	25.2	24.86		ng/L		91	52 - 147

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QC Sample Results

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: 480-223347-A-1-C MS

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Batch: 627062

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoroundecanoic acid (PFUnA)	1.65	J	25.2	23.73		ng/L		88	48 - 159
Perfluorododecanoic acid (PFDoA)	2.09	U	25.2	24.92		ng/L		99	64 - 142
Perfluorotridecanoic acid (PFTrDA)	0.86	J	25.2	19.25		ng/L		73	49 - 148
Perfluorotetradecanoic acid (PFTeDA)	2.09	U	25.2	23.27		ng/L		93	47 - 161
Perfluorobutanesulfonic acid (PFBS)	10.4		22.2	33.10		ng/L		102	62 - 144
Perfluoropentanesulfonic acid (PFPeS)	2.09	U	23.6	26.10		ng/L		111	59 - 151
Perfluorohexanesulfonic acid (PFHxS)	6.76		22.9	33.43		ng/L		116	57 - 146
Perfluoroheptanesulfonic acid (PFHpS)	0.52	J	24.0	24.60		ng/L		103	55 - 152
Perfluorooctanesulfonic acid (PFOS)	13.3		23.3	35.85		ng/L		96	58 - 149
Perfluorononanesulfonic acid (PFNS)	2.09	U	24.2	19.83		ng/L		82	52 - 148
Perfluorododecanesulfonic acid (PFDoS)	2.09	U	24.4	12.56		ng/L		52	36 - 145
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	8.36	U	94.0	93.07		ng/L		99	67 - 146
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	3.33	J	95.4	94.45		ng/L		96	61 - 151
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	5.99	J	96.4	96.50		ng/L		94	63 - 152
Perfluorooctanesulfonamide (PFOSA)	0.57	J	25.2	28.36		ng/L		110	61 - 148
N-methylperfluorooctane sulfonamide (NMeFOSA)	2.09	U	25.2	28.46		ng/L		113	63 - 145
N-ethylperfluorooctane sulfonamide (NEtFOSA)	2.09	U	25.2	28.03		ng/L		111	65 - 139
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.09	U	25.2	27.81		ng/L		111	58 - 144
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.09	U	25.2	22.62		ng/L		90	59 - 146
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	20.9	U	252	266.4		ng/L		106	71 - 136
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	20.9	U	252	238.7		ng/L		95	69 - 137
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	8.36	U	101	99.87		ng/L		99	63 - 144
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.36	U	94.8	140.7	*	ng/L		148	68 - 146
Perfluoro-4-methoxybutanoic acid (PFMBA)	4.18	U	50.3	61.85		ng/L		123	55 - 148
Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)	4.18	U	50.3	43.38		ng/L		86	48 - 161
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	8.36	U	93.8	111.9		ng/L		119	56 - 156
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	8.36	U	94.8	77.87		ng/L		82	46 - 156
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	4.18	U	44.8	66.29		ng/L		148	56 - 151

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QC Sample Results

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: 480-223347-A-1-C MS

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Batch: 627062

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
3-Perfluoropropylpropanoic acid (3:3 FTCA)	10.5	U	126	153.2		ng/L		122	62 - 129
3-Perfluoropentylpropanoic acid (5:3 FTCA)	52.3	U	629	727.3		ng/L		116	63 - 134
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	52.3	U	629	988.1	*	ng/L		157	50 - 138
Perfluorodecanesulfonic acid (PFDS)	2.09	U	24.3	15.92		ng/L		66	51 - 147
Perfluoro-3-methoxypropanoic acid (PFMPA)	4.18	U	50.3	51.18		ng/L		102	51 - 145

Isotope Dilution	MS %Recovery	MS Qualifier	Limits
13C4 PFBA	90.6		10 - 130
13C5 PFPeA	57.1		35 - 150
13C5 PFHxA	63.1		55 - 150
13C4 PFHpA	83.4		55 - 150
13C8 PFOA	65.7		60 - 140
13C9 PFNA	109		55 - 140
13C6 PFDA	110		50 - 140
13C7 PFUnA	86.6		30 - 140
13C2 PFTeDA	57.7		10 - 130
13C3 PFBS	96.7		55 - 150
13C3 PFHxS	98.8		55 - 150
13C8 PFOS	97.4		45 - 140
13C8 FOSA	93.3		30 - 130
d3-NMeFOSAA	64.7		45 - 200
d5-NEtFOSAA	76.9		10 - 200
M2-4:2 FTS	89.5		60 - 200
M2-6:2 FTS	104		60 - 200
M2-8:2 FTS	110		50 - 200
13C3 HFPO-DA	77.0		25 - 160
d7-N-MeFOSE-M	69.7		10 - 150
d9-N-EtFOSE-M	62.6		10 - 150
d5-NEtPFOSA	52.4		10 - 130
d3-NMePFOSA	57.6		15 - 130
13C2-PFDoDA	71.0		10 - 150

Lab Sample ID: 480-223347-B-1-B MSD

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 627062

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	8.36	U	103	99.15		ng/L		97	58 - 148	2	30
Perfluoropentanoic acid (PFPeA)	28.8		51.3	74.59		ng/L		89	54 - 152	8	30
Perfluorohexanoic acid (PFHxA)	23.4		25.7	51.01		ng/L		108	55 - 152	12	30
Perfluoroheptanoic acid (PFHpA)	24.6		25.7	48.93		ng/L		95	54 - 154	2	30
Perfluorooctanoic acid (PFOA)	471		25.7	492.8		ng/L		84	52 - 161	1	30
Perfluorononanoic acid (PFNA)	52.4		25.7	75.86		ng/L		91	59 - 149	3	30
Perfluorodecanoic acid (PFDA)	2.07	J	25.7	26.11		ng/L		94	52 - 147	5	30

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QC Sample Results

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: 480-223347-B-1-B MSD

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 627062

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluoroundecanoic acid (PFUnA)	1.65	J	25.7	24.12		ng/L		88	48 - 159	2	30
Perfluorododecanoic acid (PFDoA)	2.09	U	25.7	25.69		ng/L		100	64 - 142	3	30
Perfluorotridecanoic acid (PFTrDA)	0.86	J	25.7	23.38		ng/L		88	49 - 148	19	30
Perfluorotetradecanoic acid (PFTeDA)	2.09	U	25.7	24.78		ng/L		97	47 - 161	6	30
Perfluorobutanesulfonic acid (PFBS)	10.4		22.7	35.30		ng/L		110	62 - 144	6	30
Perfluoropentanesulfonic acid (PFPeS)	2.09	U	24.1	26.78		ng/L		111	59 - 151	3	30
Perfluorohexanesulfonic acid (PFHxS)	6.76		23.3	34.10		ng/L		117	57 - 146	2	30
Perfluoroheptanesulfonic acid (PFHpS)	0.52	J	24.4	25.58		ng/L		105	55 - 152	4	30
Perfluorooctanesulfonic acid (PFOS)	13.3		23.8	34.62		ng/L		89	58 - 149	3	30
Perfluorononanesulfonic acid (PFNS)	2.09	U	24.6	19.52		ng/L		79	52 - 148	2	30
Perfluorododecanesulfonic acid (PFDoS)	2.09	U	24.8	11.58		ng/L		47	36 - 145	8	30
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	8.36	U	95.9	95.96		ng/L		100	67 - 146	3	30
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	3.33	J	97.3	98.85		ng/L		98	61 - 151	5	30
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	5.99	J	98.3	99.91		ng/L		96	63 - 152	3	30
Perfluorooctanesulfonamide (PFOSA)	0.57	J	25.7	28.09		ng/L		107	61 - 148	1	30
N-methylperfluorooctane sulfonamide (NMeFOSA)	2.09	U	25.7	27.99		ng/L		109	63 - 145	2	30
N-ethylperfluorooctane sulfonamide (NEtFOSA)	2.09	U	25.7	26.54		ng/L		103	65 - 139	5	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.09	U	25.7	26.95		ng/L		105	58 - 144	3	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.09	U	25.7	22.85		ng/L		89	59 - 146	1	30
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	20.9	U	257	241.3		ng/L		94	71 - 136	10	30
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	20.9	U	257	257.8		ng/L		100	69 - 137	8	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	8.36	U	103	95.66		ng/L		93	63 - 144	4	30
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	8.36	U	96.7	145.5 *		ng/L		150	68 - 146	3	30
Perfluoro-4-methoxybutanoic acid (PFMBA)	4.18	U	51.3	59.90		ng/L		117	55 - 148	3	30
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	4.18	U	51.3	41.30		ng/L		80	48 - 161	5	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	8.36	U	95.6	115.5		ng/L		121	56 - 156	3	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	8.36	U	96.7	72.33		ng/L		75	46 - 156	7	30
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	4.18	U	45.7	65.91		ng/L		144	56 - 151	1	30

Eurofins Edison

QC Sample Results

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: 480-223347-B-1-B MSD

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 627062

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
3-Perfluoropropylpropanoic acid (3:3 FTCA)	10.5	U	128	140.5		ng/L		109	62 - 129	9	30
3-Perfluoropentylpropanoic acid (5:3 FTCA)	52.3	U	641	711.7		ng/L		111	63 - 134	2	30
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	52.3	U	641	948.8	*	ng/L		148	50 - 138	4	30
Perfluorodecanesulfonic acid (PFDS)	2.09	U	24.7	15.28		ng/L		62	51 - 147	4	30
Perfluoro-3-methoxypropanoic acid (PFMPA)	4.18	U	51.3	49.61		ng/L		97	51 - 145	3	30

Isotope Dilution	MSD %Recovery	MSD Qualifier	MSD Limits
13C4 PFBA	90.7		10 - 130
13C5 PFPeA	60.9		35 - 150
13C5 PFHxA	67.6		55 - 150
13C4 PFHpA	89.3		55 - 150
13C8 PFOA	66.7		60 - 140
13C9 PFNA	107		55 - 140
13C6 PFDA	105		50 - 140
13C7 PFUnA	77.5		30 - 140
13C2 PFTeDA	46.4		10 - 130
13C3 PFBS	92.3		55 - 150
13C3 PFHxS	97.3		55 - 150
13C8 PFOS	98.6		45 - 140
13C8 FOSA	95.6		30 - 130
d3-NMeFOSAA	63.2		45 - 200
d5-NEtFOSAA	78.2		10 - 200
M2-4:2 FTS	86.8		60 - 200
M2-6:2 FTS	104		60 - 200
M2-8:2 FTS	102		50 - 200
13C3 HFPO-DA	78.1		25 - 160
d7-N-MeFOSE-M	71.3		10 - 150
d9-N-EtFOSE-M	61.1		10 - 150
d5-NEtPFOSA	51.2		10 - 130
d3-NMePFOSA	59.2		15 - 130
13C2-PFDoDA	59.8		10 - 150

Lab Sample ID: 480-223347-D-3-A DU

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Duplicate

Prep Type: Total/NA

Prep Batch: 627062

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	13.0		13.34		ng/L		3	30
Perfluoropentanoic acid (PFPeA)	52.5		52.28		ng/L		0.5	30
Perfluorohexanoic acid (PFHxA)	34.0		32.09		ng/L		6	30
Perfluoroheptanoic acid (PFHpA)	31.2		29.35		ng/L		6	30
Perfluorooctanoic acid (PFOA)	39.1		38.63		ng/L		1	30
Perfluorononanoic acid (PFNA)	30.6		26.15		ng/L		16	30
Perfluorodecanoic acid (PFDA)	3.41		3.414		ng/L		0.2	30

Eurofins Edison

QC Sample Results

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: 480-223347-D-3-A DU

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Duplicate

Prep Type: Total/NA

Prep Batch: 627062

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Perfluoroundecanoic acid (PFUnA)	2.13		1.921	J	ng/L		10	30
Perfluorododecanoic acid (PFDoA)	2.09	U	2.05	U	ng/L		NC	30
Perfluorotridecanoic acid (PFTrDA)	2.09	U	2.05	U	ng/L		NC	30
Perfluorotetradecanoic acid (PFTeDA)	2.09	U	2.05	U	ng/L		NC	30
Perfluorobutanesulfonic acid (PFBS)	2.79		2.695		ng/L		3	30
Perfluoropentanesulfonic acid (PFPeS)	3.94		3.663		ng/L		7	30
Perfluorohexanesulfonic acid (PFHxS)	19.2		20.63		ng/L		7	30
Perfluoroheptanesulfonic acid (PFHpS)	2.09	U	2.05	U	ng/L		NC	30
Perfluorooctanesulfonic acid (PFOS)	20.7		22.39		ng/L		8	30
Perfluorononanesulfonic acid (PFNS)	2.09	U	2.05	U	ng/L		NC	30
Perfluorododecanesulfonic acid (PFDoS)	2.09	U	2.05	U	ng/L		NC	30
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	8.35	U	8.19	U	ng/L		NC	30
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	61.6		59.33		ng/L		4	30
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	8.35	U	8.19	U	ng/L		NC	30
Perfluorooctanesulfonamide (PFOSA)	2.09	U	2.05	U	ng/L		NC	30
N-methylperfluorooctane sulfonamide (NMeFOSA)	2.09	U	2.05	U	ng/L		NC	30
N-ethylperfluorooctane sulfonamide (NEtFOSA)	2.09	U	2.05	U	ng/L		NC	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.09	U	2.05	U	ng/L		NC	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.09	U	2.05	U	ng/L		NC	30
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	20.9	U	20.5	U	ng/L		NC	30
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	20.9	U	20.5	U	ng/L		NC	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	8.35	U	8.19	U	ng/L		NC	30
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	8.35	U	8.19	U	ng/L		NC	30
Perfluoro-4-methoxybutanoic acid (PFMBA)	4.18	U	4.10	U	ng/L		NC	30
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	4.18	U	4.10	U	ng/L		NC	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	8.35	U	8.19	U	ng/L		NC	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	8.35	U	8.19	U	ng/L		NC	30
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	4.18	U	4.10	U	ng/L		NC	30

Eurofins Edison

QC Sample Results

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: 480-223347-D-3-A DU

Matrix: Water

Analysis Batch: 627188

Client Sample ID: Duplicate

Prep Type: Total/NA

Prep Batch: 627062

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
3-Perfluoropropylpropanoic acid (3:3 FTCA)	10.4	U	10.2	U	ng/L		NC	30
3-Perfluoropentylpropanoic acid (5:3 FTCA)	52.2	U	51.2	U	ng/L		NC	30
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	52.2	U	51.2	U	ng/L		NC	30
Perfluorodecanesulfonic acid (PFDS)	2.09	U	2.05	U	ng/L		NC	30
Perfluoro-3-methoxypropanoic acid (PFMPA)	4.18	U	4.10	U	ng/L		NC	30

Isotope Dilution	%Recovery	DU Qualifier	Limits
13C4 PFBA	89.5		10 - 130
13C5 PFPeA	61.4		35 - 150
13C5 PFHxA	68.5		55 - 150
13C4 PFHpA	88.4		55 - 150
13C8 PFOA	69.3		60 - 140
13C9 PFNA	124		55 - 140
13C6 PFDA	104		50 - 140
13C7 PFUnA	101		30 - 140
13C2 PFTeDA	72.9		10 - 130
13C3 PFBS	95.1		55 - 150
13C3 PFHxS	87.1		55 - 150
13C8 PFOS	91.3		45 - 140
13C8 FOSA	99.8		30 - 130
d3-NMeFOSAA	67.4		45 - 200
d5-NEtFOSAA	84.4		10 - 200
M2-4:2 FTS	90.5		60 - 200
M2-6:2 FTS	97.7		60 - 200
M2-8:2 FTS	111		50 - 200
13C3 HFPO-DA	79.2		25 - 160
d7-N-MeFOSE-M	72.1		10 - 150
d9-N-EtFOSE-M	74.7		10 - 150
d5-NEtPFOSA	66.0		10 - 130
d3-NMePFOSA	67.1		15 - 130
13C2-PFDoDA	83.0		10 - 150

QC Association Summary

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

LCMS

Prep Batch: 627062

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-311274-1	RXMW-6_P	Total/NA	Water	1633	
460-311274-2	FB_09122024_P	Total/NA	Water	1633	
MB 240-627062/1-A	Method Blank	Total/NA	Water	1633	
LCS 240-627062/3-A	Lab Control Sample	Total/NA	Water	1633	
LLCS 240-627062/2-A	Lab Control Sample	Total/NA	Water	1633	
480-223347-A-1-C MS	Matrix Spike	Total/NA	Water	1633	
480-223347-B-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	1633	
480-223347-D-3-A DU	Duplicate	Total/NA	Water	1633	

Analysis Batch: 627188

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-311274-1	RXMW-6_P	Total/NA	Water	1633	627062
460-311274-2	FB_09122024_P	Total/NA	Water	1633	627062
MB 240-627062/1-A	Method Blank	Total/NA	Water	1633	627062
LCS 240-627062/3-A	Lab Control Sample	Total/NA	Water	1633	627062
LLCS 240-627062/2-A	Lab Control Sample	Total/NA	Water	1633	627062
480-223347-A-1-C MS	Matrix Spike	Total/NA	Water	1633	627062
480-223347-B-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	1633	627062
480-223347-D-3-A DU	Duplicate	Total/NA	Water	1633	627062

Lab Chronicle

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Client Sample ID: RXMW-6_P
Date Collected: 09/12/24 12:45
Date Received: 09/12/24 19:00

Lab Sample ID: 460-311274-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	1633			627062	JVB4	EET CLE	09/16/24 08:32
Total/NA	Analysis	1633		1	627188	MRL	EET CLE	09/17/24 00:00

Client Sample ID: FB_09122024_P
Date Collected: 09/12/24 13:55
Date Received: 09/12/24 19:00

Lab Sample ID: 460-311274-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	1633			627062	JVB4	EET CLE	09/16/24 08:32
Total/NA	Analysis	1633		1	627188	MRL	EET CLE	09/17/24 00:13

Laboratory References:
EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

Accreditation/Certification Summary

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Laboratory: Eurofins Cleveland

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-28-25
Georgia	State	4062	02-27-25
Illinois	NELAP	200004	08-31-25
Iowa	State	421	06-01-25
Kentucky (UST)	State	112225	02-27-25
Kentucky (WW)	State	KY98016	12-30-24
Minnesota	NELAP	039-999-348	12-31-24
New Jersey	NELAP	OH001	07-03-25
New York	NELAP	10975	04-02-25
Ohio VAP	State	ORELAP 4062	02-27-25
Oregon	NELAP	4062	02-27-25
Pennsylvania	NELAP	68-00340	08-31-25
Texas	NELAP	T104704517-22-19	08-31-25
USDA	US Federal Programs	P330-18-00281	01-05-27
Virginia	NELAP	460175	09-14-24 *
West Virginia DEP	State	210	12-31-24

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins Edison

Method Summary

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Method	Method Description	Protocol	Laboratory
1633	Per- and Polyfluoroalkyl Substances by LC/MS/MS	EPA	EET CLE
1633	Solid-Phase Extraction (SPE)	EPA	EET CLE

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

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Sample Summary

Client: Roux Environmental Eng & Geology DPC
Project/Site: 2828 W 28th Street

Job ID: 460-311274-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
460-311274-1	RXMW-6_P	Water	09/12/24 12:45	09/12/24 19:00
460-311274-2	FB_09122024_P	Water	09/12/24 13:55	09/12/24 19:00

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Job Number:

31/274

Number of Coolers:

UR Gun #

Cooler Temperatures

	RAW		CORRECTED	
	RAW	CORRECTED	RAW	CORRECTED
Cooler #1:	127 °C	116 °C	Cooler #4:	°C
Cooler #2:	°C	°C	Cooler #5:	°C
Cooler #3:	°C	°C	Cooler #6:	°C
			Cooler #7:	°C
			Cooler #8:	°C
			Cooler #9:	°C

[illegible]

If pH adjustments are required record the information below:

Sample No(s). adjusted:

Preservative Name/Conc.:

Lot # of Preservative(s):

Expiration Date: _____
The appropriate Project Manager and Department Manager should be notified about the samples which were pH adjusted.

Samples for Metal analysis which are out of compliance must be acidified at least 24 hours prior to analysis.

Initials:

Date: 9-12-24

~~1.2~~
1.1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
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- 11
- 12
- 13
- 14
- 15

Eurofins - Cleveland Sample Receipt Form/Narrative		Login # : _____	
Barberton Facility			
Client <u>IntelLab</u>	Site Name _____	Cooler unpacked by: <u>TF</u>	
Cooler Received on <u>9/14/24</u>	Opened on <u>9/14/24</u>		
FedEx: 1 st Grd <u>Exp</u>	UPS FAS Waypoint	Client Drop Off	Eurofins Courier Other _____
Receipt After-hours, Drop-Off Date/Time _____		Storage Location _____	
Eurofins Cooler # <u>5446</u>	Foam Box	Client Cooler	Box Other _____
Packing material used. Bubble Wrap Foam Plastic Bag <u>None</u> Other _____			
COOLANT: <u>VerIce</u>	Blue Ice	Dry Ice	Water None
☐ See Multiple Cooler Form			
1 Cooler temperature upon receipt	IR GUN # <u>72</u> (CF <u>-0.1</u> °C)	Observed Cooler Temp. <u>1.2</u> °C	Corrected Cooler Temp. <u>1.1</u> °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity <u>1</u> <u>Yes</u> <u>No</u> -Were the seals on the outside of the cooler(s) signed & dated? <u>Yes</u> <u>No</u> <u>NA</u> -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? <u>Yes</u> <u>No</u> -Were tamper/custody seals intact and uncompromised? <u>Yes</u> <u>No</u> <u>NA</u>			
3 Shippers' packing slip attached to the cooler(s)? <u>Yes</u> <u>No</u> <u>NA</u>			
4 Did custody papers accompany the sample(s)? <u>Yes</u> <u>No</u> <u>NA</u>			
5 Were the custody papers relinquished & signed in the appropriate place? <u>Yes</u> <u>No</u> <u>NA</u>			
6 Was/were the person(s) who collected the samples clearly identified on the COC? <u>Yes</u> <u>No</u> <u>NA</u>			
7 Did all bottles arrive in good condition (Unbroken)? <u>Yes</u> <u>No</u> <u>NA</u>			
8 Could all bottle labels (ID/Date/Time) be reconciled with the COC? <u>Yes</u> <u>No</u> <u>NA</u>			
9 For each sample, does the COC specify preservatives (<u>Y/N</u>), # of containers (<u>Y/N</u>), and sample type of grab/comp (<u>Y/N</u>)? <u>Yes</u> <u>No</u> <u>NA</u>			
10 Were correct bottle(s) used for the test(s) indicated? <u>Yes</u> <u>No</u> <u>NA</u>			
11 Sufficient quantity received to perform indicated analyses? <u>Yes</u> <u>No</u> <u>NA</u>			
12. Are these work share samples and all listed on the COC? <u>Yes</u> <u>No</u> <u>NA</u>			
If yes, Questions 13-17 have been checked at the originating laboratory.			
13 Were all preserved sample(s) at the correct pH upon receipt? <u>Yes</u> <u>No</u> <u>NA</u> pH Strip Lot# HC442471			
14. Were VOAs on the COC? <u>Yes</u> <u>No</u> <u>NA</u>			
15 Were air bubbles >6 mm in any VOA vials? <u>Yes</u> <u>No</u> <u>NA</u>			
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ <u>Yes</u> <u>No</u> <u>NA</u>			
17 Was a LL Hg or Me Hg trip blank present? <u>Yes</u> <u>No</u> <u>NA</u>			
Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____			
Concerning _____			
18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page		Samples processed by: _____	
19. SAMPLE CONDITION			
Sample(s) _____ were received after the recommended holding time had expired.			
Sample(s) _____ were received in a broken container			
Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)			
20. SAMPLE PRESERVATION			
Sample(s) _____ were further preserved in the laboratory			
Time preserved. _____ Preservative(s) added/Lot number(s) _____			
VOA Sample Preservation - Date/Time VOAs Frozen. _____			

585C2/ADP- C6C4

18 04/26 EXP MTW 434-150481#

SENDER

SHIPPING/RECEIVING
EUBROFINS ENVIRONMENT TESTING NORTH
480 S. VAN BUREN AVENUE

BARBERTON OH 44203
497-3586
HIS 4460-186169

edEX
Express

1241023112203 ny

6553 1012 9335

SATURDAY 12:00P
PRIORITY OVERNIGHT

44203
OH-US. CLE

FILE
OH-US-

9/20/2024

Login Sample Receipt Checklist

Client: Roux Environmental Eng & Geology DPC

Job Number: 460-311274-1

Login Number: 311274

List Source: Eurofins Edison

List Number: 1

Creator: Thundathorn, Sukanan 1

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	