BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LW18

Description: PFAS DoD Surrogate (43 Targets)

Stock Id: 220124-04

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230124-01

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
d3-MeFOSA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230124-05

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
d7-MeFOSE	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230124-06

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
d9-EtFOSE	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230124-09

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
d5-EtFOSA	1000	50.00	1	98.000	1	100	0.50000

Final Concentrations:

Analyte:	Conc (ug/mL):
13C2-PFHxDA	.50000
d3-MeFOSA	.50000
d5-EtFOSA	.50000
d7-MeFOSE	.50000
d9-EtFOSE	.50000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
220124-04	Pipette	B909301606
230124-01	Pipette	B909301606
230124-05	Pipette	B909301606
230124-06	Pipette	B909301606
230124-09	Pipette	B909301606

Solution Prepared By: Beal, Hayley **Date Prepared:** 3/14/2023 **Expiration Date:** 3/14/2024

Solution Volume 50 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Lizotte Jr, Robert **Date:** 3/21/2023 11:25:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LX91

Description: PFAS DoD Second Source LCS/MS (18 Analytes)

Stock Id: 221103-02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	4000	2.00	1	100.000	1	20	0.40000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	4000	2.00	1	100.000	1	20	0.40000
Adona	4000	2.00	1	100.000	1	20	0.40000
Hexafluoropropylene oxide dimer acid	4000	2.00	1	100.000	1	20	0.40000
N-ethylperfluoro-octanesulfonamidoacetic acid	4000	2.00	1	100.000	1	20	0.40000
N-methylperfluoro-1-octanesulfonamidoacetic acid	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-1-butanesulfonate	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-1-hexanesulfonate	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-1-octanesulfonate	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-n-decanoic Acid	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-n-dodecanoic acid	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-n-heptanoic Acid	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-n-hexanoic acid	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-n-octanoic Acid	4000	2.00	1	100.000	1	20	0.40000
Perfluorononanoic Acid	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-n-tetradecanoic acid	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-n-tridecanoic acid	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-n-undecanoic acid	4000	2.00	1	100.000	1	20	0.40000

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.40000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.40000
Adona	.40000
Hexafluoropropylene oxide dimer acid	.40000
N-ethylperfluoro-octanesulfonamidoacetic acid	.40000
N-methylperfluoro-1-octanesulfonamidoacetic acid	.40000
Perfluoro-1-butanesulfonate	.40000
Perfluoro-1-hexanesulfonate	.40000
Perfluoro-1-octanesulfonate	.40000
Perfluoro-n-decanoic Acid	.40000
Perfluoro-n-dodecanoic acid	.40000
Perfluoro-n-heptanoic Acid	.40000
Perfluoro-n-hexanoic acid	.40000
Perfluoro-n-octanoic Acid	.40000
Perfluorononanoic Acid	.40000

Solution Prepared By: Dreiker, Zachary **Date Prepared:** 5/23/2023 **Expiration Date:** 5/23/2024

Solution Volume : 50 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 5/25/2023 11:33:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LX91**

Description: PFAS DoD Second Source LCS/MS (18 Analytes)

Perfluoro-n-tetradecanoic acid	.40000
Perfluoro-n-tridecanoic acid	.40000
Perfluoro-n-undecanoic acid	.40000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
221103-02	Pipette	B814658143

Solution Prepared By: Dreiker, Zachary **Date Prepared:** 5/23/2023 **Expiration Date:** 5/23/2024

Solution Volume : 50 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 5/25/2023 11:33:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LX92

Description: PFAS DoD Surrogate (18 Targets)

Stock Id: 230306-08

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C3-HFPO-DA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-09

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
d3-MeFOSAA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-10

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
d5-EtFOSAA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-11

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C3-PFBS	1000	46.60	1	98.000	1	100	0.46600

Stock Id: 230306-12

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C3-PFHxS	1000	47.40	1	98.000	1	100	0.47400

Stock Id: 230306-13

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C8-PFOS	1000	47.90	1	98.000	1	100	0.47900

Stock Id: 230306-14

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-15

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFTeDA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-16

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C6-PFDA	1000	50.00	1	98.000	1	100	0.50000

Solution Prepared By: Beal, Hayley **Date Prepared:** 5/23/2023 **Expiration Date:** 5/23/2024

Solution Volume : 50 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 5/25/2023 9:01:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LX92

Description: PFAS DoD Surrogate (18 Targets)

Stock Id: 230306-17

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C7-PFUnA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C5-PFHxA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-19

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C4-PFHpA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-20

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C9-PFNA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-24

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C8-PFOA	1000	50.00	1	98.000	1	100	0.50000

Final Concentrations:

Analyte:	Conc (ug/mL):
13C2-PFDoA	.50000
13C2-PFTeDA	.50000
13C3-HFPO-DA	.50000
13C3-PFBS	.46600
13C3-PFHxS	.47400
13C4-PFHpA	.50000
13C5-PFHxA	.50000
13C6-PFDA	.50000
13C7-PFUnA	.50000
13C8-PFOA	.50000
13C8-PFOS	.47900
13C9-PFNA	.50000
d3-MeFOSAA	.50000
d5-EtFOSAA	.50000

Solution Prepared By: Beal, Hayley **Date Prepared:** 5/23/2023 **Expiration Date:** 5/23/2024

Solution Volume : 50 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 5/25/2023 9:01:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LX92

Description: PFAS DoD Surrogate (18 Targets)

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
230306-08	Pipette	B820865811
230306-09	Pipette	B820865811
230306-10	Pipette	B820865811
230306-11	Pipette	B820865811
230306-12	Pipette	B820865811
230306-13	Pipette	B820865811
230306-14	Pipette	B820865811
230306-15	Pipette	B820865811
230306-16	Pipette	B820865811
230306-17	Pipette	B820865811
230306-18	Pipette	B820865811
230306-19	Pipette	B820865811
230306-20	Pipette	B820865811
230306-24	Pipette	B820865811

Solution Prepared By: Beal, Hayley **Date Prepared:** 5/23/2023 **Expiration Date:** 5/23/2024

Solution Volume : 50 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 5/25/2023 9:01:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LY34

Description: PFAS IRAD MS Stock

Stock Id: 230608-01

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-1-dodecanesulfonate	600	48.50	1	98.000	1	7.5	3.88000

Stock Id: 230608-02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro (2-ethoxyethane) sulfonic acid	600	44.60	1	98.000	1	7.5	3.56800

Stock Id: 230608-03

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
1H,1H,2H,2H-perfluorododecane sulfonate	600	48.30	1	98.000	1	7.5	3.86400

Stock Id: 230608-04

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
N-methylperfluoro-1-octanesulfonamide	600	50.00	1	98.000	1	7.5	4.00000

Stock Id: 230608-05

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
N-ethylperfluoro-1-octanesulfonamide	600	50.00	1	98.000	1	7.5	4.00000

Stock Id: 230608-06

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	600	50.00	1	98.000	1	7.5	4.00000

Stock Id: 230608-07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	600	50.00	1	98.000	1	7.5	4.00000

Stock Id: 230608-08

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-3-methoxypropanoic acid	600	50.00	1	98.000	1	7.5	4.00000

Stock Id: 230608-09

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
nonafluoro-3,6-dioxaheptanoic acid	600	50.00	1	98.000	1	7.5	4.00000

Solution Prepared By: Kinsman, Nathaniel **Date Prepared:** 6/8/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Lizotte Jr, Robert **Date:** 6/13/2023 8:54:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LY34

Description: PFAS IRAD MS Stock

Stock Id: 230608-10

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-4-methoxybutanoic acid	600	50.00	1	98.000	1	7.5	4.00000

Stock Id: 230608-11

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-n-hexadecanoic acid	600	50.00	1	98.000	1	7.5	4.00000

Stock Id: 230608-12

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-n-octadecanoic acid	600	50.00	1	98.000	1	7.5	4.00000

Final Concentrations:

Analyte:	Conc (ug/mL):
1H,1H,2H,2H-perfluorododecane sulfonate	3.86400
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	4.00000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	4.00000
N-ethylperfluoro-1-octanesulfonamide	4.00000
N-methylperfluoro-1-octanesulfonamide	4.00000
nonafluoro-3,6-dioxaheptanoic acid	4.00000
Perfluoro (2-ethoxyethane) sulfonic acid	3.56800
Perfluoro-1-dodecanesulfonate	3.88000
Perfluoro-3-methoxypropanoic acid	4.00000
Perfluoro-4-methoxybutanoic acid	4.00000
Perfluoro-n-hexadecanoic acid	4.00000
Perfluoro-n-octadecanoic acid	4.00000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
230608-01	Pipette	B909301606
230608-02	Pipette	B909301606
230608-03	Pipette	B909301606
230608-04	Pipette	B909301606
230608-05	Pipette	B909301606
230608-06	Pipette	B909301606
230608-07	Pipette	B909301606

Solution Prepared By: Kinsman, Nathaniel **Date Prepared:** 6/8/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Lizotte Jr, Robert **Date:** 6/13/2023 8:54:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LY34**

Description: PFAS IRAD MS Stock

230608-08	Pipette	B909301606
230608-09	Pipette	B909301606
230608-10	Pipette	B909301606
230608-11	Pipette	B909301606
230608-12	Pipette	B909301606

Solution Prepared By: Kinsman, Nathaniel **Date Prepared:** 6/8/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Lizotte Jr, Robert **Date:** 6/13/2023 8:54:00 AM

BATTELLE

It can be done

Standard Solution Concentrations

Approved: ☐

Standard Laboratory ID Number: LY35

Description: PFAS IRAD ICAL Stock 1

Stock Id: 230608-01

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-1-dodecanesulfonate	400	48.50	1	98.000	1	5	3.88000

Stock Id: 230608-02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro (2-ethoxyethane) sulfonic acid	400	44.60	1	98.000	1	5	3.56800

Stock Id: 230608-03

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
1H,1H,2H,2H-perfluorododecane sulfonate	400	48.30	1	98.000	1	5	3.86400

Stock Id: 230608-04

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
N-methylperfluoro-1-octanesulfonamide	400	50.00	1	98.000	1	5	4.00000

Stock Id: 230608-05

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
N-ethylperfluoro-1-octanesulfonamide	400	50.00	1	98.000	1	5	4.00000

Stock Id: 230608-06

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	400	50.00	1	98.000	1	5	4.00000

Stock Id: 230608-07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	400	50.00	1	98.000	1	5	4.00000

Stock Id: 230608-08

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-3-methoxypropanoic acid	400	50.00	1	98.000	1	5	4.00000

Stock Id: 230608-09

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
nonafluoro-3,6-dioxaheptanoic acid	400	50.00	1	98.000	1	5	4.00000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 6/8/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: _____ **Date:** _____

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☐

Standard Laboratory ID Number: LY35

Description: PFAS IRAD ICAL Stock 1

Stock Id: 230608-10

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-4-methoxybutanoic acid	400	50.00	1	98.000	1	5	4.00000

Stock Id: 230608-11

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-n-hexadecanoic acid	400	50.00	1	98.000	1	5	4.00000

Stock Id: 230608-12

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-n-octadecanoic acid	400	50.00	1	98.000	1	5	4.00000

Final Concentrations:

Analyte:	Conc (ug/mL):
1H,1H,2H,2H-perfluorododecane sulfonate	3.86400
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	4.00000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	4.00000
N-ethylperfluoro-1-octanesulfonamide	4.00000
N-methylperfluoro-1-octanesulfonamide	4.00000
nonafluoro-3,6-dioxaheptanoic acid	4.00000
Perfluoro (2-ethoxyethane) sulfonic acid	3.56800
Perfluoro-1-dodecanesulfonate	3.88000
Perfluoro-3-methoxypropanoic acid	4.00000
Perfluoro-4-methoxybutanoic acid	4.00000
Perfluoro-n-hexadecanoic acid	4.00000
Perfluoro-n-octadecanoic acid	4.00000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
230608-01	Pipette	B909301606
230608-02	Pipette	B909301606
230608-03	Pipette	B909301606
230608-04	Pipette	B909301606
230608-05	Pipette	B909301606
230608-06	Pipette	B909301606
230608-07	Pipette	B909301606

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 6/8/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: _____ **Date:** _____

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☐

Standard Laboratory ID Number: **LY35**

Description: PFAS IRAD ICAL Stock 1

230608-08	Pipette	B909301606
230608-09	Pipette	B909301606
230608-10	Pipette	B909301606
230608-11	Pipette	B909301606
230608-12	Pipette	B909301606

Solution Prepared By: Harnden, Kelsey		**Date Prepared:**	6/8/2023	**Expiration Date:**	6/8/2024
Solution Volume : 15 **mL X** 1 **Vials**		**Refrigerator/Freezer No:**	LC Laboratory #2: Refrigerator - R0121		

Comment:

Approved By: _____ **Date:** _____

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ02

Description: PFAS FTCA Stock

Stock Id: 230124-02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
3-perfluoropropyl propanoic Acid	1000	50.00	1	98.000	1	10	5.00000

Stock Id: 230124-03

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
3-Perfluoropentyl propanoic acid	1000	50.00	1	98.000	1	10	5.00000

Stock Id: 230124-04

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
3-Perfluoroheptyl propanoic acid	1000	50.00	1	98.000	1	10	5.00000

Final Concentrations:

Analyte:	Conc (ug/mL):
3-Perfluoroheptyl propanoic acid	5.00000
3-Perfluoropentyl propanoic acid	5.00000
3-perfluoropropyl propanoic Acid	5.00000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
230124-02	Pipette	B909301606
230124-03	Pipette	B909301606
230124-04	Pipette	B909301606

Solution Prepared By: Beal, Hayley **Date Prepared:** 7/13/2023 **Expiration Date:** 7/13/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Lizotte Jr, Robert **Date:** 7/25/2023 3:21:00 PM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ03

Description: PFAS DoD Second Source LCS/MS (28 Analytes)

Stock Id: 230113-01

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	5000	1.00	1	100.000	1	12.5	0.40000
1H,1H,2H,2H-Perfluorodecane sulfonate	5000	1.01	1	100.000	1	12.5	0.40400
1H,1H,2H,2H-Perfluorohexane sulfonate	5000	1.00	1	100.000	1	12.5	0.40000
1H,1H,2H,2H-Perfluorooctane sulfonate	5000	1.00	1	100.000	1	12.5	0.40000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	5000	1.00	1	100.000	1	12.5	0.40000
Adona	5000	1.00	1	100.000	1	12.5	0.40000
Hexafluoropropylene oxide dimer acid	5000	1.00	1	100.000	1	12.5	0.40000
N-ethylperfluoro-octanesulfonamidoacetic acid	5000	1.00	1	100.000	1	12.5	0.40000
N-methylperfluoro-1-octanesulfonamidoacetic acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-1-butanesulfonate	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-1-decanesulfonate	5000	1.01	1	100.000	1	12.5	0.40400
Perfluoro-1-heptanesulfonate	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-1-hexanesulfonate	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-1-nonanesulfonate	5000	1.01	1	100.000	1	12.5	0.40400
Perfluoro-1-octanesulfonamide	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-1-octanesulfonate	5000	1.00	1	100.000	1	12.5	0.40000
perfluoro-1-pentanesulfonate	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-butanoic Acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-decanoic Acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-dodecanoic acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-heptanoic Acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-hexanoic acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-octanoic Acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluorononanoic Acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-pentanoic acid	5000	1.01	1	100.000	1	12.5	0.40400
Perfluoro-n-tetradecanoic acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-tridecanoic acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-undecanoic acid	5000	1.00	1	100.000	1	12.5	0.40000

Stock Id: LZ02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
3-Perfluoroheptyl propanoic acid	1000	5.00	---	---	1	12.5	0.40000
3-Perfluoropentyl propanoic acid	1000	5.00	---	---	1	12.5	0.40000
3-perfluoropropyl propanoic Acid	1000	5.00	---	---	1	12.5	0.40000

Final Concentrations:

Solution Prepared By: Beal, Hayley **Date Prepared:** 7/13/2023 **Expiration Date:** 7/13/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 7/17/2023 11:03:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ03

Description: PFAS DoD Second Source LCS/MS (28 Analytes)

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.40000
1H,1H,2H,2H-Perfluorodecane sulfonate	.40400
1H,1H,2H,2H-Perfluorohexane sulfonate	.40000
1H,1H,2H,2H-Perfluorooctane sulfonate	.40000
3-Perfluoroheptyl propanoic acid	.40000
3-Perfluoropentyl propanoic acid	.40000
3-perfluoropropyl propanoic Acid	.40000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.40000
Adona	.40000
Hexafluoropropylene oxide dimer acid	.40000
N-ethylperfluoro-octanesulfonamidoacetic acid	.40000
N-methylperfluoro-1-octanesulfonamidoacetic acid	.40000
Perfluoro-1-butanesulfonate	.40000
Perfluoro-1-decanesulfonate	.40400
Perfluoro-1-heptanesulfonate	.40000
Perfluoro-1-hexanesulfonate	.40000
Perfluoro-1-nonanesulfonate	.40400
Perfluoro-1-octanesulfonamide	.40000
Perfluoro-1-octanesulfonate	.40000
perfluoro-1-pentanesulfonate	.40000
Perfluoro-n-butanoic Acid	.40000
Perfluoro-n-decanoic Acid	.40000
Perfluoro-n-dodecanoic acid	.40000
Perfluoro-n-heptanoic Acid	.40000
Perfluoro-n-hexanoic acid	.40000
Perfluoro-n-octanoic Acid	.40000
Perfluorononanoic Acid	.40000
Perfluoro-n-pentanoic acid	.40400
Perfluoro-n-tetradecanoic acid	.40000
Perfluoro-n-tridecanoic acid	.40000
Perfluoro-n-undecanoic acid	.40000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
230113-01	Pipette	B635939323
LZ02	Pipette	B909301606

Solution Prepared By: Beal, Hayley **Date Prepared:** 7/13/2023 **Expiration Date:** 7/13/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 7/17/2023 11:03:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ07

Description: PFAS DoD Internal Standard

Stock Id: 220728-19

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C4-PFOS	1000	47.90	1	98.000	1	100	0.47900

Stock Id: 230714-01

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C3-PFBA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230714-02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFOA	1000	50.00	1	98.000	1	100	0.50000

Final Concentrations:

Analyte:	Conc (ug/mL):
13C2-PFDA	.50000
13C2-PFOA	.50000
13C3-PFBA	.50000
13C4-PFOS	.47900

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
220728-19	Pipette	B909301606
230306-07	Pipette	B909301606
230714-01	Pipette	B909301606
230714-02	Pipette	B909301606

Solution Prepared By: Beal, Hayley **Date Prepared:** 7/17/2023 **Expiration Date:** 7/17/2024

Solution Volume : 50 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 7/20/2023 8:52:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ32

Description: PFAS DoD Second Source LCS/MS (43 Analytes)

Stock Id: 230113-01

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	2000	1.00	1	100.000	1	10	0.20000
1H,1H,2H,2H-Perfluorodecane sulfonate	2000	1.01	1	100.000	1	10	0.20200
1H,1H,2H,2H-Perfluorohexane sulfonate	2000	1.00	1	100.000	1	10	0.20000
1H,1H,2H,2H-Perfluorooctane sulfonate	2000	1.00	1	100.000	1	10	0.20000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	2000	1.00	1	100.000	1	10	0.20000
Adona	2000	1.00	1	100.000	1	10	0.20000
Hexafluoropropylene oxide dimer acid	2000	1.00	1	100.000	1	10	0.20000
N-ethylperfluoro-octanesulfonamidoacetic acid	2000	1.00	1	100.000	1	10	0.20000
N-methylperfluoro-1-octanesulfonamidoacetic acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-1-butanesulfonate	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-1-decanesulfonate	2000	1.01	1	100.000	1	10	0.20200
Perfluoro-1-heptanesulfonate	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-1-hexanesulfonate	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-1-nonanesulfonate	2000	1.01	1	100.000	1	10	0.20200
Perfluoro-1-octanesulfonamide	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-1-octanesulfonate	2000	1.00	1	100.000	1	10	0.20000
perfluoro-1-pentanesulfonate	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-butanoic Acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-decanoic Acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-dodecanoic acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-heptanoic Acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-hexanoic acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-octanoic Acid	2000	1.00	1	100.000	1	10	0.20000
Perfluorononanoic Acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-pentanoic acid	2000	1.01	1	100.000	1	10	0.20200
Perfluoro-n-tetradecanoic acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-tridecanoic acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-undecanoic acid	2000	1.00	1	100.000	1	10	0.20000

Stock Id: LY34

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
1H,1H,2H,2H-perfluorododecane sulfonate	500	3.86	---	---	1	10	0.19320
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	500	4.00	---	---	1	10	0.20000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	500	4.00	---	---	1	10	0.20000
N-ethylperfluoro-1-octanesulfonamide	500	4.00	---	---	1	10	0.20000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 7/27/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/1/2023 9:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ32

Description: PFAS DoD Second Source LCS/MS (43 Analytes)

N-methylperfluoro-1-octanesulfonamide	500	4.00	---	---	1	10	0.20000
nonafluoro-3,6-dioxaheptanoic acid	500	4.00	---	---	1	10	0.20000
Perfluoro (2-ethoxyethane) sulfonic acid	500	3.57	---	---	1	10	0.17840
Perfluoro-1-dodecanesulfonate	500	3.88	---	---	1	10	0.19400
Perfluoro-3-methoxypropanoic acid	500	4.00	---	---	1	10	0.20000
Perfluoro-4-methoxybutanoic acid	500	4.00	---	---	1	10	0.20000
Perfluoro-n-hexadecanoic acid	500	4.00	---	---	1	10	0.20000
Perfluoro-n-octadecanoic acid	500	4.00	---	---	1	10	0.20000

Stock Id: LZ02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
3-Perfluoroheptyl propanoic acid	400	5.00	---	---	1	10	0.20000
3-Perfluoropentyl propanoic acid	400	5.00	---	---	1	10	0.20000
3-perfluoropropyl propanoic Acid	400	5.00	---	---	1	10	0.20000

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.20000
1H,1H,2H,2H-Perfluorodecane sulfonate	.20200
1H,1H,2H,2H-perfluorododecane sulfonate	.19320
1H,1H,2H,2H-Perfluorohexane sulfonate	.20000
1H,1H,2H,2H-Perfluorooctane sulfonate	.20000
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.20000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.20000
3-Perfluoroheptyl propanoic acid	.20000
3-Perfluoropentyl propanoic acid	.20000
3-perfluoropropyl propanoic Acid	.20000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.20000
Adona	.20000
Hexafluoropropylene oxide dimer acid	.20000
N-ethylperfluoro-1-octanesulfonamide	.20000
N-ethylperfluoro-octanesulfonamidoacetic acid	.20000
N-methylperfluoro-1-octanesulfonamide	.20000
N-methylperfluoro-1-octanesulfonamidoacetic acid	.20000
nonafluoro-3,6-dioxaheptanoic acid	.20000
Perfluoro (2-ethoxyethane) sulfonic acid	.17840
Perfluoro-1-butanesulfonate	.20000
Perfluoro-1-decanesulfonate	.20200
Perfluoro-1-dodecanesulfonate	.19400

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 7/27/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/1/2023 9:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ32

Description: PFAS DoD Second Source LCS/MS (43 Analytes)

Perfluoro-1-heptanesulfonate	.20000
Perfluoro-1-hexanesulfonate	.20000
Perfluoro-1-nonanesulfonate	.20200
Perfluoro-1-octanesulfonamide	.20000
Perfluoro-1-octanesulfonate	.20000
perfluoro-1-pentanesulfonate	.20000
Perfluoro-3-methoxypropanoic acid	.20000
Perfluoro-4-methoxybutanoic acid	.20000
Perfluoro-n-butanoic Acid	.20000
Perfluoro-n-decanoic Acid	.20000
Perfluoro-n-dodecanoic acid	.20000
Perfluoro-n-heptanoic Acid	.20000
Perfluoro-n-hexadecanoic acid	.20000
Perfluoro-n-hexanoic acid	.20000
Perfluoro-n-octadecanoic acid	.20000
Perfluoro-n-octanoic Acid	.20000
Perfluorononanoic Acid	.20000
Perfluoro-n-pentanoic acid	.20200
Perfluoro-n-tetradecanoic acid	.20000
Perfluoro-n-tridecanoic acid	.20000
Perfluoro-n-undecanoic acid	.20000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
230113-01	Pipette	B909301606
LY34	Pipette	B909301606
LZ02	Pipette	B909301606

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 7/27/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/1/2023 9:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ39

Description: PFAS DoD Surrogate (28 Targets)

Stock Id: 230210-03

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C4-PFBA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230210-04

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C5-PFPeA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230210-05

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C8-FOSA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230210-06

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-6:2FTS	1000	47.60	1	98.000	1	100	0.47600

Stock Id: 230210-07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-8:2FTS	1000	48.00	1	98.000	1	100	0.48000

Stock Id: 230210-08

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	1000	46.90	1	98.000	1	100	0.46900

Final Concentrations:

Analyte:	Conc (ug/mL):
13C2-4:2FTS	.46900
13C2-6:2FTS	.47600
13C2-8:2FTS	.48000
13C4-PFBA	.50000
13C5-PFPeA	.50000
13C8-FOSA	.50000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
230210-03	Pipette	B909301606

Solution Prepared By: Beal, Hayley **Date Prepared:** 8/1/2023 **Expiration Date:** 8/1/2024

Solution Volume : 15 **mL X** 10 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/15/2023 9:57:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ39

Description: PFAS DoD Surrogate (28 Targets)

230210-04	Pipette	B909301606
230210-05	Pipette	B909301606
230210-06	Pipette	B909301606
230210-07	Pipette	B909301606
230210-08	Pipette	B909301606

Solution Prepared By: Beal, Hayley **Date Prepared:** 8/1/2023 **Expiration Date:** 8/1/2024

Solution Volume : 15 **mL X** 10 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/15/2023 9:57:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ79

Description: PFAS DoD ICAL High Stock

Stock Id: 230113-02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	2000	1.00	1	100.000	1	4	0.50000
1H,1H,2H,2H-Perfluorodecane sulfonate	2000	1.01	1	100.000	1	4	0.50500
1H,1H,2H,2H-Perfluorohexane sulfonate	2000	1.00	1	100.000	1	4	0.50000
1H,1H,2H,2H-Perfluorooctane sulfonate	2000	1.00	1	100.000	1	4	0.50000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	2000	1.00	1	100.000	1	4	0.50000
Adona	2000	1.00	1	100.000	1	4	0.50000
Hexafluoropropylene oxide dimer acid	2000	1.00	1	100.000	1	4	0.50000
N-ethylperfluoro-octanesulfonamidoacetic acid	2000	1.00	1	100.000	1	4	0.50000
N-methylperfluoro-1-octanesulfonamidoacetic acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-1-butanesulfonate	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-1-decanesulfonate	2000	1.01	1	100.000	1	4	0.50500
Perfluoro-1-heptanesulfonate	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-1-hexanesulfonate	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-1-nonanesulfonate	2000	1.01	1	100.000	1	4	0.50500
Perfluoro-1-octanesulfonamide	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-1-octanesulfonate	2000	1.00	1	100.000	1	4	0.50000
perfluoro-1-pentanesulfonate	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-butanoic Acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-decanoic Acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-dodecanoic acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-heptanoic Acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-hexanoic acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-octanoic Acid	2000	1.00	1	100.000	1	4	0.50000
Perfluorononanoic Acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-pentanoic acid	2000	1.01	1	100.000	1	4	0.50500
Perfluoro-n-tetradecanoic acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-tridecanoic acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-undecanoic acid	2000	1.00	1	100.000	1	4	0.50000

Stock Id: LY35

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
1H,1H,2H,2H-perfluorododecane sulfonate	500	3.86	---	---	1	4	0.48300
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	500	4.00	---	---	1	4	0.50000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	500	4.00	---	---	1	4	0.50000
N-ethylperfluoro-1-octanesulfonamide	500	4.00	---	---	1	4	0.50000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ79

Description: PFAS DoD ICAL High Stock

N-methylperfluoro-1-octanesulfonamide	500	4.00	---	---	1	4	0.50000
nonafluoro-3,6-dioxaheptanoic acid	500	4.00	---	---	1	4	0.50000
Perfluoro (2-ethoxyethane) sulfonic acid	500	3.57	---	---	1	4	0.44600
Perfluoro-1-dodecanesulfonate	500	3.88	---	---	1	4	0.48500
Perfluoro-3-methoxypropanoic acid	500	4.00	---	---	1	4	0.50000
Perfluoro-4-methoxybutanoic acid	500	4.00	---	---	1	4	0.50000
Perfluoro-n-hexadecanoic acid	500	4.00	---	---	1	4	0.50000
Perfluoro-n-octadecanoic acid	500	4.00	---	---	1	4	0.50000

Stock Id: LZ02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
3-Perfluoroheptyl propanoic acid	400	5.00	---	---	1	4	0.50000
3-Perfluoropentyl propanoic acid	400	5.00	---	---	1	4	0.50000
3-perfluoropropyl propanoic Acid	400	5.00	---	---	1	4	0.50000

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.50000
1H,1H,2H,2H-Perfluorodecane sulfonate	.50500
1H,1H,2H,2H-perfluorododecane sulfonate	.48300
1H,1H,2H,2H-Perfluorohexane sulfonate	.50000
1H,1H,2H,2H-Perfluorooctane sulfonate	.50000
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.50000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.50000
3-Perfluoroheptyl propanoic acid	.50000
3-Perfluoropentyl propanoic acid	.50000
3-perfluoropropyl propanoic Acid	.50000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.50000
Adona	.50000
Hexafluoropropylene oxide dimer acid	.50000
N-ethylperfluoro-1-octanesulfonamide	.50000
N-ethylperfluoro-octanesulfonamidoacetic acid	.50000
N-methylperfluoro-1-octanesulfonamide	.50000
N-methylperfluoro-1-octanesulfonamidoacetic acid	.50000
nonafluoro-3,6-dioxaheptanoic acid	.50000
Perfluoro (2-ethoxyethane) sulfonic acid	.44600
Perfluoro-1-butanesulfonate	.50000
Perfluoro-1-decanesulfonate	.50500
Perfluoro-1-dodecanesulfonate	.48500

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ79

Description: PFAS DoD ICAL High Stock

Perfluoro-1-heptanesulfonate	.50000
Perfluoro-1-hexanesulfonate	.50000
Perfluoro-1-nonanesulfonate	.50500
Perfluoro-1-octanesulfonamide	.50000
Perfluoro-1-octanesulfonate	.50000
perfluoro-1-pentanesulfonate	.50000
Perfluoro-3-methoxypropanoic acid	.50000
Perfluoro-4-methoxybutanoic acid	.50000
Perfluoro-n-butanoic Acid	.50000
Perfluoro-n-decanoic Acid	.50000
Perfluoro-n-dodecanoic acid	.50000
Perfluoro-n-heptanoic Acid	.50000
Perfluoro-n-hexadecanoic acid	.50000
Perfluoro-n-hexanoic acid	.50000
Perfluoro-n-octadecanoic acid	.50000
Perfluoro-n-octanoic Acid	.50000
Perfluorononanoic Acid	.50000
Perfluoro-n-pentanoic acid	.50500
Perfluoro-n-tetradecanoic acid	.50000
Perfluoro-n-tridecanoic acid	.50000
Perfluoro-n-undecanoic acid	.50000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
230113-02	Pipette	B820865811
LY35	Pipette	B820865811
LZ02	Pipette	B820865811

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ80

Description: PFAS DoD ICAL Low Stock 1

Stock Id: LZ79

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	1000	0.50	---	---	1	10	0.05000
1H,1H,2H,2H-Perfluorodecane sulfonate	1000	0.51	---	---	1	10	0.05050
1H,1H,2H,2H-perfluorododecane sulfonate	1000	0.48	---	---	1	10	0.04830
1H,1H,2H,2H-Perfluorohexane sulfonate	1000	0.50	---	---	1	10	0.05000
1H,1H,2H,2H-Perfluorooctane sulfonate	1000	0.50	---	---	1	10	0.05000
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	1000	0.50	---	---	1	10	0.05000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	1000	0.50	---	---	1	10	0.05000
3-Perfluoroheptyl propanoic acid	1000	0.50	---	---	1	10	0.05000
3-Perfluoropentyl propanoic acid	1000	0.50	---	---	1	10	0.05000
3-perfluoropropyl propanoic Acid	1000	0.50	---	---	1	10	0.05000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	1000	0.50	---	---	1	10	0.05000
Adona	1000	0.50	---	---	1	10	0.05000
Hexafluoropropylene oxide dimer acid	1000	0.50	---	---	1	10	0.05000
N-ethylperfluoro-1-octanesulfonamide	1000	0.50	---	---	1	10	0.05000
N-ethylperfluoro-octanesulfonamidoacetic acid	1000	0.50	---	---	1	10	0.05000
N-methylperfluoro-1-octanesulfonamide	1000	0.50	---	---	1	10	0.05000
N-methylperfluoro-1-octanesulfonamidoacetic acid	1000	0.50	---	---	1	10	0.05000
nonafluoro-3,6-dioxaheptanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro (2-ethoxyethane) sulfonic acid	1000	0.45	---	---	1	10	0.04460
Perfluoro-1-butanesulfonate	1000	0.50	---	---	1	10	0.05000
Perfluoro-1-decanesulfonate	1000	0.51	---	---	1	10	0.05050
Perfluoro-1-dodecanesulfonate	1000	0.49	---	---	1	10	0.04850
Perfluoro-1-heptanesulfonate	1000	0.50	---	---	1	10	0.05000
Perfluoro-1-hexanesulfonate	1000	0.50	---	---	1	10	0.05000
Perfluoro-1-nonanesulfonate	1000	0.51	---	---	1	10	0.05050
Perfluoro-1-octanesulfonamide	1000	0.50	---	---	1	10	0.05000
Perfluoro-1-octanesulfonate	1000	0.50	---	---	1	10	0.05000
perfluoro-1-pentanesulfonate	1000	0.50	---	---	1	10	0.05000
Perfluoro-3-methoxypropanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-4-methoxybutanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-butanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-decanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-dodecanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-heptanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-hexadecanoic acid	1000	0.50	---	---	1	10	0.05000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ80

Description: PFAS DoD ICAL Low Stock 1

Perfluoro-n-hexanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-octadecanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-octanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluorononanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-pentanoic acid	1000	0.51	---	---	1	10	0.05050
Perfluoro-n-tetradecanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-tridecanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-undecanoic acid	1000	0.50	---	---	1	10	0.05000

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.05000
1H,1H,2H,2H-Perfluorodecane sulfonate	.05050
1H,1H,2H,2H-perfluorododecane sulfonate	.04830
1H,1H,2H,2H-Perfluorohexane sulfonate	.05000
1H,1H,2H,2H-Perfluorooctane sulfonate	.05000
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.05000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.05000
3-Perfluoroheptyl propanoic acid	.05000
3-Perfluoropentyl propanoic acid	.05000
3-perfluoropropyl propanoic Acid	.05000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.05000
Adona	.05000
Hexafluoropropylene oxide dimer acid	.05000
N-ethylperfluoro-1-octanesulfonamide	.05000
N-ethylperfluoro-octanesulfonamidoacetic acid	.05000
N-methylperfluoro-1-octanesulfonamide	.05000
N-methylperfluoro-1-octanesulfonamidoacetic acid	.05000
nonafluoro-3,6-dioxaheptanoic acid	.05000
Perfluoro (2-ethoxyethane) sulfonic acid	.04460
Perfluoro-1-butanesulfonate	.05000
Perfluoro-1-decanesulfonate	.05050
Perfluoro-1-dodecanesulfonate	.04850
Perfluoro-1-heptanesulfonate	.05000
Perfluoro-1-hexanesulfonate	.05000
Perfluoro-1-nonanesulfonate	.05050
Perfluoro-1-octanesulfonamide	.05000
Perfluoro-1-octanesulfonate	.05000
perfluoro-1-pentanesulfonate	.05000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ80**

Description: PFAS DoD ICAL Low Stock 1

Perfluoro-3-methoxypropanoic acid	.05000
Perfluoro-4-methoxybutanoic acid	.05000
Perfluoro-n-butanoic Acid	.05000
Perfluoro-n-decanoic Acid	.05000
Perfluoro-n-dodecanoic acid	.05000
Perfluoro-n-heptanoic Acid	.05000
Perfluoro-n-hexadecanoic acid	.05000
Perfluoro-n-hexanoic acid	.05000
Perfluoro-n-octadecanoic acid	.05000
Perfluoro-n-octanoic Acid	.05000
Perfluorononanoic Acid	.05000
Perfluoro-n-pentanoic acid	.05050
Perfluoro-n-tetradecanoic acid	.05000
Perfluoro-n-tridecanoic acid	.05000
Perfluoro-n-undecanoic acid	.05000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LZ79	Pipette	B820865811

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ81

Description: PFAS DoD ICAL Low Stock 2

Stock Id: LZ80

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	2000	0.05	---	---	1	4	0.02500
1H,1H,2H,2H-Perfluorodecane sulfonate	2000	0.05	---	---	1	4	0.02525
1H,1H,2H,2H-perfluorododecane sulfonate	2000	0.05	---	---	1	4	0.02415
1H,1H,2H,2H-Perfluorohexane sulfonate	2000	0.05	---	---	1	4	0.02500
1H,1H,2H,2H-Perfluorooctane sulfonate	2000	0.05	---	---	1	4	0.02500
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	2000	0.05	---	---	1	4	0.02500
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	2000	0.05	---	---	1	4	0.02500
3-Perfluoroheptyl propanoic acid	2000	0.05	---	---	1	4	0.02500
3-Perfluoropentyl propanoic acid	2000	0.05	---	---	1	4	0.02500
3-perfluoropropyl propanoic Acid	2000	0.05	---	---	1	4	0.02500
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	2000	0.05	---	---	1	4	0.02500
Adona	2000	0.05	---	---	1	4	0.02500
Hexafluoropropylene oxide dimer acid	2000	0.05	---	---	1	4	0.02500
N-ethylperfluoro-1-octanesulfonamide	2000	0.05	---	---	1	4	0.02500
N-ethylperfluoro-octanesulfonamidoacetic acid	2000	0.05	---	---	1	4	0.02500
N-methylperfluoro-1-octanesulfonamide	2000	0.05	---	---	1	4	0.02500
N-methylperfluoro-1-octanesulfonamidoacetic acid	2000	0.05	---	---	1	4	0.02500
nonafluoro-3,6-dioxaheptanoic acid	2000	0.05	---	---	1	4	0.02500
Perfluoro (2-ethoxyethane) sulfonic acid	2000	0.04	---	---	1	4	0.02230
Perfluoro-1-butanesulfonate	2000	0.05	---	---	1	4	0.02500
Perfluoro-1-decanesulfonate	2000	0.05	---	---	1	4	0.02525
Perfluoro-1-dodecanesulfonate	2000	0.05	---	---	1	4	0.02425
Perfluoro-1-heptanesulfonate	2000	0.05	---	---	1	4	0.02500
Perfluoro-1-hexanesulfonate	2000	0.05	---	---	1	4	0.02500
Perfluoro-1-nonanesulfonate	2000	0.05	---	---	1	4	0.02525
Perfluoro-1-octanesulfonamide	2000	0.05	---	---	1	4	0.02500
Perfluoro-1-octanesulfonate	2000	0.05	---	---	1	4	0.02500
perfluoro-1-pentanesulfonate	2000	0.05	---	---	1	4	0.02500
Perfluoro-3-methoxypropanoic acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-4-methoxybutanoic acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-butanoic Acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-decanoic Acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-dodecanoic acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-heptanoic Acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-hexadecanoic acid	2000	0.05	---	---	1	4	0.02500

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ81

Description: PFAS DoD ICAL Low Stock 2

Perfluoro-n-hexanoic acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-octadecanoic acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-octanoic Acid	2000	0.05	---	---	1	4	0.02500
Perfluorononanoic Acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-pentanoic acid	2000	0.05	---	---	1	4	0.02525
Perfluoro-n-tetradecanoic acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-tridecanoic acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-undecanoic acid	2000	0.05	---	---	1	4	0.02500

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.02500
1H,1H,2H,2H-Perfluorodecane sulfonate	.02525
1H,1H,2H,2H-perfluorododecane sulfonate	.02415
1H,1H,2H,2H-Perfluorohexane sulfonate	.02500
1H,1H,2H,2H-Perfluorooctane sulfonate	.02500
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.02500
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.02500
3-Perfluoroheptyl propanoic acid	.02500
3-Perfluoropentyl propanoic acid	.02500
3-perfluoropropyl propanoic Acid	.02500
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.02500
Adona	.02500
Hexafluoropropylene oxide dimer acid	.02500
N-ethylperfluoro-1-octanesulfonamide	.02500
N-ethylperfluoro-octanesulfonamidoacetic acid	.02500
N-methylperfluoro-1-octanesulfonamide	.02500
N-methylperfluoro-1-octanesulfonamidoacetic acid	.02500
nonafluoro-3,6-dioxaheptanoic acid	.02500
Perfluoro (2-ethoxyethane) sulfonic acid	.02230
Perfluoro-1-butanesulfonate	.02500
Perfluoro-1-decanesulfonate	.02525
Perfluoro-1-dodecanesulfonate	.02425
Perfluoro-1-heptanesulfonate	.02500
Perfluoro-1-hexanesulfonate	.02500
Perfluoro-1-nonanesulfonate	.02525
Perfluoro-1-octanesulfonamide	.02500
Perfluoro-1-octanesulfonate	.02500
perfluoro-1-pentanesulfonate	.02500

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ81**

Description: PFAS DoD ICAL Low Stock 2

Perfluoro-3-methoxypropanoic acid	.02500
Perfluoro-4-methoxybutanoic acid	.02500
Perfluoro-n-butanoic Acid	.02500
Perfluoro-n-decanoic Acid	.02500
Perfluoro-n-dodecanoic acid	.02500
Perfluoro-n-heptanoic Acid	.02500
Perfluoro-n-hexadecanoic acid	.02500
Perfluoro-n-hexanoic acid	.02500
Perfluoro-n-octadecanoic acid	.02500
Perfluoro-n-octanoic Acid	.02500
Perfluorononanoic Acid	.02500
Perfluoro-n-pentanoic acid	.02525
Perfluoro-n-tetradecanoic acid	.02500
Perfluoro-n-tridecanoic acid	.02500
Perfluoro-n-undecanoic acid	.02500

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LZ80	Pipette	B820865811

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ83

Description: PFAS DoD ICAL L2

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	100	0.50	---	---	1	10	0.00500
d3-MeFOSA	100	0.50	---	---	1	10	0.00500
d5-EtFOSA	100	0.50	---	---	1	10	0.00500
d7-MeFOSE	100	0.50	---	---	1	10	0.00500
d9-EtFOSE	100	0.50	---	---	1	10	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	100	0.50	---	---	1	10	0.00500
13C2-PFTeDA	100	0.50	---	---	1	10	0.00500
13C3-HFPO-DA	100	0.50	---	---	1	10	0.00500
13C3-PFBS	100	0.47	---	---	1	10	0.00466
13C3-PFHxS	100	0.47	---	---	1	10	0.00474
13C4-PFHpA	100	0.50	---	---	1	10	0.00500
13C5-PFHxA	100	0.50	---	---	1	10	0.00500
13C6-PFDA	100	0.50	---	---	1	10	0.00500
13C7-PFUnA	100	0.50	---	---	1	10	0.00500
13C8-PFOA	100	0.50	---	---	1	10	0.00500
13C8-PFOS	100	0.48	---	---	1	10	0.00479
13C9-PFNA	100	0.50	---	---	1	10	0.00500
d3-MeFOSAA	100	0.50	---	---	1	10	0.00500
d5-EtFOSAA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	100	0.50	---	---	1	10	0.00500
13C2-PFOA	100	0.50	---	---	1	10	0.00500
13C3-PFBA	100	0.50	---	---	1	10	0.00500
13C4-PFOS	100	0.48	---	---	1	10	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	100	0.47	---	---	1	10	0.00469
13C2-6:2FTS	100	0.48	---	---	1	10	0.00476
13C2-8:2FTS	100	0.48	---	---	1	10	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ83

Description: PFAS DoD ICAL L2

13C4-PFBA	100	0.50	---	---	1	10	0.00500
13C5-PFPeA	100	0.50	---	---	1	10	0.00500
13C8-FOSA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ81

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	50	0.03	---	---	1	10	0.00013
1H,1H,2H,2H-Perfluorodecane sulfonate	50	0.03	---	---	1	10	0.00013
1H,1H,2H,2H-perfluorododecane sulfonate	50	0.02	---	---	1	10	0.00012
1H,1H,2H,2H-Perfluorohexane sulfonate	50	0.03	---	---	1	10	0.00013
1H,1H,2H,2H-Perfluorooctane sulfonate	50	0.03	---	---	1	10	0.00013
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	50	0.03	---	---	1	10	0.00013
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	50	0.03	---	---	1	10	0.00013
3-Perfluoroheptyl propanoic acid	50	0.03	---	---	1	10	0.00013
3-Perfluoropentyl propanoic acid	50	0.03	---	---	1	10	0.00013
3-perfluoropropyl propanoic Acid	50	0.03	---	---	1	10	0.00013
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	50	0.03	---	---	1	10	0.00013
Adona	50	0.03	---	---	1	10	0.00013
Hexafluoropropylene oxide dimer acid	50	0.03	---	---	1	10	0.00013
N-ethylperfluoro-1-octanesulfonamide	50	0.03	---	---	1	10	0.00013
N-ethylperfluoro-octanesulfonamidoacetic acid	50	0.03	---	---	1	10	0.00013
N-methylperfluoro-1-octanesulfonamide	50	0.03	---	---	1	10	0.00013
N-methylperfluoro-1-octanesulfonamidoacetic acid	50	0.03	---	---	1	10	0.00013
nonafluoro-3,6-dioxaheptanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro (2-ethoxyethane) sulfonic acid	50	0.02	---	---	1	10	0.00011
Perfluoro-1-butanesulfonate	50	0.03	---	---	1	10	0.00013
Perfluoro-1-decanesulfonate	50	0.03	---	---	1	10	0.00013
Perfluoro-1-dodecanesulfonate	50	0.02	---	---	1	10	0.00012
Perfluoro-1-heptanesulfonate	50	0.03	---	---	1	10	0.00013
Perfluoro-1-hexanesulfonate	50	0.03	---	---	1	10	0.00013
Perfluoro-1-nonanesulfonate	50	0.03	---	---	1	10	0.00013
Perfluoro-1-octanesulfonamide	50	0.03	---	---	1	10	0.00013
Perfluoro-1-octanesulfonate	50	0.03	---	---	1	10	0.00013
perfluoro-1-pentanesulfonate	50	0.03	---	---	1	10	0.00013
Perfluoro-3-methoxypropanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro-4-methoxybutanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-butanoic Acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-decanoic Acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-dodecanoic acid	50	0.03	---	---	1	10	0.00013

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ83

Description: PFAS DoD ICAL L2

Perfluoro-n-heptanoic Acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-hexadecanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-hexanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-octadecanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-octanoic Acid	50	0.03	---	---	1	10	0.00013
Perfluorononanoic Acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-pentanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-tetradecanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-tridecanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-undecanoic acid	50	0.03	---	---	1	10	0.00013

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.00013
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.00013
1H,1H,2H,2H-perfluorododecane sulfonate	.00012

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

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It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ83

Description: PFAS DoD ICAL L2

1H,1H,2H,2H-Perfluorohexane sulfonate	.00013
1H,1H,2H,2H-Perfluorooctane sulfonate	.00013
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.00013
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.00013
3-Perfluoroheptyl propanoic acid	.00013
3-Perfluoropentyl propanoic acid	.00013
3-perfluoropropyl propanoic Acid	.00013
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.00013
Adona	.00013
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.00013
N-ethylperfluoro-1-octanesulfonamide	.00013
N-ethylperfluoro-octanesulfonamidoacetic acid	.00013
N-methylperfluoro-1-octanesulfonamide	.00013
N-methylperfluoro-1-octanesulfonamidoacetic acid	.00013
nonafluoro-3,6-dioxaheptanoic acid	.00013
Perfluoro (2-ethoxyethane) sulfonic acid	.00011
Perfluoro-1-butanesulfonate	.00013
Perfluoro-1-decanesulfonate	.00013
Perfluoro-1-dodecanesulfonate	.00012
Perfluoro-1-heptanesulfonate	.00013
Perfluoro-1-hexanesulfonate	.00013
Perfluoro-1-nonanesulfonate	.00013
Perfluoro-1-octanesulfonamide	.00013
Perfluoro-1-octanesulfonate	.00013
perfluoro-1-pentanesulfonate	.00013
Perfluoro-3-methoxypropanoic acid	.00013
Perfluoro-4-methoxybutanoic acid	.00013
Perfluoro-n-butanoic Acid	.00013
Perfluoro-n-decanoic Acid	.00013
Perfluoro-n-dodecanoic acid	.00013
Perfluoro-n-heptanoic Acid	.00013
Perfluoro-n-hexadecanoic acid	.00013
Perfluoro-n-hexanoic acid	.00013

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ83

Description: PFAS DoD ICAL L2

Perfluoro-n-octadecanoic acid	.00013
Perfluoro-n-octanoic Acid	.00013
Perfluorononanoic Acid	.00013
Perfluoro-n-pentanoic acid	.00013
Perfluoro-n-tetradecanoic acid	.00013
Perfluoro-n-tridecanoic acid	.00013
Perfluoro-n-undecanoic acid	.00013

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	C202360925
LX92	Pipette	C202360925
LZ07	Pipette	C202360925
LZ39	Pipette	C202360925
LZ81	Pipette	C202360925

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ84

Description: PFAS DoD ICAL L3

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	400	0.50	---	---	1	40	0.00500
d3-MeFOSA	400	0.50	---	---	1	40	0.00500
d5-EtFOSA	400	0.50	---	---	1	40	0.00500
d7-MeFOSE	400	0.50	---	---	1	40	0.00500
d9-EtFOSE	400	0.50	---	---	1	40	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	400	0.50	---	---	1	40	0.00500
13C2-PFTeDA	400	0.50	---	---	1	40	0.00500
13C3-HFPO-DA	400	0.50	---	---	1	40	0.00500
13C3-PFBS	400	0.47	---	---	1	40	0.00466
13C3-PFHxS	400	0.47	---	---	1	40	0.00474
13C4-PFHpA	400	0.50	---	---	1	40	0.00500
13C5-PFHxA	400	0.50	---	---	1	40	0.00500
13C6-PFDA	400	0.50	---	---	1	40	0.00500
13C7-PFUnA	400	0.50	---	---	1	40	0.00500
13C8-PFOA	400	0.50	---	---	1	40	0.00500
13C8-PFOS	400	0.48	---	---	1	40	0.00479
13C9-PFNA	400	0.50	---	---	1	40	0.00500
d3-MeFOSAA	400	0.50	---	---	1	40	0.00500
d5-EtFOSAA	400	0.50	---	---	1	40	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	400	0.50	---	---	1	40	0.00500
13C2-PFOA	400	0.50	---	---	1	40	0.00500
13C3-PFBA	400	0.50	---	---	1	40	0.00500
13C4-PFOS	400	0.48	---	---	1	40	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	400	0.47	---	---	1	40	0.00469
13C2-6:2FTS	400	0.48	---	---	1	40	0.00476
13C2-8:2FTS	400	0.48	---	---	1	40	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ84

Description: PFAS DoD ICAL L3

13C4-PFBA	400	0.50	---	---	1	40	0.00500
13C5-PFPeA	400	0.50	---	---	1	40	0.00500
13C8-FOSA	400	0.50	---	---	1	40	0.00500

Stock Id: LZ80

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	200	0.05	---	---	1	40	0.00025
1H,1H,2H,2H-Perfluorodecane sulfonate	200	0.05	---	---	1	40	0.00025
1H,1H,2H,2H-perfluorododecane sulfonate	200	0.05	---	---	1	40	0.00024
1H,1H,2H,2H-Perfluorohexane sulfonate	200	0.05	---	---	1	40	0.00025
1H,1H,2H,2H-Perfluorooctane sulfonate	200	0.05	---	---	1	40	0.00025
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	200	0.05	---	---	1	40	0.00025
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	200	0.05	---	---	1	40	0.00025
3-Perfluoroheptyl propanoic acid	200	0.05	---	---	1	40	0.00025
3-Perfluoropentyl propanoic acid	200	0.05	---	---	1	40	0.00025
3-perfluoropropyl propanoic Acid	200	0.05	---	---	1	40	0.00025
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	200	0.05	---	---	1	40	0.00025
Adona	200	0.05	---	---	1	40	0.00025
Hexafluoropropylene oxide dimer acid	200	0.05	---	---	1	40	0.00025
N-ethylperfluoro-1-octanesulfonamide	200	0.05	---	---	1	40	0.00025
N-ethylperfluoro-octanesulfonamidoacetic acid	200	0.05	---	---	1	40	0.00025
N-methylperfluoro-1-octanesulfonamide	200	0.05	---	---	1	40	0.00025
N-methylperfluoro-1-octanesulfonamidoacetic acid	200	0.05	---	---	1	40	0.00025
nonafluoro-3,6-dioxaheptanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro (2-ethoxyethane) sulfonic acid	200	0.04	---	---	1	40	0.00022
Perfluoro-1-butanesulfonate	200	0.05	---	---	1	40	0.00025
Perfluoro-1-decanesulfonate	200	0.05	---	---	1	40	0.00025
Perfluoro-1-dodecanesulfonate	200	0.05	---	---	1	40	0.00024
Perfluoro-1-heptanesulfonate	200	0.05	---	---	1	40	0.00025
Perfluoro-1-hexanesulfonate	200	0.05	---	---	1	40	0.00025
Perfluoro-1-nonanesulfonate	200	0.05	---	---	1	40	0.00025
Perfluoro-1-octanesulfonamide	200	0.05	---	---	1	40	0.00025
Perfluoro-1-octanesulfonate	200	0.05	---	---	1	40	0.00025
perfluoro-1-pentanesulfonate	200	0.05	---	---	1	40	0.00025
Perfluoro-3-methoxypropanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro-4-methoxybutanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-butanoic Acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-decanoic Acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-dodecanoic acid	200	0.05	---	---	1	40	0.00025

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ84

Description: PFAS DoD ICAL L3

Perfluoro-n-heptanoic Acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-hexadecanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-hexanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-octadecanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-octanoic Acid	200	0.05	---	---	1	40	0.00025
Perfluorononanoic Acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-pentanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-tetradecanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-tridecanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-undecanoic acid	200	0.05	---	---	1	40	0.00025

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.00025
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.00025
1H,1H,2H,2H-perfluorododecane sulfonate	.00024

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ84

Description: PFAS DoD ICAL L3

1H,1H,2H,2H-Perfluorohexane sulfonate	.00025
1H,1H,2H,2H-Perfluorooctane sulfonate	.00025
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.00025
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.00025
3-Perfluoroheptyl propanoic acid	.00025
3-Perfluoropentyl propanoic acid	.00025
3-perfluoropropyl propanoic Acid	.00025
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.00025
Adona	.00025
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.00025
N-ethylperfluoro-1-octanesulfonamide	.00025
N-ethylperfluoro-octanesulfonamidoacetic acid	.00025
N-methylperfluoro-1-octanesulfonamide	.00025
N-methylperfluoro-1-octanesulfonamidoacetic acid	.00025
nonafluoro-3,6-dioxaheptanoic acid	.00025
Perfluoro (2-ethoxyethane) sulfonic acid	.00022
Perfluoro-1-butanesulfonate	.00025
Perfluoro-1-decanesulfonate	.00025
Perfluoro-1-dodecanesulfonate	.00024
Perfluoro-1-heptanesulfonate	.00025
Perfluoro-1-hexanesulfonate	.00025
Perfluoro-1-nonanesulfonate	.00025
Perfluoro-1-octanesulfonamide	.00025
Perfluoro-1-octanesulfonate	.00025
perfluoro-1-pentanesulfonate	.00025
Perfluoro-3-methoxypropanoic acid	.00025
Perfluoro-4-methoxybutanoic acid	.00025
Perfluoro-n-butanoic Acid	.00025
Perfluoro-n-decanoic Acid	.00025
Perfluoro-n-dodecanoic acid	.00025
Perfluoro-n-heptanoic Acid	.00025
Perfluoro-n-hexadecanoic acid	.00025
Perfluoro-n-hexanoic acid	.00025

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ84**

Description: PFAS DoD ICAL L3

Perfluoro-n-octadecanoic acid	.00025
Perfluoro-n-octanoic Acid	.00025
Perfluorononanoic Acid	.00025
Perfluoro-n-pentanoic acid	.00025
Perfluoro-n-tetradecanoic acid	.00025
Perfluoro-n-tridecanoic acid	.00025
Perfluoro-n-undecanoic acid	.00025

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	B820865811
LX92	Pipette	B820865811
LZ07	Pipette	B820865811
LZ39	Pipette	B820865811
LZ80	Pipette	B814657482

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ85

Description: PFAS DoD ICAL L4

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	100	0.50	---	---	1	10	0.00500
d3-MeFOSA	100	0.50	---	---	1	10	0.00500
d5-EtFOSA	100	0.50	---	---	1	10	0.00500
d7-MeFOSE	100	0.50	---	---	1	10	0.00500
d9-EtFOSE	100	0.50	---	---	1	10	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	100	0.50	---	---	1	10	0.00500
13C2-PFTeDA	100	0.50	---	---	1	10	0.00500
13C3-HFPO-DA	100	0.50	---	---	1	10	0.00500
13C3-PFBS	100	0.47	---	---	1	10	0.00466
13C3-PFHxS	100	0.47	---	---	1	10	0.00474
13C4-PFHpA	100	0.50	---	---	1	10	0.00500
13C5-PFHxA	100	0.50	---	---	1	10	0.00500
13C6-PFDA	100	0.50	---	---	1	10	0.00500
13C7-PFUnA	100	0.50	---	---	1	10	0.00500
13C8-PFOA	100	0.50	---	---	1	10	0.00500
13C8-PFOS	100	0.48	---	---	1	10	0.00479
13C9-PFNA	100	0.50	---	---	1	10	0.00500
d3-MeFOSAA	100	0.50	---	---	1	10	0.00500
d5-EtFOSAA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	100	0.50	---	---	1	10	0.00500
13C2-PFOA	100	0.50	---	---	1	10	0.00500
13C3-PFBA	100	0.50	---	---	1	10	0.00500
13C4-PFOS	100	0.48	---	---	1	10	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	100	0.47	---	---	1	10	0.00469
13C2-6:2FTS	100	0.48	---	---	1	10	0.00476
13C2-8:2FTS	100	0.48	---	---	1	10	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ85

Description: PFAS DoD ICAL L4

13C4-PFBA	100	0.50	---	---	1	10	0.00500
13C5-PFPeA	100	0.50	---	---	1	10	0.00500
13C8-FOSA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ80

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	100	0.05	---	---	1	10	0.00050
1H,1H,2H,2H-Perfluorodecane sulfonate	100	0.05	---	---	1	10	0.00051
1H,1H,2H,2H-perfluorododecane sulfonate	100	0.05	---	---	1	10	0.00048
1H,1H,2H,2H-Perfluorohexane sulfonate	100	0.05	---	---	1	10	0.00050
1H,1H,2H,2H-Perfluorooctane sulfonate	100	0.05	---	---	1	10	0.00050
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	100	0.05	---	---	1	10	0.00050
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	100	0.05	---	---	1	10	0.00050
3-Perfluoroheptyl propanoic acid	100	0.05	---	---	1	10	0.00050
3-Perfluoropentyl propanoic acid	100	0.05	---	---	1	10	0.00050
3-perfluoropropyl propanoic Acid	100	0.05	---	---	1	10	0.00050
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	100	0.05	---	---	1	10	0.00050
Adona	100	0.05	---	---	1	10	0.00050
Hexafluoropropylene oxide dimer acid	100	0.05	---	---	1	10	0.00050
N-ethylperfluoro-1-octanesulfonamide	100	0.05	---	---	1	10	0.00050
N-ethylperfluoro-octanesulfonamidoacetic acid	100	0.05	---	---	1	10	0.00050
N-methylperfluoro-1-octanesulfonamide	100	0.05	---	---	1	10	0.00050
N-methylperfluoro-1-octanesulfonamidoacetic acid	100	0.05	---	---	1	10	0.00050
nonafluoro-3,6-dioxaheptanoic acid	100	0.05	---	---	1	10	0.00050
Perfluoro (2-ethoxyethane) sulfonic acid	100	0.04	---	---	1	10	0.00045
Perfluoro-1-butanesulfonate	100	0.05	---	---	1	10	0.00050
Perfluoro-1-decanesulfonate	100	0.05	---	---	1	10	0.00051
Perfluoro-1-dodecanesulfonate	100	0.05	---	---	1	10	0.00049
Perfluoro-1-heptanesulfonate	100	0.05	---	---	1	10	0.00050
Perfluoro-1-hexanesulfonate	100	0.05	---	---	1	10	0.00050
Perfluoro-1-nonanesulfonate	100	0.05	---	---	1	10	0.00051
Perfluoro-1-octanesulfonamide	100	0.05	---	---	1	10	0.00050
Perfluoro-1-octanesulfonate	100	0.05	---	---	1	10	0.00050
perfluoro-1-pentanesulfonate	100	0.05	---	---	1	10	0.00050
Perfluoro-3-methoxypropanoic acid	100	0.05	---	---	1	10	0.00050
Perfluoro-4-methoxybutanoic acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-butanoic Acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-decanoic Acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-dodecanoic acid	100	0.05	---	---	1	10	0.00050

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ85

Description: PFAS DoD ICAL L4

Perfluoro-n-heptanoic Acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-hexadecanoic acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-hexanoic acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-octadecanoic acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-octanoic Acid	100	0.05	---	---	1	10	0.00050
Perfluorononanoic Acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-pentanoic acid	100	0.05	---	---	1	10	0.00051
Perfluoro-n-tetradecanoic acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-tridecanoic acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-undecanoic acid	100	0.05	---	---	1	10	0.00050

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.00050
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.00051
1H,1H,2H,2H-perfluorododecane sulfonate	.00048

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ85

Description: PFAS DoD ICAL L4

1H,1H,2H,2H-Perfluorohexane sulfonate	.00050
1H,1H,2H,2H-Perfluorooctane sulfonate	.00050
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.00050
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.00050
3-Perfluoroheptyl propanoic acid	.00050
3-Perfluoropentyl propanoic acid	.00050
3-perfluoropropyl propanoic Acid	.00050
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.00050
Adona	.00050
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.00050
N-ethylperfluoro-1-octanesulfonamide	.00050
N-ethylperfluoro-octanesulfonamidoacetic acid	.00050
N-methylperfluoro-1-octanesulfonamide	.00050
N-methylperfluoro-1-octanesulfonamidoacetic acid	.00050
nonafluoro-3,6-dioxaheptanoic acid	.00050
Perfluoro (2-ethoxyethane) sulfonic acid	.00045
Perfluoro-1-butanesulfonate	.00050
Perfluoro-1-decanesulfonate	.00051
Perfluoro-1-dodecanesulfonate	.00049
Perfluoro-1-heptanesulfonate	.00050
Perfluoro-1-hexanesulfonate	.00050
Perfluoro-1-nonanesulfonate	.00051
Perfluoro-1-octanesulfonamide	.00050
Perfluoro-1-octanesulfonate	.00050
perfluoro-1-pentanesulfonate	.00050
Perfluoro-3-methoxypropanoic acid	.00050
Perfluoro-4-methoxybutanoic acid	.00050
Perfluoro-n-butanoic Acid	.00050
Perfluoro-n-decanoic Acid	.00050
Perfluoro-n-dodecanoic acid	.00050
Perfluoro-n-heptanoic Acid	.00050
Perfluoro-n-hexadecanoic acid	.00050
Perfluoro-n-hexanoic acid	.00050

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ85**

Description: PFAS DoD ICAL L4

Perfluoro-n-octadecanoic acid	.00050
Perfluoro-n-octanoic Acid	.00050
Perfluorononanoic Acid	.00050
Perfluoro-n-pentanoic acid	.00051
Perfluoro-n-tetradecanoic acid	.00050
Perfluoro-n-tridecanoic acid	.00050
Perfluoro-n-undecanoic acid	.00050

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	C202360925
LX92	Pipette	C202360925
LZ07	Pipette	C202360925
LZ39	Pipette	C202360925
LZ80	Pipette	C202360925

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ86

Description: PFAS DoD ICAL L5

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	400	0.50	---	---	1	40	0.00500
d3-MeFOSA	400	0.50	---	---	1	40	0.00500
d5-EtFOSA	400	0.50	---	---	1	40	0.00500
d7-MeFOSE	400	0.50	---	---	1	40	0.00500
d9-EtFOSE	400	0.50	---	---	1	40	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	400	0.50	---	---	1	40	0.00500
13C2-PFTeDA	400	0.50	---	---	1	40	0.00500
13C3-HFPO-DA	400	0.50	---	---	1	40	0.00500
13C3-PFBS	400	0.47	---	---	1	40	0.00466
13C3-PFHxS	400	0.47	---	---	1	40	0.00474
13C4-PFHpA	400	0.50	---	---	1	40	0.00500
13C5-PFHxA	400	0.50	---	---	1	40	0.00500
13C6-PFDA	400	0.50	---	---	1	40	0.00500
13C7-PFUnA	400	0.50	---	---	1	40	0.00500
13C8-PFOA	400	0.50	---	---	1	40	0.00500
13C8-PFOS	400	0.48	---	---	1	40	0.00479
13C9-PFNA	400	0.50	---	---	1	40	0.00500
d3-MeFOSAA	400	0.50	---	---	1	40	0.00500
d5-EtFOSAA	400	0.50	---	---	1	40	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	400	0.50	---	---	1	40	0.00500
13C2-PFOA	400	0.50	---	---	1	40	0.00500
13C3-PFBA	400	0.50	---	---	1	40	0.00500
13C4-PFOS	400	0.48	---	---	1	40	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	400	0.47	---	---	1	40	0.00469
13C2-6:2FTS	400	0.48	---	---	1	40	0.00476
13C2-8:2FTS	400	0.48	---	---	1	40	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ86

Description: PFAS DoD ICAL L5

13C4-PFBA	400	0.50	---	---	1	40	0.00500
13C5-PFPeA	400	0.50	---	---	1	40	0.00500
13C8-FOSA	400	0.50	---	---	1	40	0.00500

Stock Id: LZ80

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	800	0.05	---	---	1	40	0.00100
1H,1H,2H,2H-Perfluorodecane sulfonate	800	0.05	---	---	1	40	0.00101
1H,1H,2H,2H-perfluorododecane sulfonate	800	0.05	---	---	1	40	0.00097
1H,1H,2H,2H-Perfluorohexane sulfonate	800	0.05	---	---	1	40	0.00100
1H,1H,2H,2H-Perfluorooctane sulfonate	800	0.05	---	---	1	40	0.00100
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	800	0.05	---	---	1	40	0.00100
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	800	0.05	---	---	1	40	0.00100
3-Perfluoroheptyl propanoic acid	800	0.05	---	---	1	40	0.00100
3-Perfluoropentyl propanoic acid	800	0.05	---	---	1	40	0.00100
3-perfluoropropyl propanoic Acid	800	0.05	---	---	1	40	0.00100
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	800	0.05	---	---	1	40	0.00100
Adona	800	0.05	---	---	1	40	0.00100
Hexafluoropropylene oxide dimer acid	800	0.05	---	---	1	40	0.00100
N-ethylperfluoro-1-octanesulfonamide	800	0.05	---	---	1	40	0.00100
N-ethylperfluoro-octanesulfonamidoacetic acid	800	0.05	---	---	1	40	0.00100
N-methylperfluoro-1-octanesulfonamide	800	0.05	---	---	1	40	0.00100
N-methylperfluoro-1-octanesulfonamidoacetic acid	800	0.05	---	---	1	40	0.00100
nonafluoro-3,6-dioxaheptanoic acid	800	0.05	---	---	1	40	0.00100
Perfluoro (2-ethoxyethane) sulfonic acid	800	0.04	---	---	1	40	0.00089
Perfluoro-1-butanesulfonate	800	0.05	---	---	1	40	0.00100
Perfluoro-1-decanesulfonate	800	0.05	---	---	1	40	0.00101
Perfluoro-1-dodecanesulfonate	800	0.05	---	---	1	40	0.00097
Perfluoro-1-heptanesulfonate	800	0.05	---	---	1	40	0.00100
Perfluoro-1-hexanesulfonate	800	0.05	---	---	1	40	0.00100
Perfluoro-1-nonanesulfonate	800	0.05	---	---	1	40	0.00101
Perfluoro-1-octanesulfonamide	800	0.05	---	---	1	40	0.00100
Perfluoro-1-octanesulfonate	800	0.05	---	---	1	40	0.00100
perfluoro-1-pentanesulfonate	800	0.05	---	---	1	40	0.00100
Perfluoro-3-methoxypropanoic acid	800	0.05	---	---	1	40	0.00100
Perfluoro-4-methoxybutanoic acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-butanoic Acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-decanoic Acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-dodecanoic acid	800	0.05	---	---	1	40	0.00100

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ86

Description: PFAS DoD ICAL L5

Perfluoro-n-heptanoic Acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-hexadecanoic acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-hexanoic acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-octadecanoic acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-octanoic Acid	800	0.05	---	---	1	40	0.00100
Perfluorononanoic Acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-pentanoic acid	800	0.05	---	---	1	40	0.00101
Perfluoro-n-tetradecanoic acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-tridecanoic acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-undecanoic acid	800	0.05	---	---	1	40	0.00100

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.00100
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.00101
1H,1H,2H,2H-perfluorododecane sulfonate	.00097

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ86

Description: PFAS DoD ICAL L5

1H,1H,2H,2H-Perfluorohexane sulfonate	.00100
1H,1H,2H,2H-Perfluorooctane sulfonate	.00100
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.00100
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.00100
3-Perfluoroheptyl propanoic acid	.00100
3-Perfluoropentyl propanoic acid	.00100
3-perfluoropropyl propanoic Acid	.00100
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.00100
Adona	.00100
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.00100
N-ethylperfluoro-1-octanesulfonamide	.00100
N-ethylperfluoro-octanesulfonamidoacetic acid	.00100
N-methylperfluoro-1-octanesulfonamide	.00100
N-methylperfluoro-1-octanesulfonamidoacetic acid	.00100
nonafluoro-3,6-dioxaheptanoic acid	.00100
Perfluoro (2-ethoxyethane) sulfonic acid	.00089
Perfluoro-1-butanesulfonate	.00100
Perfluoro-1-decanesulfonate	.00101
Perfluoro-1-dodecanesulfonate	.00097
Perfluoro-1-heptanesulfonate	.00100
Perfluoro-1-hexanesulfonate	.00100
Perfluoro-1-nonanesulfonate	.00101
Perfluoro-1-octanesulfonamide	.00100
Perfluoro-1-octanesulfonate	.00100
perfluoro-1-pentanesulfonate	.00100
Perfluoro-3-methoxypropanoic acid	.00100
Perfluoro-4-methoxybutanoic acid	.00100
Perfluoro-n-butanoic Acid	.00100
Perfluoro-n-decanoic Acid	.00100
Perfluoro-n-dodecanoic acid	.00100
Perfluoro-n-heptanoic Acid	.00100
Perfluoro-n-hexadecanoic acid	.00100
Perfluoro-n-hexanoic acid	.00100

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ86**

Description: PFAS DoD ICAL L5

Perfluoro-n-octadecanoic acid	.00100
Perfluoro-n-octanoic Acid	.00100
Perfluorononanoic Acid	.00100
Perfluoro-n-pentanoic acid	.00101
Perfluoro-n-tetradecanoic acid	.00100
Perfluoro-n-tridecanoic acid	.00100
Perfluoro-n-undecanoic acid	.00100

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	B820865811
LX92	Pipette	B820865811
LZ07	Pipette	B820865811
LZ39	Pipette	B820865811
LZ80	Pipette	B820865811

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ87

Description: PFAS DoD ICAL L6

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	400	0.50	---	---	1	40	0.00500
d3-MeFOSA	400	0.50	---	---	1	40	0.00500
d5-EtFOSA	400	0.50	---	---	1	40	0.00500
d7-MeFOSE	400	0.50	---	---	1	40	0.00500
d9-EtFOSE	400	0.50	---	---	1	40	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	400	0.50	---	---	1	40	0.00500
13C2-PFTeDA	400	0.50	---	---	1	40	0.00500
13C3-HFPO-DA	400	0.50	---	---	1	40	0.00500
13C3-PFBS	400	0.47	---	---	1	40	0.00466
13C3-PFHxS	400	0.47	---	---	1	40	0.00474
13C4-PFHpA	400	0.50	---	---	1	40	0.00500
13C5-PFHxA	400	0.50	---	---	1	40	0.00500
13C6-PFDA	400	0.50	---	---	1	40	0.00500
13C7-PFUnA	400	0.50	---	---	1	40	0.00500
13C8-PFOA	400	0.50	---	---	1	40	0.00500
13C8-PFOS	400	0.48	---	---	1	40	0.00479
13C9-PFNA	400	0.50	---	---	1	40	0.00500
d3-MeFOSAA	400	0.50	---	---	1	40	0.00500
d5-EtFOSAA	400	0.50	---	---	1	40	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	400	0.50	---	---	1	40	0.00500
13C2-PFOA	400	0.50	---	---	1	40	0.00500
13C3-PFBA	400	0.50	---	---	1	40	0.00500
13C4-PFOS	400	0.48	---	---	1	40	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	400	0.47	---	---	1	40	0.00469
13C2-6:2FTS	400	0.48	---	---	1	40	0.00476
13C2-8:2FTS	400	0.48	---	---	1	40	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ87

Description: PFAS DoD ICAL L6

13C4-PFBA	400	0.50	---	---	1	40	0.00500
13C5-PFPeA	400	0.50	---	---	1	40	0.00500
13C8-FOSA	400	0.50	---	---	1	40	0.00500

Stock Id: LZ79

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	200	0.50	---	---	1	40	0.00250
1H,1H,2H,2H-Perfluorodecane sulfonate	200	0.51	---	---	1	40	0.00253
1H,1H,2H,2H-perfluorododecane sulfonate	200	0.48	---	---	1	40	0.00242
1H,1H,2H,2H-Perfluorohexane sulfonate	200	0.50	---	---	1	40	0.00250
1H,1H,2H,2H-Perfluorooctane sulfonate	200	0.50	---	---	1	40	0.00250
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	200	0.50	---	---	1	40	0.00250
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	200	0.50	---	---	1	40	0.00250
3-Perfluoroheptyl propanoic acid	200	0.50	---	---	1	40	0.00250
3-Perfluoropentyl propanoic acid	200	0.50	---	---	1	40	0.00250
3-perfluoropropyl propanoic Acid	200	0.50	---	---	1	40	0.00250
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	200	0.50	---	---	1	40	0.00250
Adona	200	0.50	---	---	1	40	0.00250
Hexafluoropropylene oxide dimer acid	200	0.50	---	---	1	40	0.00250
N-ethylperfluoro-1-octanesulfonamide	200	0.50	---	---	1	40	0.00250
N-ethylperfluoro-octanesulfonamidoacetic acid	200	0.50	---	---	1	40	0.00250
N-methylperfluoro-1-octanesulfonamide	200	0.50	---	---	1	40	0.00250
N-methylperfluoro-1-octanesulfonamidoacetic acid	200	0.50	---	---	1	40	0.00250
nonafluoro-3,6-dioxaheptanoic acid	200	0.50	---	---	1	40	0.00250
Perfluoro (2-ethoxyethane) sulfonic acid	200	0.45	---	---	1	40	0.00223
Perfluoro-1-butanesulfonate	200	0.50	---	---	1	40	0.00250
Perfluoro-1-decanesulfonate	200	0.51	---	---	1	40	0.00253
Perfluoro-1-dodecanesulfonate	200	0.49	---	---	1	40	0.00243
Perfluoro-1-heptanesulfonate	200	0.50	---	---	1	40	0.00250
Perfluoro-1-hexanesulfonate	200	0.50	---	---	1	40	0.00250
Perfluoro-1-nonanesulfonate	200	0.51	---	---	1	40	0.00253
Perfluoro-1-octanesulfonamide	200	0.50	---	---	1	40	0.00250
Perfluoro-1-octanesulfonate	200	0.50	---	---	1	40	0.00250
perfluoro-1-pentanesulfonate	200	0.50	---	---	1	40	0.00250
Perfluoro-3-methoxypropanoic acid	200	0.50	---	---	1	40	0.00250
Perfluoro-4-methoxybutanoic acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-butanoic Acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-decanoic Acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-dodecanoic acid	200	0.50	---	---	1	40	0.00250

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ87

Description: PFAS DoD ICAL L6

Perfluoro-n-heptanoic Acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-hexadecanoic acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-hexanoic acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-octadecanoic acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-octanoic Acid	200	0.50	---	---	1	40	0.00250
Perfluorononanoic Acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-pentanoic acid	200	0.51	---	---	1	40	0.00253
Perfluoro-n-tetradecanoic acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-tridecanoic acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-undecanoic acid	200	0.50	---	---	1	40	0.00250

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.00250
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.00253
1H,1H,2H,2H-perfluorododecane sulfonate	.00242

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ87

Description: PFAS DoD ICAL L6

1H,1H,2H,2H-Perfluorohexane sulfonate	.00250
1H,1H,2H,2H-Perfluorooctane sulfonate	.00250
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.00250
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.00250
3-Perfluoroheptyl propanoic acid	.00250
3-Perfluoropentyl propanoic acid	.00250
3-perfluoropropyl propanoic Acid	.00250
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.00250
Adona	.00250
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.00250
N-ethylperfluoro-1-octanesulfonamide	.00250
N-ethylperfluoro-octanesulfonamidoacetic acid	.00250
N-methylperfluoro-1-octanesulfonamide	.00250
N-methylperfluoro-1-octanesulfonamidoacetic acid	.00250
nonafluoro-3,6-dioxaheptanoic acid	.00250
Perfluoro (2-ethoxyethane) sulfonic acid	.00223
Perfluoro-1-butanesulfonate	.00250
Perfluoro-1-decanesulfonate	.00253
Perfluoro-1-dodecanesulfonate	.00243
Perfluoro-1-heptanesulfonate	.00250
Perfluoro-1-hexanesulfonate	.00250
Perfluoro-1-nonanesulfonate	.00253
Perfluoro-1-octanesulfonamide	.00250
Perfluoro-1-octanesulfonate	.00250
perfluoro-1-pentanesulfonate	.00250
Perfluoro-3-methoxypropanoic acid	.00250
Perfluoro-4-methoxybutanoic acid	.00250
Perfluoro-n-butanoic Acid	.00250
Perfluoro-n-decanoic Acid	.00250
Perfluoro-n-dodecanoic acid	.00250
Perfluoro-n-heptanoic Acid	.00250
Perfluoro-n-hexadecanoic acid	.00250
Perfluoro-n-hexanoic acid	.00250

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ87**

Description: PFAS DoD ICAL L6

Perfluoro-n-octadecanoic acid	.00250
Perfluoro-n-octanoic Acid	.00250
Perfluorononanoic Acid	.00250
Perfluoro-n-pentanoic acid	.00253
Perfluoro-n-tetradecanoic acid	.00250
Perfluoro-n-tridecanoic acid	.00250
Perfluoro-n-undecanoic acid	.00250

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	B820865811
LX92	Pipette	B820865811
LZ07	Pipette	B820865811
LZ39	Pipette	B820865811
LZ79	Pipette	B814657482

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ88

Description: PFAS DoD ICAL L7

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	100	0.50	---	---	1	10	0.00500
d3-MeFOSA	100	0.50	---	---	1	10	0.00500
d5-EtFOSA	100	0.50	---	---	1	10	0.00500
d7-MeFOSE	100	0.50	---	---	1	10	0.00500
d9-EtFOSE	100	0.50	---	---	1	10	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	100	0.50	---	---	1	10	0.00500
13C2-PFTeDA	100	0.50	---	---	1	10	0.00500
13C3-HFPO-DA	100	0.50	---	---	1	10	0.00500
13C3-PFBS	100	0.47	---	---	1	10	0.00466
13C3-PFHxS	100	0.47	---	---	1	10	0.00474
13C4-PFHpA	100	0.50	---	---	1	10	0.00500
13C5-PFHxA	100	0.50	---	---	1	10	0.00500
13C6-PFDA	100	0.50	---	---	1	10	0.00500
13C7-PFUnA	100	0.50	---	---	1	10	0.00500
13C8-PFOA	100	0.50	---	---	1	10	0.00500
13C8-PFOS	100	0.48	---	---	1	10	0.00479
13C9-PFNA	100	0.50	---	---	1	10	0.00500
d3-MeFOSAA	100	0.50	---	---	1	10	0.00500
d5-EtFOSAA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	100	0.50	---	---	1	10	0.00500
13C2-PFOA	100	0.50	---	---	1	10	0.00500
13C3-PFBA	100	0.50	---	---	1	10	0.00500
13C4-PFOS	100	0.48	---	---	1	10	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	100	0.47	---	---	1	10	0.00469
13C2-6:2FTS	100	0.48	---	---	1	10	0.00476
13C2-8:2FTS	100	0.48	---	---	1	10	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ88

Description: PFAS DoD ICAL L7

13C4-PFBA	100	0.50	---	---	1	10	0.00500
13C5-PFPeA	100	0.50	---	---	1	10	0.00500
13C8-FOSA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ79

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	200	0.50	---	---	1	10	0.01000
1H,1H,2H,2H-Perfluorodecane sulfonate	200	0.51	---	---	1	10	0.01010
1H,1H,2H,2H-perfluorododecane sulfonate	200	0.48	---	---	1	10	0.00966
1H,1H,2H,2H-Perfluorohexane sulfonate	200	0.50	---	---	1	10	0.01000
1H,1H,2H,2H-Perfluorooctane sulfonate	200	0.50	---	---	1	10	0.01000
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	200	0.50	---	---	1	10	0.01000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	200	0.50	---	---	1	10	0.01000
3-Perfluoroheptyl propanoic acid	200	0.50	---	---	1	10	0.01000
3-Perfluoropentyl propanoic acid	200	0.50	---	---	1	10	0.01000
3-perfluoropropyl propanoic Acid	200	0.50	---	---	1	10	0.01000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	200	0.50	---	---	1	10	0.01000
Adona	200	0.50	---	---	1	10	0.01000
Hexafluoropropylene oxide dimer acid	200	0.50	---	---	1	10	0.01000
N-ethylperfluoro-1-octanesulfonamide	200	0.50	---	---	1	10	0.01000
N-ethylperfluoro-octanesulfonamidoacetic acid	200	0.50	---	---	1	10	0.01000
N-methylperfluoro-1-octanesulfonamide	200	0.50	---	---	1	10	0.01000
N-methylperfluoro-1-octanesulfonamidoacetic acid	200	0.50	---	---	1	10	0.01000
nonafluoro-3,6-dioxaheptanoic acid	200	0.50	---	---	1	10	0.01000
Perfluoro (2-ethoxyethane) sulfonic acid	200	0.45	---	---	1	10	0.00892
Perfluoro-1-butanesulfonate	200	0.50	---	---	1	10	0.01000
Perfluoro-1-decanesulfonate	200	0.51	---	---	1	10	0.01010
Perfluoro-1-dodecanesulfonate	200	0.49	---	---	1	10	0.00970
Perfluoro-1-heptanesulfonate	200	0.50	---	---	1	10	0.01000
Perfluoro-1-hexanesulfonate	200	0.50	---	---	1	10	0.01000
Perfluoro-1-nonanesulfonate	200	0.51	---	---	1	10	0.01010
Perfluoro-1-octanesulfonamide	200	0.50	---	---	1	10	0.01000
Perfluoro-1-octanesulfonate	200	0.50	---	---	1	10	0.01000
perfluoro-1-pentanesulfonate	200	0.50	---	---	1	10	0.01000
Perfluoro-3-methoxypropanoic acid	200	0.50	---	---	1	10	0.01000
Perfluoro-4-methoxybutanoic acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-butanoic Acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-decanoic Acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-dodecanoic acid	200	0.50	---	---	1	10	0.01000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ88

Description: PFAS DoD ICAL L7

Perfluoro-n-heptanoic Acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-hexadecanoic acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-hexanoic acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-octadecanoic acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-octanoic Acid	200	0.50	---	---	1	10	0.01000
Perfluorononanoic Acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-pentanoic acid	200	0.51	---	---	1	10	0.01010
Perfluoro-n-tetradecanoic acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-tridecanoic acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-undecanoic acid	200	0.50	---	---	1	10	0.01000

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.01000
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.01010
1H,1H,2H,2H-perfluorododecane sulfonate	.00966

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ88

Description: PFAS DoD ICAL L7

1H,1H,2H,2H-Perfluorohexane sulfonate	.01000
1H,1H,2H,2H-Perfluorooctane sulfonate	.01000
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.01000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.01000
3-Perfluoroheptyl propanoic acid	.01000
3-Perfluoropentyl propanoic acid	.01000
3-perfluoropropyl propanoic Acid	.01000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.01000
Adona	.01000
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.01000
N-ethylperfluoro-1-octanesulfonamide	.01000
N-ethylperfluoro-octanesulfonamidoacetic acid	.01000
N-methylperfluoro-1-octanesulfonamide	.01000
N-methylperfluoro-1-octanesulfonamidoacetic acid	.01000
nonafluoro-3,6-dioxaheptanoic acid	.01000
Perfluoro (2-ethoxyethane) sulfonic acid	.00892
Perfluoro-1-butanesulfonate	.01000
Perfluoro-1-decanesulfonate	.01010
Perfluoro-1-dodecanesulfonate	.00970
Perfluoro-1-heptanesulfonate	.01000
Perfluoro-1-hexanesulfonate	.01000
Perfluoro-1-nonanesulfonate	.01010
Perfluoro-1-octanesulfonamide	.01000
Perfluoro-1-octanesulfonate	.01000
perfluoro-1-pentanesulfonate	.01000
Perfluoro-3-methoxypropanoic acid	.01000
Perfluoro-4-methoxybutanoic acid	.01000
Perfluoro-n-butanoic Acid	.01000
Perfluoro-n-decanoic Acid	.01000
Perfluoro-n-dodecanoic acid	.01000
Perfluoro-n-heptanoic Acid	.01000
Perfluoro-n-hexadecanoic acid	.01000
Perfluoro-n-hexanoic acid	.01000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ88**

Description: PFAS DoD ICAL L7

Perfluoro-n-octadecanoic acid	.01000
Perfluoro-n-octanoic Acid	.01000
Perfluorononanoic Acid	.01000
Perfluoro-n-pentanoic acid	.01010
Perfluoro-n-tetradecanoic acid	.01000
Perfluoro-n-tridecanoic acid	.01000
Perfluoro-n-undecanoic acid	.01000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	C202360925
LX92	Pipette	C202360925
LZ07	Pipette	C202360925
LZ39	Pipette	C202360925
LZ79	Pipette	B814657482

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ89

Description: PFAS DoD ICAL L8

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	100	0.50	---	---	1	10	0.00500
d3-MeFOSA	100	0.50	---	---	1	10	0.00500
d5-EtFOSA	100	0.50	---	---	1	10	0.00500
d7-MeFOSE	100	0.50	---	---	1	10	0.00500
d9-EtFOSE	100	0.50	---	---	1	10	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	100	0.50	---	---	1	10	0.00500
13C2-PFTeDA	100	0.50	---	---	1	10	0.00500
13C3-HFPO-DA	100	0.50	---	---	1	10	0.00500
13C3-PFBS	100	0.47	---	---	1	10	0.00466
13C3-PFHxS	100	0.47	---	---	1	10	0.00474
13C4-PFHpA	100	0.50	---	---	1	10	0.00500
13C5-PFHxA	100	0.50	---	---	1	10	0.00500
13C6-PFDA	100	0.50	---	---	1	10	0.00500
13C7-PFUnA	100	0.50	---	---	1	10	0.00500
13C8-PFOA	100	0.50	---	---	1	10	0.00500
13C8-PFOS	100	0.48	---	---	1	10	0.00479
13C9-PFNA	100	0.50	---	---	1	10	0.00500
d3-MeFOSAA	100	0.50	---	---	1	10	0.00500
d5-EtFOSAA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	100	0.50	---	---	1	10	0.00500
13C2-PFOA	100	0.50	---	---	1	10	0.00500
13C3-PFBA	100	0.50	---	---	1	10	0.00500
13C4-PFOS	100	0.48	---	---	1	10	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	100	0.47	---	---	1	10	0.00469
13C2-6:2FTS	100	0.48	---	---	1	10	0.00476
13C2-8:2FTS	100	0.48	---	---	1	10	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ89

Description: PFAS DoD ICAL L8

13C4-PFBA	100	0.50	---	---	1	10	0.00500
13C5-PFPeA	100	0.50	---	---	1	10	0.00500
13C8-FOSA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ79

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	500	0.50	---	---	1	10	0.02500
1H,1H,2H,2H-Perfluorodecane sulfonate	500	0.51	---	---	1	10	0.02525
1H,1H,2H,2H-perfluorododecane sulfonate	500	0.48	---	---	1	10	0.02415
1H,1H,2H,2H-Perfluorohexane sulfonate	500	0.50	---	---	1	10	0.02500
1H,1H,2H,2H-Perfluorooctane sulfonate	500	0.50	---	---	1	10	0.02500
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	500	0.50	---	---	1	10	0.02500
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	500	0.50	---	---	1	10	0.02500
3-Perfluoroheptyl propanoic acid	500	0.50	---	---	1	10	0.02500
3-Perfluoropentyl propanoic acid	500	0.50	---	---	1	10	0.02500
3-perfluoropropyl propanoic Acid	500	0.50	---	---	1	10	0.02500
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	500	0.50	---	---	1	10	0.02500
Adona	500	0.50	---	---	1	10	0.02500
Hexafluoropropylene oxide dimer acid	500	0.50	---	---	1	10	0.02500
N-ethylperfluoro-1-octanesulfonamide	500	0.50	---	---	1	10	0.02500
N-ethylperfluoro-octanesulfonamidoacetic acid	500	0.50	---	---	1	10	0.02500
N-methylperfluoro-1-octanesulfonamide	500	0.50	---	---	1	10	0.02500
N-methylperfluoro-1-octanesulfonamidoacetic acid	500	0.50	---	---	1	10	0.02500
nonafluoro-3,6-dioxaheptanoic acid	500	0.50	---	---	1	10	0.02500
Perfluoro (2-ethoxyethane) sulfonic acid	500	0.45	---	---	1	10	0.02230
Perfluoro-1-butanesulfonate	500	0.50	---	---	1	10	0.02500
Perfluoro-1-decanesulfonate	500	0.51	---	---	1	10	0.02525
Perfluoro-1-dodecanesulfonate	500	0.49	---	---	1	10	0.02425
Perfluoro-1-heptanesulfonate	500	0.50	---	---	1	10	0.02500
Perfluoro-1-hexanesulfonate	500	0.50	---	---	1	10	0.02500
Perfluoro-1-nonanesulfonate	500	0.51	---	---	1	10	0.02525
Perfluoro-1-octanesulfonamide	500	0.50	---	---	1	10	0.02500
Perfluoro-1-octanesulfonate	500	0.50	---	---	1	10	0.02500
perfluoro-1-pentanesulfonate	500	0.50	---	---	1	10	0.02500
Perfluoro-3-methoxypropanoic acid	500	0.50	---	---	1	10	0.02500
Perfluoro-4-methoxybutanoic acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-butanoic Acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-decanoic Acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-dodecanoic acid	500	0.50	---	---	1	10	0.02500

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ89

Description: PFAS DoD ICAL L8

Perfluoro-n-heptanoic Acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-hexadecanoic acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-hexanoic acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-octadecanoic acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-octanoic Acid	500	0.50	---	---	1	10	0.02500
Perfluorononanoic Acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-pentanoic acid	500	0.51	---	---	1	10	0.02525
Perfluoro-n-tetradecanoic acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-tridecanoic acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-undecanoic acid	500	0.50	---	---	1	10	0.02500

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.02500
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.02525
1H,1H,2H,2H-perfluorododecane sulfonate	.02415

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ89

Description: PFAS DoD ICAL L8

1H,1H,2H,2H-Perfluorohexane sulfonate	.02500
1H,1H,2H,2H-Perfluorooctane sulfonate	.02500
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.02500
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.02500
3-Perfluoroheptyl propanoic acid	.02500
3-Perfluoropentyl propanoic acid	.02500
3-perfluoropropyl propanoic Acid	.02500
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.02500
Adona	.02500
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.02500
N-ethylperfluoro-1-octanesulfonamide	.02500
N-ethylperfluoro-octanesulfonamidoacetic acid	.02500
N-methylperfluoro-1-octanesulfonamide	.02500
N-methylperfluoro-1-octanesulfonamidoacetic acid	.02500
nonafluoro-3,6-dioxaheptanoic acid	.02500
Perfluoro (2-ethoxyethane) sulfonic acid	.02230
Perfluoro-1-butanesulfonate	.02500
Perfluoro-1-decanesulfonate	.02525
Perfluoro-1-dodecanesulfonate	.02425
Perfluoro-1-heptanesulfonate	.02500
Perfluoro-1-hexanesulfonate	.02500
Perfluoro-1-nonanesulfonate	.02525
Perfluoro-1-octanesulfonamide	.02500
Perfluoro-1-octanesulfonate	.02500
perfluoro-1-pentanesulfonate	.02500
Perfluoro-3-methoxypropanoic acid	.02500
Perfluoro-4-methoxybutanoic acid	.02500
Perfluoro-n-butanoic Acid	.02500
Perfluoro-n-decanoic Acid	.02500
Perfluoro-n-dodecanoic acid	.02500
Perfluoro-n-heptanoic Acid	.02500
Perfluoro-n-hexadecanoic acid	.02500
Perfluoro-n-hexanoic acid	.02500

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ89

Description: PFAS DoD ICAL L8

Perfluoro-n-octadecanoic acid	.02500
Perfluoro-n-octanoic Acid	.02500
Perfluorononanoic Acid	.02500
Perfluoro-n-pentanoic acid	.02525
Perfluoro-n-tetradecanoic acid	.02500
Perfluoro-n-tridecanoic acid	.02500
Perfluoro-n-undecanoic acid	.02500

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	C202360925
LX92	Pipette	C202360925
LZ07	Pipette	C202360925
LZ39	Pipette	C202360925
LZ79	Pipette	B820865811

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ90

Description: PFAS DoD ICAL L9

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	100	0.50	---	---	1	10	0.00500
d3-MeFOSA	100	0.50	---	---	1	10	0.00500
d5-EtFOSA	100	0.50	---	---	1	10	0.00500
d7-MeFOSE	100	0.50	---	---	1	10	0.00500
d9-EtFOSE	100	0.50	---	---	1	10	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	100	0.50	---	---	1	10	0.00500
13C2-PFTeDA	100	0.50	---	---	1	10	0.00500
13C3-HFPO-DA	100	0.50	---	---	1	10	0.00500
13C3-PFBS	100	0.47	---	---	1	10	0.00466
13C3-PFHxS	100	0.47	---	---	1	10	0.00474
13C4-PFHpA	100	0.50	---	---	1	10	0.00500
13C5-PFHxA	100	0.50	---	---	1	10	0.00500
13C6-PFDA	100	0.50	---	---	1	10	0.00500
13C7-PFUnA	100	0.50	---	---	1	10	0.00500
13C8-PFOA	100	0.50	---	---	1	10	0.00500
13C8-PFOS	100	0.48	---	---	1	10	0.00479
13C9-PFNA	100	0.50	---	---	1	10	0.00500
d3-MeFOSAA	100	0.50	---	---	1	10	0.00500
d5-EtFOSAA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	100	0.50	---	---	1	10	0.00500
13C2-PFOA	100	0.50	---	---	1	10	0.00500
13C3-PFBA	100	0.50	---	---	1	10	0.00500
13C4-PFOS	100	0.48	---	---	1	10	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	100	0.47	---	---	1	10	0.00469
13C2-6:2FTS	100	0.48	---	---	1	10	0.00476
13C2-8:2FTS	100	0.48	---	---	1	10	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ90

Description: PFAS DoD ICAL L9

13C4-PFBA	100	0.50	---	---	1	10	0.00500
13C5-PFPeA	100	0.50	---	---	1	10	0.00500
13C8-FOSA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ79

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	1000	0.50	---	---	1	10	0.05000
1H,1H,2H,2H-Perfluorodecane sulfonate	1000	0.51	---	---	1	10	0.05050
1H,1H,2H,2H-perfluorododecane sulfonate	1000	0.48	---	---	1	10	0.04830
1H,1H,2H,2H-Perfluorohexane sulfonate	1000	0.50	---	---	1	10	0.05000
1H,1H,2H,2H-Perfluorooctane sulfonate	1000	0.50	---	---	1	10	0.05000
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	1000	0.50	---	---	1	10	0.05000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	1000	0.50	---	---	1	10	0.05000
3-Perfluoroheptyl propanoic acid	1000	0.50	---	---	1	10	0.05000
3-Perfluoropentyl propanoic acid	1000	0.50	---	---	1	10	0.05000
3-perfluoropropyl propanoic Acid	1000	0.50	---	---	1	10	0.05000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	1000	0.50	---	---	1	10	0.05000
Adona	1000	0.50	---	---	1	10	0.05000
Hexafluoropropylene oxide dimer acid	1000	0.50	---	---	1	10	0.05000
N-ethylperfluoro-1-octanesulfonamide	1000	0.50	---	---	1	10	0.05000
N-ethylperfluoro-octanesulfonamidoacetic acid	1000	0.50	---	---	1	10	0.05000
N-methylperfluoro-1-octanesulfonamide	1000	0.50	---	---	1	10	0.05000
N-methylperfluoro-1-octanesulfonamidoacetic acid	1000	0.50	---	---	1	10	0.05000
nonafluoro-3,6-dioxaheptanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro (2-ethoxyethane) sulfonic acid	1000	0.45	---	---	1	10	0.04460
Perfluoro-1-butanesulfonate	1000	0.50	---	---	1	10	0.05000
Perfluoro-1-decanesulfonate	1000	0.51	---	---	1	10	0.05050
Perfluoro-1-dodecanesulfonate	1000	0.49	---	---	1	10	0.04850
Perfluoro-1-heptanesulfonate	1000	0.50	---	---	1	10	0.05000
Perfluoro-1-hexanesulfonate	1000	0.50	---	---	1	10	0.05000
Perfluoro-1-nonanesulfonate	1000	0.51	---	---	1	10	0.05050
Perfluoro-1-octanesulfonamide	1000	0.50	---	---	1	10	0.05000
Perfluoro-1-octanesulfonate	1000	0.50	---	---	1	10	0.05000
perfluoro-1-pentanesulfonate	1000	0.50	---	---	1	10	0.05000
Perfluoro-3-methoxypropanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-4-methoxybutanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-butanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-decanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-dodecanoic acid	1000	0.50	---	---	1	10	0.05000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ90

Description: PFAS DoD ICAL L9

Perfluoro-n-heptanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-hexadecanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-hexanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-octadecanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-octanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluorononanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-pentanoic acid	1000	0.51	---	---	1	10	0.05050
Perfluoro-n-tetradecanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-tridecanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-undecanoic acid	1000	0.50	---	---	1	10	0.05000

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.05000
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.05050
1H,1H,2H,2H-perfluorododecane sulfonate	.04830

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ90

Description: PFAS DoD ICAL L9

1H,1H,2H,2H-Perfluorohexane sulfonate	.05000
1H,1H,2H,2H-Perfluorooctane sulfonate	.05000
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.05000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.05000
3-Perfluoroheptyl propanoic acid	.05000
3-Perfluoropentyl propanoic acid	.05000
3-perfluoropropyl propanoic Acid	.05000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.05000
Adona	.05000
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.05000
N-ethylperfluoro-1-octanesulfonamide	.05000
N-ethylperfluoro-octanesulfonamidoacetic acid	.05000
N-methylperfluoro-1-octanesulfonamide	.05000
N-methylperfluoro-1-octanesulfonamidoacetic acid	.05000
nonafluoro-3,6-dioxaheptanoic acid	.05000
Perfluoro (2-ethoxyethane) sulfonic acid	.04460
Perfluoro-1-butanesulfonate	.05000
Perfluoro-1-decanesulfonate	.05050
Perfluoro-1-dodecanesulfonate	.04850
Perfluoro-1-heptanesulfonate	.05000
Perfluoro-1-hexanesulfonate	.05000
Perfluoro-1-nonanesulfonate	.05050
Perfluoro-1-octanesulfonamide	.05000
Perfluoro-1-octanesulfonate	.05000
perfluoro-1-pentanesulfonate	.05000
Perfluoro-3-methoxypropanoic acid	.05000
Perfluoro-4-methoxybutanoic acid	.05000
Perfluoro-n-butanoic Acid	.05000
Perfluoro-n-decanoic Acid	.05000
Perfluoro-n-dodecanoic acid	.05000
Perfluoro-n-heptanoic Acid	.05000
Perfluoro-n-hexadecanoic acid	.05000
Perfluoro-n-hexanoic acid	.05000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ90**

Description: PFAS DoD ICAL L9

Perfluoro-n-octadecanoic acid	.05000
Perfluoro-n-octanoic Acid	.05000
Perfluorononanoic Acid	.05000
Perfluoro-n-pentanoic acid	.05050
Perfluoro-n-tetradecanoic acid	.05000
Perfluoro-n-tridecanoic acid	.05000
Perfluoro-n-undecanoic acid	.05000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	C202360925
LX92	Pipette	C202360925
LZ07	Pipette	C202360925
LZ39	Pipette	C202360925
LZ79	Pipette	B820865811

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ91

Description: PFAS DoD Instrument Blank

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	100	0.50	---	---	1	10	0.00500
d3-MeFOSA	100	0.50	---	---	1	10	0.00500
d5-EtFOSA	100	0.50	---	---	1	10	0.00500
d7-MeFOSE	100	0.50	---	---	1	10	0.00500
d9-EtFOSE	100	0.50	---	---	1	10	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	100	0.50	---	---	1	10	0.00500
13C2-PFTeDA	100	0.50	---	---	1	10	0.00500
13C3-HFPO-DA	100	0.50	---	---	1	10	0.00500
13C3-PFBS	100	0.47	---	---	1	10	0.00466
13C3-PFHxS	100	0.47	---	---	1	10	0.00474
13C4-PFHpA	100	0.50	---	---	1	10	0.00500
13C5-PFHxA	100	0.50	---	---	1	10	0.00500
13C6-PFDA	100	0.50	---	---	1	10	0.00500
13C7-PFUnA	100	0.50	---	---	1	10	0.00500
13C8-PFOA	100	0.50	---	---	1	10	0.00500
13C8-PFOS	100	0.48	---	---	1	10	0.00479
13C9-PFNA	100	0.50	---	---	1	10	0.00500
d3-MeFOSAA	100	0.50	---	---	1	10	0.00500
d5-EtFOSAA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	100	0.50	---	---	1	10	0.00500
13C2-PFOA	100	0.50	---	---	1	10	0.00500
13C3-PFBA	100	0.50	---	---	1	10	0.00500
13C4-PFOS	100	0.48	---	---	1	10	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	100	0.47	---	---	1	10	0.00469
13C2-6:2FTS	100	0.48	---	---	1	10	0.00476
13C2-8:2FTS	100	0.48	---	---	1	10	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ91

Description: PFAS DoD Instrument Blank

13C4-PFBA	100	0.50	---	---	1	10	0.00500
13C5-PFPeA	100	0.50	---	---	1	10	0.00500
13C8-FOSA	100	0.50	---	---	1	10	0.00500

Final Concentrations:

Analyte:	Conc (ug/mL):
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	C202360925

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ91**

Description: PFAS DoD Instrument Blank

LX92	Pipette	C202360925
LZ07	Pipette	C202360925
LZ39	Pipette	C202360925

Solution Prepared By:	Harnden, Kelsey	**Date Prepared:**	8/9/2023	**Expiration Date:**	3/14/2024
Solution Volume :	15 **mL X** 1 **Vials**	**Refrigerator/Freezer No:**	LC Laboratory #2: Refrigerator - R0121		

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ92

Description: PFAS DoD ICC

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	100	0.50	---	---	1	10	0.00500
d3-MeFOSA	100	0.50	---	---	1	10	0.00500
d5-EtFOSA	100	0.50	---	---	1	10	0.00500
d7-MeFOSE	100	0.50	---	---	1	10	0.00500
d9-EtFOSE	100	0.50	---	---	1	10	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	100	0.50	---	---	1	10	0.00500
13C2-PFTeDA	100	0.50	---	---	1	10	0.00500
13C3-HFPO-DA	100	0.50	---	---	1	10	0.00500
13C3-PFBS	100	0.47	---	---	1	10	0.00466
13C3-PFHxS	100	0.47	---	---	1	10	0.00474
13C4-PFHpA	100	0.50	---	---	1	10	0.00500
13C5-PFHxA	100	0.50	---	---	1	10	0.00500
13C6-PFDA	100	0.50	---	---	1	10	0.00500
13C7-PFUnA	100	0.50	---	---	1	10	0.00500
13C8-PFOA	100	0.50	---	---	1	10	0.00500
13C8-PFOS	100	0.48	---	---	1	10	0.00479
13C9-PFNA	100	0.50	---	---	1	10	0.00500
d3-MeFOSAA	100	0.50	---	---	1	10	0.00500
d5-EtFOSAA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	100	0.50	---	---	1	10	0.00500
13C2-PFOA	100	0.50	---	---	1	10	0.00500
13C3-PFBA	100	0.50	---	---	1	10	0.00500
13C4-PFOS	100	0.48	---	---	1	10	0.00479

Stock Id: LZ32

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	125	0.20	---	---	1	10	0.00250
1H,1H,2H,2H-Perfluorodecane sulfonate	125	0.20	---	---	1	10	0.00253
1H,1H,2H,2H-perfluorododecane sulfonate	125	0.19	---	---	1	10	0.00242

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ92

Description: PFAS DoD ICC

1H,1H,2H,2H-Perfluorohexane sulfonate	125	0.20	---	---	1	10	0.00250
1H,1H,2H,2H-Perfluorooctane sulfonate	125	0.20	---	---	1	10	0.00250
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	125	0.20	---	---	1	10	0.00250
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	125	0.20	---	---	1	10	0.00250
3-Perfluoroheptyl propanoic acid	125	0.20	---	---	1	10	0.00250
3-Perfluoropentyl propanoic acid	125	0.20	---	---	1	10	0.00250
3-perfluoropropyl propanoic Acid	125	0.20	---	---	1	10	0.00250
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	125	0.20	---	---	1	10	0.00250
Adona	125	0.20	---	---	1	10	0.00250
Hexafluoropropylene oxide dimer acid	125	0.20	---	---	1	10	0.00250
N-ethylperfluoro-1-octanesulfonamide	125	0.20	---	---	1	10	0.00250
N-ethylperfluoro-octanesulfonamidoacetic acid	125	0.20	---	---	1	10	0.00250
N-methylperfluoro-1-octanesulfonamide	125	0.20	---	---	1	10	0.00250
N-methylperfluoro-1-octanesulfonamidoacetic acid	125	0.20	---	---	1	10	0.00250
nonafluoro-3,6-dioxaheptanoic acid	125	0.20	---	---	1	10	0.00250
Perfluoro (2-ethoxyethane) sulfonic acid	125	0.18	---	---	1	10	0.00223
Perfluoro-1-butanesulfonate	125	0.20	---	---	1	10	0.00250
Perfluoro-1-decanesulfonate	125	0.20	---	---	1	10	0.00253
Perfluoro-1-dodecanesulfonate	125	0.19	---	---	1	10	0.00243
Perfluoro-1-heptanesulfonate	125	0.20	---	---	1	10	0.00250
Perfluoro-1-hexanesulfonate	125	0.20	---	---	1	10	0.00250
Perfluoro-1-nonanesulfonate	125	0.20	---	---	1	10	0.00253
Perfluoro-1-octanesulfonamide	125	0.20	---	---	1	10	0.00250
Perfluoro-1-octanesulfonate	125	0.20	---	---	1	10	0.00250
perfluoro-1-pentanesulfonate	125	0.20	---	---	1	10	0.00250
Perfluoro-3-methoxypropanoic acid	125	0.20	---	---	1	10	0.00250
Perfluoro-4-methoxybutanoic acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-butanoic Acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-decanoic Acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-dodecanoic acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-heptanoic Acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-hexadecanoic acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-hexanoic acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-octadecanoic acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-octanoic Acid	125	0.20	---	---	1	10	0.00250
Perfluorononanoic Acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-pentanoic acid	125	0.20	---	---	1	10	0.00253
Perfluoro-n-tetradecanoic acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-tridecanoic acid	125	0.20	---	---	1	10	0.00250

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ92

Description: PFAS DoD ICC

Perfluoro-n-undecanoic acid	125	0.20	---	---	1	10	0.00250

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	100	0.47	---	---	1	10	0.00469
13C2-6:2FTS	100	0.48	---	---	1	10	0.00476
13C2-8:2FTS	100	0.48	---	---	1	10	0.00480
13C4-PFBA	100	0.50	---	---	1	10	0.00500
13C5-PFPeA	100	0.50	---	---	1	10	0.00500
13C8-FOSA	100	0.50	---	---	1	10	0.00500

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.00250
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.00253
1H,1H,2H,2H-perfluorododecane sulfonate	.00242

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ92

Description: PFAS DoD ICC

1H,1H,2H,2H-Perfluorohexane sulfonate	.00250
1H,1H,2H,2H-Perfluorooctane sulfonate	.00250
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.00250
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.00250
3-Perfluoroheptyl propanoic acid	.00250
3-Perfluoropentyl propanoic acid	.00250
3-perfluoropropyl propanoic Acid	.00250
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.00250
Adona	.00250
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.00250
N-ethylperfluoro-1-octanesulfonamide	.00250
N-ethylperfluoro-octanesulfonamidoacetic acid	.00250
N-methylperfluoro-1-octanesulfonamide	.00250
N-methylperfluoro-1-octanesulfonamidoacetic acid	.00250
nonafluoro-3,6-dioxaheptanoic acid	.00250
Perfluoro (2-ethoxyethane) sulfonic acid	.00223
Perfluoro-1-butanesulfonate	.00250
Perfluoro-1-decanesulfonate	.00253
Perfluoro-1-dodecanesulfonate	.00243
Perfluoro-1-heptanesulfonate	.00250
Perfluoro-1-hexanesulfonate	.00250
Perfluoro-1-nonanesulfonate	.00253
Perfluoro-1-octanesulfonamide	.00250
Perfluoro-1-octanesulfonate	.00250
perfluoro-1-pentanesulfonate	.00250
Perfluoro-3-methoxypropanoic acid	.00250
Perfluoro-4-methoxybutanoic acid	.00250
Perfluoro-n-butanoic Acid	.00250
Perfluoro-n-decanoic Acid	.00250
Perfluoro-n-dodecanoic acid	.00250
Perfluoro-n-heptanoic Acid	.00250
Perfluoro-n-hexadecanoic acid	.00250
Perfluoro-n-hexanoic acid	.00250

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ92**

Description: PFAS DoD ICC

Perfluoro-n-octadecanoic acid	.00250
Perfluoro-n-octanoic Acid	.00250
Perfluorononanoic Acid	.00250
Perfluoro-n-pentanoic acid	.00253
Perfluoro-n-tetradecanoic acid	.00250
Perfluoro-n-tridecanoic acid	.00250
Perfluoro-n-undecanoic acid	.00250

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	C202360925
LX92	Pipette	C202360925
LZ07	Pipette	C202360925
LZ32	Pipette	B814657482
LZ39	Pipette	C202360925

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

BDO Id: 220124-04

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	M2PFHxA	**Received:**	1/24/2022
Vendor:	Wellington Laboratories	**Custodian:**	Thorn, Jonathan
Catalogue No:	M2PFHxA	**Expires:**	11/23/2026
Type:	Solution	**Consumed:**	
Lot No:	M2PFHxA1121	**Stored In:**	VOC Laboratory - R0123
Quantity:	1 ea Unit	**% Moisture:**	0
Description:	M2PFHxA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C2-PFHxDA	BDO-2430	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFHxDA	**LOT NUMBER:**	M2PFHxDA1121
COMPOUND:	Perfluoro-n-(1,2-$^{13}C_2$)hexadecanoic acid		
STRUCTURE:		**CAS #:**	Not available

MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{14}HF_{31}O_2$	**MOLECULAR WEIGHT:**	816.11
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/23/2021		
EXPIRY DATE: (mm/dd/yyyy)	11/23/2026		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~0.5% of native perfluoro-n-hexadecanoic acid (PFHxDA) and ~0.4% of perfluoro-n-($^{13}C_1$)pentadecanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/10/2021 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 220728-19

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C2-PFDA	**Received:**	7/28/2022
Vendor:	Wellington Laboratories	**Custodian:**	Harnden, Kelsey
Catalogue No:	MPFDA	**Expires:**	12/8/2026
Type:	Solution	**Consumed:**	
Lot No:	MPFDA1221	**Stored In:**	VOC Laboratory - R0121
Quantity:	1 ea Ampoule	**% Moisture:**	
Description:	MPFDA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C2-PFDA	BDO-2110	50.0000	98.00	--	--	☐			
13C6-PFDA	BDO-2222	--		--	--	☐			

Total Analytes: 2

Notes:

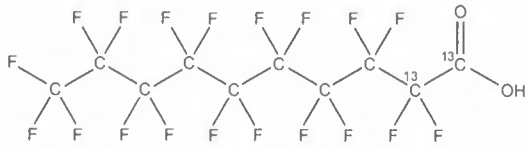
Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA1221
COMPOUND:	Perfluoro-n-(1,2-$^{13}C_2$)decanoic acid		
STRUCTURE:		**CAS #:**	960315-50-8



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	12/08/2021		
EXPIRY DATE: (mm/dd/yyyy)	12/08/2026		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/13/2021 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 221103-02

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name: Method 537.1 Analyte Primary Dultio
Vendor: Cambridge Isotope Laborat
Catalogue No: ES-5631
Type: Solution
Lot No: PR-32174
Quantity: 16 ea ampoules **% Moisture:**
Description: Method 537.1 Analyte Primary Dultion STD

Received: 11/3/2022
Custodian: Beal, Hayley
Expires: 12/7/2026
Consumed:
Stored In: Sample Preparation - C0103

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
11-chloroeicosafluoro-3-oxaundecan	763051-92-9	2.0000	100.00	--	--	☐			
9-chlorohexadecafluoro-3-oxanonane	756426-58-1	2.0000	100.00	--	--	☐			
Adona	919005-14-4	2.0000	100.00	--	--	☐			
Hexafluoropropylene oxide dimer aci	13252-13-6	2.0000	100.00	--	--	☐			
N-ethylperfluoro-octanesulfonamidoa	2991-50-6	2.0000	100.00	--	--	☐			
N-methylperfluoro-1-octanesulfonami	2355-31-9	2.0000	100.00	--	--	☐			
Perfluoro-1-butanesulfonate	375-73-5	2.0000	100.00	--	--	☐			
Perfluoro-1-hexanesulfonate	355-46-4	2.0000	100.00	--	--	☐			
Perfluoro-1-octanesulfonate	1763-23-1	2.0000	100.00	--	--	☐			
Perfluoro-n-decanoic Acid	335-76-2	2.0000	100.00	--	--	☐			
Perfluoro-n-dodecanoic acid	307-55-1	2.0000	100.00	--	--	☐			
Perfluoro-n-heptanoic Acid	375-85-9	2.0000	100.00	--	--	☐			
Perfluoro-n-hexanoic acid	307-24-4	2.0000	100.00	--	--	☐			
Perfluoro-n-octanoic Acid	335-67-1	2.0000	100.00	--	--	☐			
Perfluorononanoic Acid	375-95-1	2.0000	100.00	--	--	☐			
Perfluoro-n-tetradecanoic acid	376-06-7	2.0000	100.00	--	--	☐			
Perfluoro-n-tridecanoic acid	72629-94-8	2.0000	100.00	--	--	☐			
Perfluoro-n-undecanoic acid	2058-94-8	2.0000	100.00	--	--	☐			

Total Analytes: 18

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

221163-02

Product Description: Method 537.1 Analyte Primary Dilution STD (PDS)
Catalog Number: ES-5631
Lot Number: PR-32714
Solvent: Methanol (w/ 4Molar Equivalents NaOH)
Volume per Ampoule: 1.2 mL
Storage Conditions: Store at room temperature away from light and moisture.
Intended Use: For Research Use Only. Not for use in diagnostic procedures.
QC Release Date: December 7, 2021
Expiration Date: December 7, 2026

Component	Acronym	Target Concentration (ng/mL)	Gravimetric Concentration of Salt ± Uncertainty, (k=2) (ng/mL)	Gravimetric Concentration of Free Acid ± Uncertainty (k=2) (ng/mL)
Perfluorohexanoic acid, sodium salt	PFHxA	2,000	2,140 ± 2	2,000 ± 2
Perfluoroheptanoic acid	PFHpA	2,000	-	2,000 ± 20
Perfluorooctanoic acid	PFOA	2,000	-	2,000 ± 21
Perfluorononanoic acid	PFNA	2,000	-	2,000 ± 20
Perfluorodecanoic acid, sodium salt	PFDA	2,000	2,086 ± 21	2,000 ± 21
Perfluoroundecanoic acid, sodium salt	PFUdA	2,000	2,078 ± 22	2,000 ± 22
Perfluorododecanoic acid, sodium salt	PFDoA	2,000	2,072 ± 34	2,000 ± 34
Perfluorotridecanoic acid	PFTrDA	2,000	-	2,000 ± 32
Perfluorotetradecanoic acid	PFTeDA	2,000	-	2,000 ± 21
Perfluorobutanesulfonate, potassium salt	PFBS	2,000	2,254 ± 23	2,000 ± 23
Potassium perfluorohexanesulfonate (mixed isomers)	PFHxS	2,000	2,190 ± 23	2,000 ± 23
Perfluorooctanesulfonate (mixed isomers)	PFOS	2,000	-	2,000 ± 20
N-Ethylperfluorooctanesulfonamidoacetic acid (mixed isomers)	N-EtFOSAA	2,000	-	2,000 ± 100
N-Methylperfluorooctanesulfonamidoacetic acid (mixed isomers)	N-MeFOSAA	2,000	-	2,000 ± 100
Tetrafluoro-2-(heptafluoropropoxy)propanoic acid "GENX"	HFPO-DA	2,000	-	2,000 ± 20
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid, potassium salt	11CL-PF3OUDS	2,000	2,120 ± 21	2,000 ± 21
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid, potassium salt	9CL-PF3ONS	2,000	2,143 ± 26	2,000 ± 26
Dodecafluoro-3H-4,8-dioxanonanoic acid, sodium salt	NaDONA	2,000	2,116 ± 106	2,000 ± 106

Notes:

- Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

BATTELLE
It can be done

BDO Id: 230113-01

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name: PFOA-DoD
Vendor: ABSOLUTE STANDARDS
Catalogue No: 64029
Type: Solution
Lot No: 110922
Quantity: 10 ea ampoules **% Moisture:**
Description: PFOA-DoD

Received: 1/13/2023
Custodian: Beal, Hayley
Expires: 11/9/2027
Consumed:
Stored In: LC Laboratory - F0111

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
11-chloroeicosafluoro-3-oxaundecan	763051-92-9	1.0000	100.00	--	--	☐			
1H,1H,2H,2H-Perfluorodecane sulfo	39108-34-4	1.0100	100.00	--	--	☐			
1H,1H,2H,2H-Perfluorohexane sulfon	757124-72-4	1.0000	100.00	--	--	☐			
1H,1H,2H,2H-Perfluorooctane sulfon	27619-97-2	1.0000	100.00	--	--	☐			
9-chlorohexadecafluoro-3-oxanonane	756426-58-1	1.0000	100.00	--	--	☐			
Adona	919005-14-4	1.0000	100.00	--	--	☐			
Hexafluoropropylene oxide dimer aci	13252-13-6	1.0000	100.00	--	--	☐			
N-ethylperfluoro-octanesulfonamidoa	2991-50-6	1.0000	100.00	--	--	☐			
N-methylperfluoro-1-octanesulfonami	2355-31-9	1.0000	100.00	--	--	☐			
Perfluoro-1-butanesulfonate	375-73-5	1.0000	100.00	--	--	☐			
Perfluoro-1-decanesulfonate	335-77-3	1.0100	100.00	--	--	☐			
Perfluoro-1-heptanesulfonate	375-92-8	1.0000	100.00	--	--	☐			
Perfluoro-1-hexanesulfonate	355-46-4	1.0000	100.00	--	--	☐			
Perfluoro-1-nonanesulfonate	68259-12-1	1.0100	100.00	--	--	☐			
Perfluoro-1-octanesulfonamide	754-91-6	1.0000	100.00	--	--	☐			
Perfluoro-1-octanesulfonate	1763-23-1	1.0000	100.00	--	--	☐			
perfluoro-1-pentanesulfonate	2706-91-4	1.0000	100.00	--	--	☐			
Perfluoro-n-butanoic Acid	375-22-4	1.0000	100.00	--	--	☐			
Perfluoro-n-decanoic Acid	335-76-2	1.0000	100.00	--	--	☐			
Perfluoro-n-dodecanoic acid	307-55-1	1.0000	100.00	--	--	☐			
Perfluoro-n-heptanoic Acid	375-85-9	1.0000	100.00	--	--	☐			
Perfluoro-n-hexanoic acid	307-24-4	1.0000	100.00	--	--	☐			
Perfluoro-n-octanoic Acid	335-67-1	1.0000	100.00	--	--	☐			
Perfluorononanoic Acid	375-95-1	1.0000	100.00	--	--	☐			
Perfluoro-n-pentanoic acid	2706-90-3	1.0100	100.00	--	--	☐			
Perfluoro-n-tetradecanoic acid	376-06-7	1.0000	100.00	--	--	☐			
Perfluoro-n-tridecanoic acid	72629-94-8	1.0000	100.00	--	--	☐			
Perfluoro-n-undecanoic acid	2058-94-8	1.0000	100.00	--	--	☐			

Total Analytes: 28

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230113-01

CERTIFIED WEIGHT REPORT

Part Number:	64029			
Lot Number:	110922	**Solvent(s):**	**Lot#**	
Description:	PFOA - DOD	Methanol (1 mM KOH)	102722	(98%)
	28 components	2-Propanol	32500	(2%)
Expiration Date:	110927			
Recommended Storage:	Freezer (0 °C)			
Nominal Concentration (µg/mL):	1.0			
NIST Test ID#:	6UTB	5E-05	Balance Uncertainty	
Volume(s) shown below were combined and diluted to (mL):		100.0	0.012	Flask Uncertainty

Formulated By:	Prashant Chauhan	110922 DATE
Reviewed By:	Pedro L. Rentas	110922 DATE

Note: All assigned values are anion concentrations.

	Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Initial Conc.(µg/mL)	Final Conc.(µg/mL)	Expanded Uncertainty (+/-) µg/mL	SDS Information (Solvent Safety Info. On Attached pg.) Free Acid CAS#	OSHA PEL (TWA)	LD50
1.	Perfluoro-n-butanoic acid (PFBA)	99542	110922	0.02	2.00	0.017	50.1	1.00	0.02	375-22-4	N/A	N/A
2.	Perfluoro-n-pentanoic acid (PFPeA)	99543	050222	0.02	2.00	0.017	50.3	1.01	0.02	2706-90-3	N/A	N/A
3.	Perfluorohexanoic acid (PFHxA)	99199	071122	0.02	2.00	0.017	50.2	1.00	0.02	307-24-4	N/A	N/A
4.	Perfluoroheptanoic acid (PFHpA)	99197	110922	0.02	2.00	0.017	50.1	1.00	0.02	375-85-9	N/A	N/A
5.	Perfluorooctanoic acid (br-PFOA)*	99202	080522	0.02	2.00	0.017	50.2	1.00	0.02	335-67-1 (L)	N/A	ipr-rat 189mg/kg
6.	Perfluorononanoic acid (PFNA)	99200	110922	0.02	2.00	0.017	50.1	1.00	0.02	375-95-1	N/A	N/A
7.	Perfluorodecanoic acid (PFDA)	99195	110922	0.02	2.00	0.017	50.0	1.00	0.02	335-76-2	N/A	orl-rat 57mg/kg
8.	Perfluoroundecanoic acid (PFUnA)	99205	071522	0.02	2.00	0.017	50.2	1.00	0.02	2058-94-8	N/A	N/A
9.	Perfluorododecanoic acid (PFDoA)	99196	071522	0.02	2.00	0.017	50.1	1.00	0.02	307-55-1	N/A	N/A
10.	Perfluorotridecanoic acid (PFTrDA)	99204	110922	0.02	2.00	0.017	50.1	1.00	0.02	72629-94-8	N/A	N/A
11.	Perfluorotetradecanoic acid (PFTeDA)	99203	033022	0.02	2.00	0.017	50.1	1.00	0.02	376-06-7	N/A	N/A
12.	Perfluoro-1-octanesulfonamide (FOSA)	3677	FOSA0322I	0.02	2.00	0.017	50.0	1.00	0.05	754-91-6	N/A	N/A
13.	N-Methylperfluorooctanesulfonamidoacetic acid (br-NMeFOSAA)*	4162	brNMeFOSAA0422	0.02	2.00	0.017	50.0	1.00	0.05	2355-31-9 (L)	N/A	N/A
14.	N-Ethylperfluorooctanesulfonamidoacetic acid (br-NEtFOSAA)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	50.0	1.00	0.05	2991-50-6 (L)	N/A	N/A
15.	Perfluorobutanesulfonic acid (PFBS)	99194	080522	0.02	2.00	0.017	50.2	1.00	0.02	375-73-5	N/A	N/A
16.	Perfluoro-1-pentanesulfonic acid (PFPeS)	99544	032422	0.02	2.00	0.017	50.1	1.00	0.02	2706-91-4	N/A	N/A
17.	Perfluorohexanesulfonic acid (br-PFHxS)*	99198	071522	0.02	2.00	0.017	50.2	1.00	0.02	355-46-4 (L)	N/A	N/A
18.	Perfluoro-1-heptanesulfonic acid (PFHpS)	3672	LPFHpS0822	0.021	2.10	0.017	47.6	1.00	0.05	375-92-6	N/A	N/A
19.	Heptadecafluorooctanesulfonic acid (br-PFOS)*	99201	033022	0.02	2.00	0.017	50.1	1.00	0.02	1763-23-1 (L)	N/A	N/A
20.	Perfluoro-1-nonanesulfonic acid (PFNS)	3957	LPFNS1021	0.021	2.10	0.017	48.0	1.01	0.05	68259-12-1	N/A	N/A
21.	Perfluoro-1-decanesulfonic acid (PFDS)	3871	LPFDS0222	0.021	2.10	0.017	48.2	1.01	0.05	335-77-3	N/A	N/A
22.	1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	65271	080522	0.02	2.00	0.017	50.2	1.00	0.05	757124-72-4	N/A	N/A
23.	1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	65272	071522	0.02	2.00	0.017	50.2	1.00	0.05	27619-97-2	N/A	N/A
24.	1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	3662	62FTS0822	0.021	2.10	0.017	47.9	1.01	0.05	39108-34-4	N/A	N/A
25.	2-(Heptafluoropropoxy)-2,3,3,3-tetrafluoropropionic acid (HFPO-DA)	99666	080522	0.02	2.00	0.017	50.1	1.00	0.02	13252-13-6	N/A	N/A
26.	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	4165	11ClPF3OUdS0522	0.021	2.12	0.017	47.1	1.00	0.05	763051-92-9	N/A	N/A
27.	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	4164	9ClPF3ONS0522	0.021	2.14	0.017	46.6	1.00	0.05	756426-58-1	N/A	N/A
28.	Dodecafluoro-3H-4,8-dioxanonanoic acid (ADONA)	4103	NaDONA0922	0.021	2.12	0.017	47.1	1.00	0.05	919005-14-4	N/A	N/A
	Perfluorooctanoic acid (linear)*	99202	080522	0.02	2.00	0.004	49.6	0.99	0.010	335-67-1 (L)	N/A	ipr-rat 189mg/kg
	Perfluorooctanoic acid (branched isomer)*	99202	080522	0.02	2.00	0.004	0.6	0.01	0.001	335-67-1 (L)	N/A	ipr-rat 189mg/kg
	Perfluorohexanesulfonic acid (linear)*	99198	071522	0.02	2.00	0.017	44.2	0.88	0.02	355-46-4 (L)	N/A	N/A
	Perfluorohexanesulfonic acid (branched isomer)*	99198	071522	0.02	2.00	0.017	6.0	0.12	0.0021	355-46-4 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (linear)*	99201	033022	0.02	2.00	0.017	38.1	0.76	0.02	1763-23-1 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	7.5	0.15	0.003	1763-23-1 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	4.0	0.08	0.002	1763-23-1 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	0.5	0.010	0.0002	1763-23-1 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (linear)*	4162	brNMeFOSAA0422	0.02	2.00	0.017	36.0	0.72	0.04	2355-31-9 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0422	0.02	2.00	0.017	6.5	0.13	0.011	2355-31-9 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0422	0.02	2.00	0.017	5.0	0.10	0.005	2355-31-9 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0422	0.02	2.00	0.017	2.5	0.05	0.0009	2355-31-9 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (linear)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	38.6	0.73	0.04	2991-50-6 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	7.7	0.15	0.009	2991-50-6 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	5.3	0.11	0.005	2991-50-6 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	0.4	0.007	0.0008	2991-50-6 (L)	N/A	N/A

*Concentrations for branched and linear isomers are based on LCMS chromatographic analysis only.

A qualitative standard (Sect. 3.19) is available for PFOA that contains the linear and branched isomers (Wellington Labs, Cat. No. T-PFOA, or equivalent). This qualitative PFOA standard must be purchased and used to identify the retention times of the branched PFOA isomers, but the linear only PFOA standard must be used for quantitation (Sect. 12.2) until a quantitative PFOA standard containing the branched and linear isomers becomes commercially available.1

- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.
- Uncertainty Reference: Taylor, B.N. and Kuyal, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC, (1994).

Absolute Standards, Inc.
800-368-1131
www.absolutestandards.com

Certified Reference Material CRM

230113-02

ANAB ISO 17034 Accredited
AR-1539 Certificate Number
https://Absolutestandards.com

CERTIFIED WEIGHT REPORT

Part Number:	64029				
Lot Number:	080522	**Solvent(s):**	**Lot#**		
Description:	PFOA - DOD	Methanol (1 mM KOH)	042722	(98%)	
	28 components	2-Propanol	23214	(2%)	
Expiration Date:	080527				
Recommended Storage:	Freezer (0 °C)				
Nominal Concentration (µg/mL):	1.0				
NIST Test ID#:	6UTB	5E-05	Balance Uncertainty		
Volume(s) shown below were combined and diluted to (mL):		100.0	0.012	Flask Uncertainty	

Formulated By: Prashant Chauhan 080522 DATE

Reviewed By: Pedro L. Rentas 080522 DATE

Note: All assigned values are anion concentrations.

	Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Initial Conc.(µg/mL)	Final Conc.(µg/mL)	Expanded Uncertainty (+/-) µg/mL	SDS Information (Solvent Safety Info. On Attached pg.) Free Acid CAS#	OSHA PEL (TWA)	LD50
1.	Perfluoro-n-butanoic acid (PFBA)	99542	021022	0.02	2.00	0.017	50.1	1.00	0.02	375-22-4	N/A	N/A
2.	Perfluoro-n-pentanoic acid (PFPeA)	99543	050222	0.02	2.00	0.017	50.3	1.01	0.02	2706-90-3	N/A	N/A
3.	Perfluorohexanoic acid (PFHxA)	99199	071122	0.02	2.00	0.017	50.2	1.00	0.02	307-24-4	N/A	N/A
4.	Perfluoroheptanoic acid (PFHpA)	99197	040522	0.02	2.00	0.017	50.1	1.00	0.02	375-85-9	N/A	N/A
5.	Perfluorooctanoic acid (br-PFOA)*	99202	080522	0.02	2.00	0.017	50.2	1.00	0.02	335-67-1 (L)	N/A	ipr-rat 189mg/kg
6.	Perfluorononanoic acid (PFNA)	99200	050222	0.02	2.00	0.017	50.1	1.00	0.02	375-95-1	N/A	N/A
7.	Perfluorodecanoic acid (PFDA)	99195	041822	0.02	2.00	0.017	50.0	1.00	0.02	335-76-2	N/A	orl-rat 57mg/kg
8.	Perfluoroundecanoic acid (PFUnA)	99205	071522	0.02	2.00	0.017	50.2	1.00	0.02	2058-94-8	N/A	N/A
9.	Perfluorododecanoic acid (PFDoA)	99196	071522	0.02	2.00	0.017	50.1	1.00	0.02	307-55-1	N/A	N/A
10.	Perfluorotridecanoic acid (PFTrDA)	99204	021022	0.02	2.00	0.017	50.1	1.00	0.02	72629-94-8	N/A	N/A
11.	Perfluorotetradecanoic acid (PFTeDA)	99203	033022	0.02	2.00	0.017	50.1	1.00	0.02	376-06-7	N/A	N/A
12.	Perfluoro-1-octanesulfonamide (FOSA)	3677	FOSA0322I	0.02	2.00	0.017	50.0	1.00	0.05	754-91-6	N/A	N/A
13.	N-Methylperfluorooctanesulfonamidoacetic acid (br-NMeFOSAA)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	50.0	1.00	0.05	2355-31-9 (L)	N/A	N/A
14.	N-Ethylperfluorooctanesulfonamidoacetic acid (br-NEtFOSAA)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	50.0	1.00	0.05	2991-50-6 (L)	N/A	N/A
15.	Perfluorobutanesulfonic acid (PFBS)	99194	080522	0.02	2.00	0.017	50.2	1.00	0.02	375-73-5	N/A	N/A
16.	Perfluoro-1-pentanesulfonic acid (PFPeS)	99544	032422	0.02	2.00	0.017	50.1	1.00	0.02	2706-91-4	N/A	N/A
17.	Perfluorohexanesulfonic acid (br-PFHxS)*	99198	071522	0.02	2.00	0.017	50.2	1.00	0.02	355-46-4 (L)	N/A	N/A
18.	Perfluoro-1-heptanesulfonic acid (PFHpS)	3672	LPFHpS0122	0.021	2.10	0.017	47.6	1.00	0.05	375-92-8	N/A	N/A
19.	Heptadecafluorooctanesulfonic acid (br-PFOS)*	99201	033022	0.02	2.00	0.017	50.1	1.00	0.02	1763-23-1 (L)	N/A	N/A
20.	Perfluoro-1-nonanesulfonic acid (PFNS)	3957	LPFNS0422	0.021	2.10	0.017	48.0	1.01	0.05	68259-12-1	N/A	N/A
21.	Perfluoro-1-decanesulfonic acid (PFDS)	3671	LPFDS0222	0.021	2.10	0.017	48.2	1.01	0.05	335-77-3	N/A	N/A
22.	1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	65271	080522	0.02	2.00	0.017	50.2	1.00	0.05	757124-72-4	N/A	N/A
23.	1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	65272	071522	0.02	2.00	0.017	50.2	1.00	0.05	27619-97-2	N/A	N/A
24.	1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	3662	82FTS0122	0.021	2.10	0.017	47.9	1.01	0.05	39108-34-4	N/A	N/A
25.	2-(Heptafluoropropoxy)-2,3,3,3-tetrafluoropropionic acid (HFPO-DA)	99668	080522	0.02	2.00	0.017	50.1	1.00	0.02	13252-13-6	N/A	N/A
26.	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	4165	11ClPF3OUdS0222	0.021	2.12	0.017	47.1	1.00	0.05	763051-92-9	N/A	N/A
27.	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	4164	9ClPF3ONS0522	0.021	2.14	0.017	48.6	1.00	0.05	756426-58-1	N/A	N/A
28.	Dodecafluoro-3H-4,8-dioxanonanoic acid (ADONA)	4103	NaDONA0422	0.021	2.12	0.017	47.1	1.00	0.05	919005-14-4	N/A	N/A
	Perfluorooctanoic acid (linear)*	99202	080522	0.02	2.00	0.004	49.6	0.99	0.010	335-67-1 (L)	N/A	ipr-rat 189mg/kg
	Perfluorooctanoic acid (branched isomer)*	99202	080522	0.02	2.00	0.004	0.6	0.01	0.001	335-67-1 (L)	N/A	ipr-rat 189mg/kg
	Perfluorohexanesulfonic acid (linear)*	99198	071522	0.02	2.00	0.017	44.2	0.88	0.02	355-46-4 (L)	N/A	N/A
	Perfluorohexanesulfonic acid (branched isomer)*	99198	071522	0.02	2.00	0.017	6.0	0.12	0.0021	355-46-4 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (linear)*	99201	033022	0.02	2.00	0.017	38.1	0.76	0.02	1763-23-1 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	7.5	0.15	0.003	1763-23-1 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	4.0	0.08	0.002	1763-23-1 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	0.5	0.010	0.0002	1763-23-1 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (linear)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	36.0	0.72	0.04	2355-31-9 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	6.5	0.13	0.011	2355-31-9 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	5.0	0.10	0.005	2355-31-9 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	2.5	0.05	0.0009	2355-31-9 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (linear)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	36.6	0.73	0.04	2991-50-6 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	7.7	0.15	0.009	2991-50-6 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	5.3	0.11	0.005	2991-50-6 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	0.4	0.007	0.0006	2991-50-6 (L)	N/A	N/A

*Concentrations for branched and linear isomers are based on LCMS chromatographic analysis only.

A qualitative standard (Sect. 3.19) is available for PFOA that contains the linear and branched isomers (Wellington Labs, Cat. No. T-PFOA, or equivalent). This qualitative PFOA standard must be purchased and used to identify the retention times of the branched PFOA isomers, but the linear only PFOA standard must be used for quantitation (Sect. 12.2) until a quantitative PFOA standard containing the branched and linear isomers becomes commercially available.1

- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- All Standards, after opening ampoule, should be stored with caps tight and under appropriate laboratory conditions.
- Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result." NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC, (1994).

BATTELLE
It can be done

BDO Id: 230113-02

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name: PFOA-DoD
Vendor: ABSOLUTE STANDARDS
Catalogue No: 64029
Type: Solution
Lot No: 080522
Quantity: 10 ea ampoules **% Moisture:**
Description: PFOA-DoD

Received: 1/13/2023
Custodian: Beal, Hayley
Expires: 8/5/2027
Consumed:
Stored In: LC Laboratory #2 - F0111

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
11-chloroeicosafluoro-3-oxaundecan	763051-92-9	1.0000	100.00	--	--	☐			
1H,1H,2H,2H-Perfluorodecane sulfo	39108-34-4	1.0100	100.00	--	--	☐			
1H,1H,2H,2H-Perfluorohexane sulfon	757124-72-4	1.0000	100.00	--	--	☐			
1H,1H,2H,2H-Perfluorooctane sulfon	27619-97-2	1.0000	100.00	--	--	☐			
9-chlorohexadecafluoro-3-oxanonane	756426-58-1	1.0000	100.00	--	--	☐			
Adona	919005-14-4	1.0000	100.00	--	--	☐			
Hexafluoropropylene oxide dimer aci	13252-13-6	1.0000	100.00	--	--	☐			
N-ethylperfluoro-octanesulfonamidoa	2991-50-6	1.0000	100.00	--	--	☐			
N-methylperfluoro-1-octanesulfonami	2355-31-9	1.0000	100.00	--	--	☐			
Perfluoro-1-butanesulfonate	375-73-5	1.0000	100.00	--	--	☐			
Perfluoro-1-decanesulfonate	335-77-3	1.0100	100.00	--	--	☐			
Perfluoro-1-heptanesulfonate	375-92-8	1.0000	100.00	--	--	☐			
Perfluoro-1-hexanesulfonate	355-46-4	1.0000	100.00	--	--	☐			
Perfluoro-1-nonanesulfonate	68259-12-1	1.0100	100.00	--	--	☐			
Perfluoro-1-octanesulfonamide	754-91-6	1.0000	100.00	--	--	☐			
Perfluoro-1-octanesulfonate	1763-23-1	1.0000	100.00	--	--	☐			
perfluoro-1-pentanesulfonate	2706-91-4	1.0000	100.00	--	--	☐			
Perfluoro-n-butanoic Acid	375-22-4	1.0000	100.00	--	--	☐			
Perfluoro-n-decanoic Acid	335-76-2	1.0000	100.00	--	--	☐			
Perfluoro-n-dodecanoic acid	307-55-1	1.0000	100.00	--	--	☐			
Perfluoro-n-heptanoic Acid	375-85-9	1.0000	100.00	--	--	☐			
Perfluoro-n-hexanoic acid	307-24-4	1.0000	100.00	--	--	☐			
Perfluoro-n-octanoic Acid	335-67-1	1.0000	100.00	--	--	☐			
Perfluorononanoic Acid	375-95-1	1.0000	100.00	--	--	☐			
Perfluoro-n-pentanoic acid	2706-90-3	1.0100	100.00	--	--	☐			
Perfluoro-n-tetradecanoic acid	376-06-7	1.0000	100.00	--	--	☐			
Perfluoro-n-tridecanoic acid	72629-94-8	1.0000	100.00	--	--	☐			
Perfluoro-n-undecanoic acid	2058-94-8	1.0000	100.00	--	--	☐			

Total Analytes: 28

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

Absolute Standards, Inc.
800-368-1131
www.absolutestandards.com

Certified Reference Material CRM

230113-02

ANAB ISO 17034 Accredited
AR-1539 Certificate Number
https://Absolutestandards.com

CERTIFIED WEIGHT REPORT

Part Number:	64029				
Lot Number:	080522	**Solvent(s):**	**Lot#**		
Description:	PFOA - DOD	Methanol (1 mM KOH)	042722	(98%)	
	28 components	2-Propanol	23214	(2%)	
Expiration Date:	080527				
Recommended Storage:	Freezer (0 °C)				
Nominal Concentration (µg/mL):	1.0				
NIST Test ID#:	6UTB	5E-05	Balance Uncertainty		
Volume(s) shown below were combined and diluted to (mL):		100.0	0.012	Flask Uncertainty	

Formulated By: Prashant Chauhan 080522 DATE

Reviewed By: Pedro L. Rentas 080522 DATE

Note: All assigned values are anion concentrations.

	Compound	Part Number	Lot Number	Dilution Factor	Intial Vol. (mL)	Uncertainty Pipette (mL)	Initial Conc.(µg/mL)	Final Conc.(µg/mL)	Expanded Uncertainty (+/-) µg/mL	SDS Information (Solvent Safety Info. On Attached pg.) Free Acid CAS#	OSHA PEL (TWA)	LD50
1.	Perfluoro-n-butanoic acid (PFBA)	99542	021022	0.02	2.00	0.017	50.1	1.00	0.02	375-22-4	N/A	N/A
2.	Perfluoro-n-pentanoic acid (PFPeA)	99543	050222	0.02	2.00	0.017	50.3	1.01	0.02	2706-90-3	N/A	N/A
3.	Perfluorohexanoic acid (PFHxA)	99199	071122	0.02	2.00	0.017	50.2	1.00	0.02	307-24-4	N/A	N/A
4.	Perfluoroheptanoic acid (PFHpA)	99197	040522	0.02	2.00	0.017	50.1	1.00	0.02	375-85-9	N/A	N/A
5.	Perfluorooctanoic acid (br-PFOA)*	99202	080522	0.02	2.00	0.017	50.2	1.00	0.02	335-67-1 (L)	N/A	ipr-rat 189mg/kg
6.	Perfluorononanoic acid (PFNA)	99200	050222	0.02	2.00	0.017	50.1	1.00	0.02	375-95-1	N/A	N/A
7.	Perfluorodecanoic acid (PFDA)	99195	041822	0.02	2.00	0.017	50.0	1.00	0.02	335-76-2	N/A	orl-rat 57mg/kg
8.	Perfluoroundecanoic acid (PFUnA)	99205	071522	0.02	2.00	0.017	50.2	1.00	0.02	2058-94-8	N/A	N/A
9.	Perfluorododecanoic acid (PFDoA)	99196	071522	0.02	2.00	0.017	50.1	1.00	0.02	307-55-1	N/A	N/A
10.	Perfluorotridecanoic acid (PFTrDA)	99204	021022	0.02	2.00	0.017	50.1	1.00	0.02	72629-94-8	N/A	N/A
11.	Perfluorotetradecanoic acid (PFTeDA)	99203	033022	0.02	2.00	0.017	50.1	1.00	0.02	376-06-7	N/A	N/A
12.	Perfluoro-1-octanesulfonamide (FOSA)	3677	FOSA0322I	0.02	2.00	0.017	50.0	1.00	0.05	754-91-6	N/A	N/A
13.	N-Methylperfluorooctanesulfonamidoacetic acid (br-NMeFOSAA)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	50.0	1.00	0.05	2355-31-9 (L)	N/A	N/A
14.	N-Ethylperfluorooctanesulfonamidoacetic acid (br-NEtFOSAA)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	50.0	1.00	0.05	2991-50-6 (L)	N/A	N/A
15.	Perfluorobutanesulfonic acid (PFBS)	99194	080522	0.02	2.00	0.017	50.2	1.00	0.02	375-73-5	N/A	N/A
16.	Perfluoro-1-pentanesulfonic acid (PFPeS)	99544	032422	0.02	2.00	0.017	50.1	1.00	0.02	2706-91-4	N/A	N/A
17.	Perfluorohexanesulfonic acid (br-PFHxS)*	99196	071522	0.02	2.00	0.017	50.2	1.00	0.02	355-46-4 (L)	N/A	N/A
18.	Perfluoro-1-heptanesulfonic acid (PFHpS)	3672	LPFHpS0122	0.021	2.10	0.017	47.6	1.00	0.05	375-92-8	N/A	N/A
19.	Heptadecafluorooctanesulfonic acid (br-PFOS)*	99201	033022	0.02	2.00	0.017	50.1	1.00	0.02	1763-23-1 (L)	N/A	N/A
20.	Perfluoro-1-nonanesulfonic acid (PFNS)	3957	LPFNS0422	0.021	2.10	0.017	48.0	1.01	0.05	68259-12-1	N/A	N/A
21.	Perfluoro-1-decanesulfonic acid (PFDS)	3671	LPFDS0222	0.021	2.10	0.017	48.2	1.01	0.05	335-77-3	N/A	N/A
22.	1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	65271	080522	0.02	2.00	0.017	50.2	1.00	0.05	757124-72-4	N/A	N/A
23.	1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	65272	071522	0.02	2.00	0.017	50.2	1.00	0.05	27619-97-2	N/A	N/A
24.	1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	3662	82FTS0122	0.021	2.10	0.017	47.9	1.01	0.05	39108-34-4	N/A	N/A
25.	2-(Heptafluoropropoxy)-2,3,3,3-tetrafluoropropionic acid (HFPO-DA)	99666	080522	0.02	2.00	0.017	50.1	1.00	0.02	13252-13-6	N/A	N/A
26.	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	4165	11ClPF3OUdS0222	0.021	2.12	0.017	47.1	1.00	0.05	763051-92-9	N/A	N/A
27.	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	4164	9ClPF3ONS0522	0.021	2.14	0.017	48.6	1.00	0.05	756426-58-1	N/A	N/A
28.	Dodecafluoro-3H-4,6-dioxanonanoic acid (ADONA)	4103	NaDONA0422	0.021	2.12	0.017	47.1	1.00	0.05	919005-14-4	N/A	N/A
	Perfluorooctanoic acid (linear)*	99202	080522	0.02	2.00	0.004	49.6	0.99	0.010	335-67-1 (L)	N/A	ipr-rat 189mg/kg
	Perfluorooctanoic acid (branched isomer)*	99202	080522	0.02	2.00	0.004	0.6	0.01	0.001	335-67-1 (L)	N/A	ipr-rat 189mg/kg
	Perfluorohexanesulfonic acid (linear)*	99196	071522	0.02	2.00	0.017	44.2	0.88	0.02	355-46-4 (L)	N/A	N/A
	Perfluorohexanesulfonic acid (branched isomer)*	99196	071522	0.02	2.00	0.017	6.0	0.12	0.0021	355-46-4 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (linear)*	99201	033022	0.02	2.00	0.017	38.1	0.76	0.02	1763-23-1 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	7.5	0.15	0.003	1763-23-1 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	4.0	0.08	0.002	1763-23-1 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	0.5	0.010	0.0002	1763-23-1 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (linear)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	36.0	0.72	0.04	2355-31-9 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	6.5	0.13	0.011	2355-31-9 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	5.0	0.10	0.005	2355-31-9 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	2.5	0.05	0.0009	2355-31-9 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (linear)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	36.6	0.73	0.04	2991-50-6 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	7.7	0.15	0.009	2991-50-6 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	5.3	0.11	0.005	2991-50-6 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	0.4	0.007	0.0006	2991-50-6 (L)	N/A	N/A

*Concentrations for branched and linear isomers are based on LCMS chromatographic analysis only.

A qualitative standard (Sect. 3.19) is available for PFOA that contains the linear and branched isomers (Wellington Labs, Cat. No. T-PFOA, or equivalent). This qualitative PFOA standard must be purchased and used to identify the retention times of the branched PFOA isomers, but the linear only PFOA standard must be used for quantitation (Sect. 12.2) until a quantitative PFOA standard containing the branched and linear isomers becomes commercially available.1

- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.
- Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result." NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC, (1994).

BATTELLE
It can be done

BDO Id: 230124-01

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	d-N-MeFOSA-M	**Received:**	1/24/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	dNMeFOSA1122M	**Expires:**	11/11/2027
Type:	Solution	**Consumed:**	
Lot No:	dNMeFOSA1122M	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	d-N-MeFOSA-M		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
d3-MeFOSA	BDO-2370	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230124-01

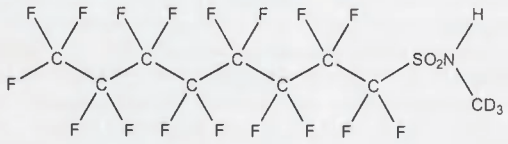
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d-N-MeFOSA-M
COMPOUND: N-Methyl-d_3-perfluoro-1-octanesulfonamide
LOT NUMBER: dNMeFOSA1122M

STRUCTURE:

CAS #: 936109-37-4



MOLECULAR FORMULA:	$C_9D_3HF_{17}NO_2S$	**MOLECULAR WEIGHT:**	516.19
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	11/11/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/11/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/14/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BDO Id: 230124-02

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	FPrPA	**Received:**	1/24/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	FPrPA0122	**Expires:**	2/3/2027
Type:	Solution	**Consumed:**	
Lot No:	FPrPA0122	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule	**% Moisture:**	
Description:	FPrPA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
3-perfluoropropyl propanoic Acid	356-02-5	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230124-02

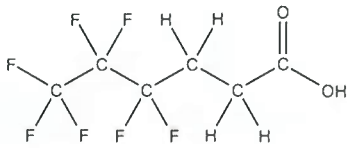
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FPrPA
COMPOUND: 3-Perfluoropropyl propanoic acid
LOT NUMBER: FPrPA0122

STRUCTURE:

CAS #: 356-02-5



MOLECULAR FORMULA:	$C_6H_5F_7O_2$	**MOLECULAR WEIGHT:**	242.09
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	02/03/2022		
EXPIRY DATE: (mm/dd/yyyy)	02/03/2027		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

- Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
  Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains <1% of the unsaturated 3:3 telomer acid ($C_6H_3F_7O_2$) as an impurity determined by ^{19}F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim, General Manager **Date:** 02/04/2022 (mm/dd/yyyy)

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It can be done

BDO Id: 230124-03

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	FPePA	**Received:**	1/24/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	FPePA1122	**Expires:**	11/21/2027
Type:	Solution	**Consumed:**	
Lot No:	FPePA1122	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	FPePA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
3-Perfluoropentyl propanoic acid	914637-49-3	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

WELLINGTON LABORATORIES

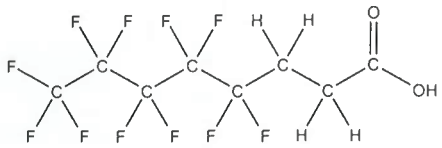
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FPePA
COMPOUND: 3-Perfluoropentyl propanoic acid

LOT NUMBER: FPePA1122

STRUCTURE:

CAS #: 914637-49-3



MOLECULAR FORMULA:	$C_8H_5F_{11}O_2$	**MOLECULAR WEIGHT:**	342.11
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	11/21/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/21/2027		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains <0.5% of the unsaturated 5:3 telomer acid ($C_8H_3F_{11}O_2$) as an impurity determined by ^1H and ^{19}F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/23/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

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BATTELLE
It can be done

BDO Id: 230124-04

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	FHpPA	**Received:**	1/24/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	FHpPA1122	**Expires:**	11/21/2027
Type:	Solution	**Consumed:**	
Lot No:	FHpPA1122	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	FHpPA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
3-Perfluoroheptyl propanoic acid	812-70-4	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230124-04

WELLINGTON LABORATORIES

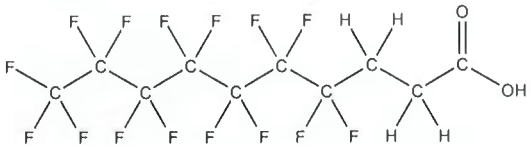
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: FHpPA
COMPOUND: 3-Perfluoroheptyl propanoic acid

LOT NUMBER: FHpPA1122

STRUCTURE:

CAS #: 812-70-4



MOLECULAR FORMULA:	$C_{10}H_5F_{15}O_2$	**MOLECULAR WEIGHT:**	442.12
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	11/21/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/21/2027		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.1% of 3-perfluorohexyl propanoic acid (6:3 telomer acid) and ~0.2% of perfluoro-n-heptanoic acid (PFHpA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/24/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230124-05

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	d7-N-MeFOSE-M	**Received:**	1/24/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	d7NMeFOSE1222M	**Expires:**	12/16/2027
Type:	Solution	**Consumed:**	
Lot No:	d7NMeFOSE1222M	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	d7-N-MeFOSE-M		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
d7-MeFOSE	1265205-95-5	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230124-05

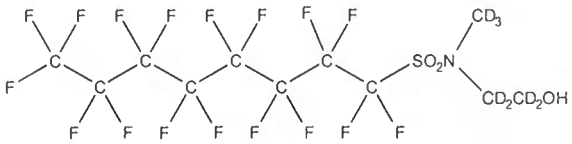
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d7-N-MeFOSE-M **LOT NUMBER:** d7NMeFOSE1222M

COMPOUND: 2-(N-methyl-d3-perfluoro-1-octanesulfonamido)ethan-d4-ol

STRUCTURE: **CAS #:** 1265205-95-5



MOLECULAR FORMULA:	$C_{11}D_7HF_{17}NO_3S$	**MOLECULAR WEIGHT:**	564.27
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_7$
LAST TESTED: (mm/dd/yyyy)	12/16/2022 (HRGC/LRMS) 12/05/2022 (LC/MS)		
EXPIRY DATE: (mm/dd/yyyy)	12/16/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS Data (Full Scan and Mass Spectrum)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- In order to see the molecular ion (adduct free), the LC mobile phase should be free of ammonium acetate buffer.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/16/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230124-06

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	d9-N-EtFOSE-M	**Received:**	1/24/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	d9NEtFOSE1221M	**Expires:**	1/27/2027
Type:	Solution	**Consumed:**	
Lot No:	d9NEtFOSE1221M	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	d9-N-EtFOSE-M		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
d9-EtFOSE	BDO-2386	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230124-06

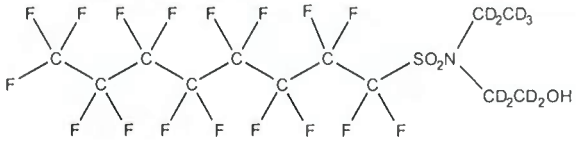
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d9-N-EtFOSE-M **LOT NUMBER:** d9NEtFOSE1221M

COMPOUND: 2-(N-ethyl-d5-perfluoro-1-octanesulfonamido)ethan-d4-ol

STRUCTURE: **CAS #:** 1265205-96-6



MOLECULAR FORMULA:	$C_{12}D_9HF_{17}NO_3S$	**MOLECULAR WEIGHT:**	580.31
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_9$
LAST TESTED: (mm/dd/yyyy)	12/13/2021 (HRGC/LRMS) 01/27/2022 (LC/MS)		
EXPIRY DATE: (mm/dd/yyyy)	01/27/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS Data (Full Scan and Mass Spectrum)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- In order to see the molecular ion (adduct free), the LC mobile phase should be free of ammonium acetate buffer.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 02/03/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230124-09

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	d-N-EtFOSA-M	**Received:**	1/24/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	dNEtFOSA1022M	**Expires:**	11/7/2027
Type:	Solution	**Consumed:**	
Lot No:	dNEtFOSA1022M	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	d-N-EtFOSA-M		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
d5-EtFOSA	BDO-2371	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

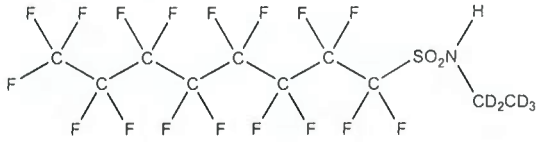
Authorized by: _____ **Authorized on:** _____

230124-09

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	d-N-EtFOSA-M	**LOT NUMBER:**	dNEtFOSA1022M
COMPOUND:	N-Ethyl-d_5-perfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	936109-40-9



MOLECULAR FORMULA:	$C_{10}D_5HF_{17}NO_2S$	**MOLECULAR WEIGHT:**	532.23
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy)	11/07/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/07/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.3% of an unknown isomeric impurity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/08/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230210-03

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C4-PFBA	**Received:**	2/10/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	13C4-PFBA	**Expires:**	5/19/2027
Type:	Solution	**Consumed:**	
Lot No:	MPFBA0522	**Stored In:**	VOC Laboratory - R0121
Quantity:	2 ea Ampoules **% Moisture:**		
Description:	13C4-PFBA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C4-PFBA	BDO-2105	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230210-03

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFBA	**LOT NUMBER:**	MPFBA0522
COMPOUND:	Perfluoro-n-(1,2,3,4-$^{13}C_4$)butanoic acid		
STRUCTURE:		**CAS #:**	1017281-29-6

MOLECULAR FORMULA:	$^{13}C_4HF_7O_2$	**MOLECULAR WEIGHT:**	218.01
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	05/19/2022		
EXPIRY DATE: (mm/dd/yyyy)	05/19/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/25/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230210-04

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C5-PFPeA	**Received:**	2/10/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	13C5-PFPeA	**Expires:**	10/4/2027
Type:	Solution	**Consumed:**	
Lot No:	M5PFPeA0922	**Stored In:**	VOC Laboratory - R0121
Quantity:	2 ea Ampoules **% Moisture:**		
Description:	13C5-PFPeA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C5-PFPeA	BDO-2216	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230210-04

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M5PFPeA	**LOT NUMBER:**	M5PFPeA0922
COMPOUND:	Perfluoro-n-($^{13}C_5$)pentanoic acid		
STRUCTURE:		**CAS #:**	2283397-79-3

MOLECULAR FORMULA:	$^{13}C_5HF_9O_2$	**MOLECULAR WEIGHT:**	269.01
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	10/04/2022		
EXPIRY DATE: (mm/dd/yyyy)	10/04/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/31/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230210-05

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C8-FOSA-I	**Received:**	2/10/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	13C8-FOSA-I	**Expires:**	8/16/2027
Type:	Solution	**Consumed:**	
Lot No:	M8FOSA08221	**Stored In:**	VOC Laboratory - R0121
Quantity:	2 ea Ampoules **% Moisture:**		
Description:	13C8-FOSA-I		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C8-FOSA	BDO-2225	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

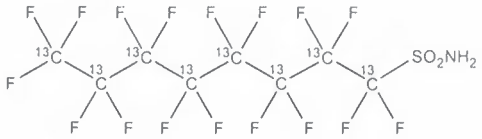
Authorized by: _____ **Authorized on:** _____

230210-05

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M8FOSA-I	**LOT NUMBER:**	M8FOSA0822I
COMPOUND:	Perfluoro-1-($^{13}C_8$)octanesulfonamide		
STRUCTURE:		**CAS #:**	1365803-60-6



MOLECULAR FORMULA:	$^{13}C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	507.09
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	08/16/2022		
EXPIRY DATE: (mm/dd/yyyy)	08/16/2027		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.9% of perfluoro-1-($^{13}C_4$)octanesulfonamide and ~0.2% of perfluoro-1-($^{13}C_7$)heptanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/25/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230210-06

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C2-6:2FTS	**Received:**	2/10/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	13C2-6:2FTS	**Expires:**	11/24/2027
Type:	Solution	**Consumed:**	
Lot No:	M262FTS1122	**Stored In:**	VOC Laboratory - R0121
Quantity:	2 ea Ampoules **% Moisture:**		
Description:	13C2-6:2FTS		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C2-6:2FTS	BDO-2230	47.6000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	13C2-6:2FTS	Acid

Approved by: _____ **Approved on:** _____

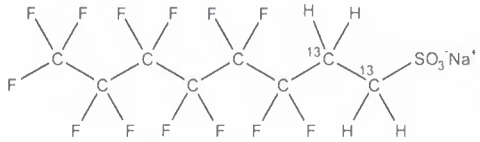
Authorized by: _____ **Authorized on:** _____

230210-06

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	M2-6:2FTS	**LOT NUMBER:**	M262FTS1122
COMPOUND:	Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)octanesulfonate		
STRUCTURE:		**CAS #:**	2708218-89-5



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	452.13
CONCENTRATION:	50.0 ± 2.5 µg/mL (Na salt) 47.6 ± 2.4 µg/mL (M2-6:2FTS acid) 47.5 ± 2.4 µg/mL (M2-6:2FTS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/24/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/24/2027		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 6:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/13/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230210-07

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C2-8:2FTS	**Received:**	2/10/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	13C2-8:2FTS	**Expires:**	11/10/2027
Type:	Solution	**Consumed:**	
Lot No:	M282FTS1122	**Stored In:**	VOC Laboratory - R0121
Quantity:	2 ea Ampoules **% Moisture:**		
Description:	13C2-8:2FTS		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C2-8:2FTS	BDO-2220	48.0000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	13C2-8:2FTS	Acid

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

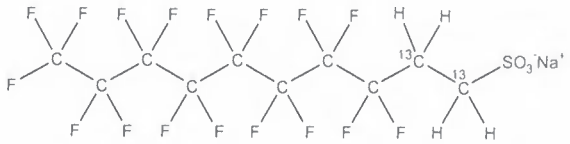
230210-07

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-8:2FTS
LOT NUMBER: M282FTS1122
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)decanesulfonate

STRUCTURE:
CAS #: 2708218-90-8



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$
MOLECULAR WEIGHT: 552.15
CONCENTRATION: 50.0 ± 2.5 µg/mL (Na salt)
48.0 ± 2.4 µg/mL (M2-8:2FTS acid)
47.9 ± 2.4 µg/mL (M2-8:2FTS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 11/10/2022
EXPIRY DATE: (mm/dd/yyyy) 11/10/2027
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 8:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/18/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230210-08

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C2-4:2FTS	**Received:**	2/10/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	13C2-4:2FTS	**Expires:**	9/15/2027
Type:	Solution	**Consumed:**	
Lot No:	M242FTS0922	**Stored In:**	VOC Laboratory - R0121
Quantity:	2 ea Ampoules **% Moisture:**		
Description:	13C2-4:2FTS		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C2-4:2FTS	BDO-2229	46.9000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	13C2-4:2FTS	Acid

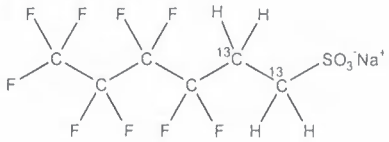
Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230210-08

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2-4:2FTS	**LOT NUMBER:**	M242FTS0922
COMPOUND:	Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)hexanesulfonate		
STRUCTURE:		**CAS #:**	2708218-88-4
MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_4H_4F_9SO_3Na$	**MOLECULAR WEIGHT:**	352.12
CONCENTRATION:	50.0 ± 2.5 µg/mL (Na salt) 46.9 ± 2.3 µg/mL (M2-4:2FTS acid) 46.7 ± 2.3 µg/mL (M2-4:2FTS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	09/15/2022		
EXPIRY DATE: (mm/dd/yyyy)	09/15/2027		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 4:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 4:2FTS and M2-4:2FTS will produce signals in the m/z 329 to m/z 309 channel during SRM analysis. We recommend using the m/z 329 to m/z 81 transition to monitor for M2-4:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/18/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230306-07

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C4-PFOS	**Received:**	3/6/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	MPFOS	**Expires:**	11/8/2027
Type:	Solution	**Consumed:**	
Lot No:	MPFOS1022	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea Ampoule **% Moisture:**		
Description:	Sodium perfluoro-1-(1,2,3,4-13C4)octanesulfonate		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C4-PFOS	BDO-2121	47.9000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	13C4-PFOS	Acid Concentration

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230306-07

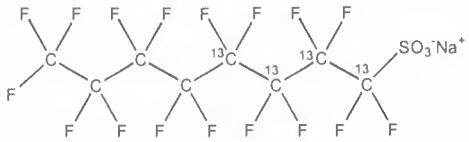
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS1022

COMPOUND: Sodium perfluoro-1-(1,2,3,4-$^{13}C_4$)octanesulfonate

STRUCTURE: **CAS #:** 960315-53-1



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
CONCENTRATION:	50.0 ± 2.5 µg/mL (Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/mL (MPFOS acid)		
	47.8 ± 2.4 µg/mL (MPFOS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	11/08/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/08/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.7% of perfluoro-n-($^{13}C_4$)octanoic acid (MPFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/11/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

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BATTELLE
It can be done

BDO Id: 230306-08

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name: 13C3-HFPO-DA
Vendor: Wellington Laboratories
Catalogue No: M3HFPO-DA
Type: Solution
Lot No: M3HFPODA1022
Quantity: 1 ea Ampoule **% Moisture:**
Description: 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)(13C3)propanoic acid

Received: 3/6/2023
Custodian: Fuhry, Paul
Expires: 11/8/2025
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C3-HFPO-DA	BDO-2276	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230306-08

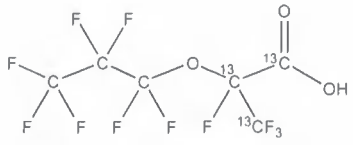
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M3HFPO-DA **LOT NUMBER:** M3HFPODA1022

COMPOUND: 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)($^{13}C_3$)propanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_3{}^{12}C_3HF_{11}O_3$	**MOLECULAR WEIGHT:**	333.03
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	11/08/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/08/2025		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Product is commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/10/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230306-09

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	d3-N-MeFOSAA	**Received:**	3/6/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	d3-N-MeFOSAA	**Expires:**	10/18/2027
Type:	Solution	**Consumed:**	
Lot No:	d3NMeFOSAA1022	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea Ampoule **% Moisture:**		
Description:	N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
d3-MeFOSAA	BDO-1838	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

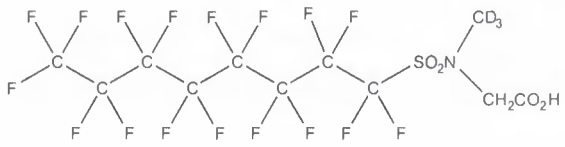
Authorized by: _____ **Authorized on:** _____

230306-09

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	d3-N-MeFOSAA	**LOT NUMBER:**	d3NMeFOSAA1022
COMPOUND:	N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid		
STRUCTURE:		**CAS #:**	1400690-70-1



MOLECULAR FORMULA:	$C_{11}D_3H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	574.23
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	10/18/2022		
EXPIRY DATE: (mm/dd/yyyy)	10/18/2027		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/24/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230306-10

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	d5-N-EtFOSAA	**Received:**	3/6/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	d5-N-EtFOSAA	**Expires:**	12/30/2027
Type:	Solution	**Consumed:**	
Lot No:	d5NEtFOSAA1222	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea Ampoule **% Moisture:**		
Description:	N-Ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
d5-EtFOSAA	BDO-1839	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230306-10

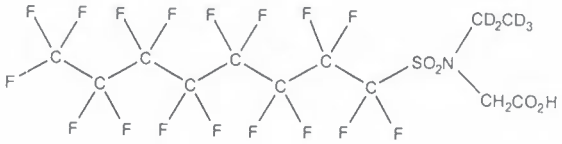
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA
LOT NUMBER: d5NEtFOSAA1222
COMPOUND: N-Ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #: 1265205-97-7



MOLECULAR FORMULA: $C_{12}D_5H_3F_{17}NO_4S$
MOLECULAR WEIGHT: 590.26
CONCENTRATION: 50.0 ± 2.5 µg/mL
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy) 12/30/2022
EXPIRY DATE: (mm/dd/yyyy) 12/30/2027
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim, General Manager **Date:** 01/13/2023 (mm/dd/yyyy)

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BATTELLE
It can be done

BDO Id: 230306-11

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C3-PFBS	**Received:**	3/6/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	M3PFBS	**Expires:**	11/21/2027
Type:	Solution	**Consumed:**	
Lot No:	M3PFBS1122	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea Ampoule **% Moisture:**		
Description:	Sodium perfluoro-1-(2,3,4-13C3)butanesulfonate		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C3-PFBS	BDO-2226	46.6000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	13C3-PFBS	Acid Concentration

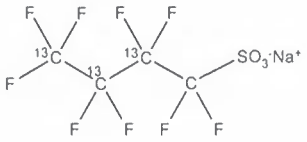
Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M3PFBS	**LOT NUMBER:**	M3PFBS1122
COMPOUND:	Sodium perfluoro-1-(2,3,4-$^{13}C_3$)butanesulfonate		
STRUCTURE:		**CAS #:**	2708218-84-0



MOLECULAR FORMULA:	$^{13}C_3{}^{12}CF_9SO_3Na$	**MOLECULAR WEIGHT:**	325.06
CONCENTRATION:	50.0 ± 2.5 µg/mL (Na salt) 46.6 ± 2.3 µg/mL (M3PFBS acid) 46.5 ± 2.3 µg/mL (M3PFBS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($2,3,4\text{-}^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	11/21/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/21/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/24/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230306-12

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C3-PFHxS	**Received:**	3/6/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	M3PFHxS	**Expires:**	8/11/2027
Type:	Solution	**Consumed:**	
Lot No:	M3PFHxS0822	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea Ampoule **% Moisture:**		
Description:	Sodium perfluoro-1-(1,2,3-13C3)hexanesulfonate		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C3-PFHxS	BDO-2227	47.4000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	13C3-PFHxS	Acid Concentration

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

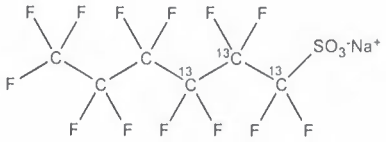
230306-12

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M3PFHxS
LOT NUMBER: M3PFHxS0822
COMPOUND: Sodium perfluoro-1-(1,2,3-$^{13}C_3$)hexanesulfonate

STRUCTURE:
CAS #: 2708218-86-2



MOLECULAR FORMULA:	$^{13}C_3{}^{12}C_3F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	425.07
CONCENTRATION:	50.0 ± 2.5 µg/mL (Na salt)	**SOLVENT(S):**	Methanol
	47.4 ± 2.4 µg/mL (M3PFHxS acid)		
	47.3 ± 2.4 µg/mL (M3PFHxS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3\text{-}^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	08/11/2022		
EXPIRY DATE: (mm/dd/yyyy)	08/11/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/26/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

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BATTELLE
It can be done

BDO Id: 230306-13

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C8-PFOS	**Received:**	3/6/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	M8PFOS	**Expires:**	5/19/2027
Type:	Solution	**Consumed:**	
Lot No:	M8PFOS0522	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea Ampoule **% Moisture:**		
Description:	Sodium perfluoro-1-(13C8)octanesulfonate		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C8-PFOS	BDO-2228	47.9000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	13C8-PFOS	Acid Concentration

Approved by: _____ **Approved on:** _____

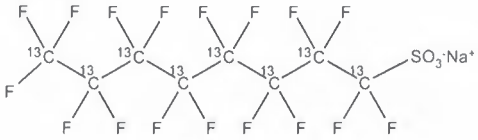
Authorized by: _____ **Authorized on:** _____

230306-13

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M8PFOS	**LOT NUMBER:**	M8PFOS0522
COMPOUND:	Sodium perfluoro-1-($^{13}C_8$)octanesulfonate		
STRUCTURE:		**CAS #:**	2522762-16-7



MOLECULAR FORMULA:	$^{13}C_8F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	530.05
CONCENTRATION:	50.0 ± 2.5 µg/mL (Na salt) 47.9 ± 2.4 µg/mL (M8PFOS acid) 47.8 ± 2.4 µg/mL (M8PFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	05/19/2022		
EXPIRY DATE: (mm/dd/yyyy)	05/19/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.2% of sodium perfluoro-1-($^{13}C_7$)heptanesulfonate ($^{13}C_7$-PFHpS) and ~1.1% of sodium perfluoro-1-(1,2,3,4-$^{13}C_4$)octanesulfonate (MPFOS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/25/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230306-14

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C2-PFDoA	**Received:**	3/6/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	MPFDoA	**Expires:**	12/21/2027
Type:	Solution	**Consumed:**	
Lot No:	MPFDoA1222	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea Ampoule **% Moisture:**		
Description:	Perfluoro-n-(1,2-13C2)dodecanoic acid		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C2-PFDoA	BDO-2112	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

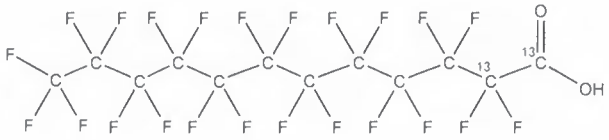
Authorized by: _____ **Authorized on:** _____

230306-14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDoA	**LOT NUMBER:**	MPFDoA1222
COMPOUND:	Perfluoro-n-(1,2-$^{13}C_2$)dodecanoic acid		
STRUCTURE:		**CAS #:**	960315-52-0



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{10}HF_{23}O_2$	**MOLECULAR WEIGHT:**	616.08
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	12/21/2022		
EXPIRY DATE: (mm/dd/yyyy)	12/21/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 01/13/2023 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230306-15

Reagent Receipt Report

Approved: ☐ Authorized ☐

Name:	13C2-PFTeDA	**Received:**	3/6/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	M2PFTeDA	**Expires:**	11/16/2027
Type:	Solution	**Consumed:**	
Lot No:	M2PFTeDA1122	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea Ampoule **% Moisture:**		
Description:	Perfluoro--n-(1,2-13C2)tetradecanoic acid		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C2-PFTeDA	BDO-2224	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

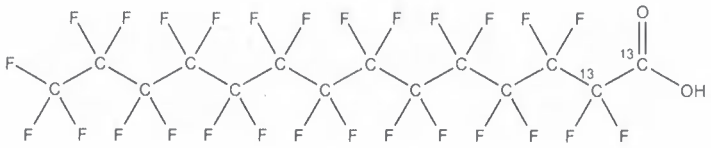
Authorized by: _____ **Authorized on:** _____

230306-15

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFTeDA	**LOT NUMBER:**	M2PFTeDA1122
COMPOUND:	Perfluoro-n-(1,2-$^{13}C_2$)tetradecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{12}HF_{27}O_2$	**MOLECULAR WEIGHT:**	716.10
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2$-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/16/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/16/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/25/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230306-16

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name: 13C6-PFDA
Vendor: Wellington Laboratories
Catalogue No: M6PFDA
Type: Solution
Lot No: M6PFDA0922
Quantity: 1 ea Ampoule **% Moisture:**
Description: Perfluoro-n-(1,2,3,4,5,6-13C6)decanoic acid

Received: 3/6/2023
Custodian: Fuhry, Paul
Expires: 9/15/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C6-PFDA	BDO-2222	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

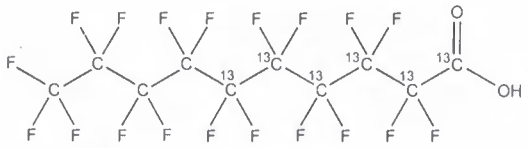
Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230306-16

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M6PFDA	**LOT NUMBER:**	M6PFDA0922
COMPOUND:	Perfluoro-n-(1,2,3,4,5,6-$^{13}C_6$)decanoic acid		
STRUCTURE:		**CAS #:**	2328024-56-0



MOLECULAR FORMULA:	$^{13}C_6{}^{12}C_4HF_{19}O_2$	**MOLECULAR WEIGHT:**	520.04
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4,5,6-$^{13}C_6$)
LAST TESTED: (mm/dd/yyyy)	09/15/2022		
EXPIRY DATE: (mm/dd/yyyy)	09/15/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/01/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230306-17

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C7-PFUdA	**Received:**	3/6/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	M7PFUdA	**Expires:**	6/8/2027
Type:	Solution	**Consumed:**	
Lot No:	M7PFUdA0522	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea Ampoule **% Moisture:**		
Description:	Perfluoro-n-(1,2,3,4,5,6,7-13C7)undecanoic acid		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C7-PFUnA	BDO-2223	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

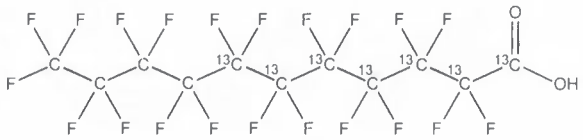
Authorized by: _____ **Authorized on:** _____

230306-17

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M7PFUdA	**LOT NUMBER:**	M7PFUdA0522
COMPOUND:	Perfluoro-n-(1,2,3,4,5,6,7-$^{13}C_7$)undecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_7{}^{12}C_4HF_{21}O_2$	**MOLECULAR WEIGHT:**	571.04
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C
LAST TESTED: (mm/dd/yyyy)	06/08/2022		(1,2,3,4,5,6,7-$^{13}C_7$)
EXPIRY DATE: (mm/dd/yyyy)	06/08/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/30/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230306-18

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name: 13C5-PFHxA
Vendor: Wellington Laboratories
Catalogue No: M5PFHxA
Type: Solution
Lot No: M5PFHxA1122
Quantity: 1 ea Ampoule **% Moisture:**
Description: Perfluoro-n-(1,2,3,4,5-13C5)hexanoic acid

Received: 3/6/2023
Custodian: Fuhry, Paul
Expires: 11/24/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C5-PFHxA	BDO-2217	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230306-18

WELLINGTON LABORATORIES

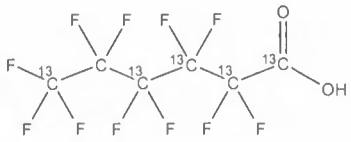
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M5PFHxA
COMPOUND: Perfluoro-n-(1,2,3,4,6-$^{13}C_5$)hexanoic acid

LOT NUMBER: M5PFHxA1122

STRUCTURE:

CAS #: 2328024-54-8



MOLECULAR FORMULA: $^{13}C_5{}^{12}C_1HF_{11}O_2$
CONCENTRATION: 50.0 ± 2.5 µg/mL

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/24/2022
EXPIRY DATE: (mm/dd/yyyy) 11/24/2027
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 319.02
SOLVENT(S): Methanol
Water (<1%)

ISOTOPIC PURITY: ≥99% ^{13}C ($1,2,3,4,6$-$^{13}C_5$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/13/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230306-19

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C4-PFHpA	**Received:**	3/6/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	M4PFHpA	**Expires:**	12/12/2027
Type:	Solution	**Consumed:**	
Lot No:	M4PFHpA1222	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea Ampoule **% Moisture:**		
Description:	Perfluoro-n-(1,2,3,4-13C4)heptanoic acid		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C4-PFHpA	BDO-2218	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

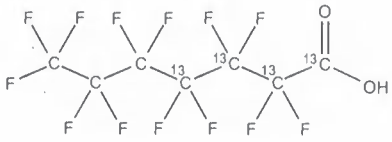
Authorized by: _____ **Authorized on:** _____

230306-19

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M4PFHpA	**LOT NUMBER:**	M4PFHpA1222
COMPOUND:	Perfluoro-n-(1,2,3,4-$^{13}C_4$)heptanoic acid		
STRUCTURE:		**CAS #:**	2328024-55-9



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_3HF_{13}O_2$	**MOLECULAR WEIGHT:**	368.03
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	12/12/2022		
EXPIRY DATE: (mm/dd/yyyy)	12/12/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~0.03% of perfluoro-n-heptanoic acid (PFHpA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/13/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230306-20

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C9-PFNA	**Received:**	3/6/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	M9PFNA	**Expires:**	11/24/2027
Type:	Solution	**Consumed:**	
Lot No:	M9PFNA1122	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea Ampoule **% Moisture:**		
Description:	Perfluoro-n-(13C9)nonanoic acid		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C9-PFNA	BDO-2221	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

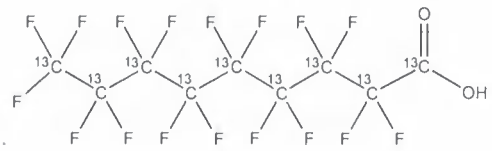
Authorized by: _____ **Authorized on:** _____

230306-20

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M9PFNA	**LOT NUMBER:**	M9PFNA1122
COMPOUND:	Perfluoro-n-($^{13}C_9$)nonanoic acid		
STRUCTURE:		**CAS #:**	2283397-80-6



MOLECULAR FORMULA:	$^{13}C_9HF_{17}O_2$	**MOLECULAR WEIGHT:**	473.01
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_9$)
LAST TESTED: (mm/dd/yyyy)	11/24/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/24/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~1.0% of perfluoro-n-($^{13}C_5$)nonanoic acid (MPFNA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/09/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230306-24

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C8-PFOA	**Received:**	3/6/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	M8PFOA	**Expires:**	5/30/2027
Type:	Solution	**Consumed:**	
Lot No:	M8PFOA0522	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea Ampoule **% Moisture:**		
Description:	Perfluoro-n-(13C8)octanoic acid		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C8-PFOA	BDO-2219	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

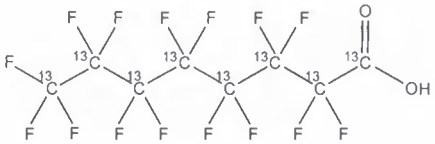
Authorized by: _____ **Authorized on:** _____

230306-24

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M8PFOA	**LOT NUMBER:**	M8PFOA0522
COMPOUND:	Perfluoro-n-($^{13}C_8$)octanoic acid		
STRUCTURE:		**CAS #:**	1350614-84-4



MOLECULAR FORMULA:	$^{13}C_8HF_{15}O_2$	**MOLECULAR WEIGHT:**	422.01
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	05/30/2022		
EXPIRY DATE: (mm/dd/yyyy)	05/30/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~1.0% of perfluoro-n-($^{13}C_4$)octanoic acid (MPFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/02/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230608-01

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	L-PFDoS	**Received:**	6/8/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	LPFDoS0423	**Expires:**	4/19/2028
Type:	Solution	**Consumed:**	
Lot No:	LPFDoS0423	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	2 ea ampoules **% Moisture:**		
Description:	L-PFDoS		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:	
Perfluoro-1-dodecanesulfonate	79780-39-5	48.5000	98.00	--	--	☐		0	0	1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	Perfluoro-1-dodecanesulfonate	as acid

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

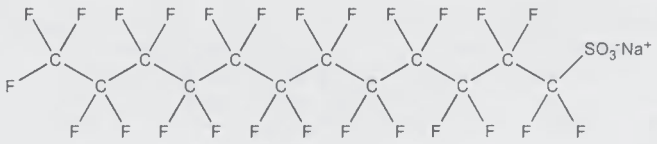
230608-01

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFDoS
LOT NUMBER: LPFDoS0423
COMPOUND: Sodium perfluoro-1-dodecanesulfonate

STRUCTURE:
CAS #: 1260224-54-1



MOLECULAR FORMULA:	$C_{12}F_{25}SO_3Na$	**MOLECULAR WEIGHT:**	722.14
CONCENTRATION:	50.0 ± 2.5 µg/mL (Na salt) 48.5 ± 2.4 µg/mL (PFDoS acid) 48.4 ± 2.4 µg/mL (PFDoS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	04/19/2023		
EXPIRY DATE: (mm/dd/yyyy)	04/19/2028		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.5% perfluoro-n-dodecanoic acid (PFDoA) and ~0.6% sodium perfluoro-1-undecanesulfonate (L-PFUdS)

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/21/2023 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230608-02

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	PFEESA	**Received:**	6/8/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	PFEESA1022	**Expires:**	1/20/2028
Type:	Solution	**Consumed:**	
Lot No:	PFEESA1022	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule	**% Moisture:**	
Description:	PFEESA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
Perfluoro (2-ethoxyethane) sulfonic a	113507-82-7	44.6000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	Perfluoro (2-ethoxyethane) sulfonic acid	as acid

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230608-02

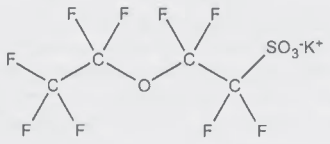
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFEESA **LOT NUMBER:** PFEESA1022

COMPOUND: Potassium perfluoro(2-ethoxyethane)sulfonate

STRUCTURE: **CAS #:** 117205-07-9



MOLECULAR FORMULA:	$C_4F_9SO_4K$	**MOLECULAR WEIGHT:**	354.19
CONCENTRATION:	50.0 ± 2.5 µg/mL (K salt)	**SOLVENT(S):**	Methanol
	44.6 ± 2.2 µg/mL (PFEESA acid)		
	44.5 ± 2.2 µg/mL (PFEESA anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	01/20/2023		
EXPIRY DATE: (mm/dd/yyyy)	01/20/2028		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.2% of perfluoro-n-octanoic acid (PFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 01/31/2023 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230608-03

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name: 10:2FTS
Vendor: Wellington Laboratories
Catalogue No: 102FTS1122
Type: Solution
Lot No: 102FTS1122
Quantity: 1 ea ampoule **% Moisture:**
Description: 10:2FTS

Received: 6/8/2023
Custodian: Kinsman, Nathaniel
Expires: 12/1/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
1H,1H,2H,2H-perfluorododecane sulf	120226-60-0	48.3000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	1H,1H,2H,2H-perfluorododecane sulfonate	as acid

Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

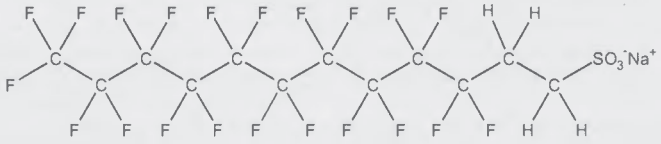
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 10:2FTS **LOT NUMBER:** 102FTS1122

COMPOUND: Sodium 1H,1H,2H,2H-perfluorododecanesulfonate

STRUCTURE: **CAS #:** 108026-35-3



MOLECULAR FORMULA: $C_{12}H_4F_{21}SO_3Na$ **MOLECULAR WEIGHT:** 650.18

CONCENTRATION: 50.0 ± 2.5 µg/mL (Na salt) **SOLVENT(S):** Methanol

48.3 ± 2.4 µg/mL (10:2FTS acid)

48.2 ± 2.4 µg/mL (10:2FTS anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 12/01/2022

EXPIRY DATE: (mm/dd/yyyy) 12/01/2027

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/09/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

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519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230608-04

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	N-MeFOSA-M	**Received:**	6/8/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	NMeFOSA1122M	**Expires:**	11/11/2027
Type:	Solution	**Consumed:**	
Lot No:	NMeFOSA1122M	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	2 ea ampoules **% Moisture:**		
Description:	N-MeFOSA-M		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
N-methylperfluoro-1-octanesulfonami	31506-32-8	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230608-04

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-MeFOSA-M
COMPOUND: N-Methylperfluoro-1-octanesulfonamide

LOT NUMBER: NMeFOSA1122M

STRUCTURE:

CAS #: 31506-32-8

MOLECULAR FORMULA:	$C_9H_4F_{17}NO_2S$	**MOLECULAR WEIGHT:**	513.17
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	11/11/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/11/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/25/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

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BATTELLE
It can be done

BDO Id: 230608-05

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	N-EtFOSA-M	**Received:**	6/8/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	NEtFOSA0123M	**Expires:**	1/18/2028
Type:	Solution	**Consumed:**	
Lot No:	NEtFOSA0123M	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	N-EtFOSA-M		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
N-ethylperfluoro-1-octanesulfonamid	4151-50-2	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230608-05

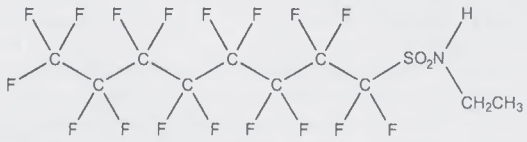
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-EtFOSA-M
COMPOUND: N-Ethylperfluoro-1-octanesulfonamide
LOT NUMBER: NEtFOSA0123M

STRUCTURE:

CAS #: 4151-50-2



MOLECULAR FORMULA:	$C_{10}H_6F_{17}NO_2S$	**MOLECULAR WEIGHT:**	527.20
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	01/18/2023		
EXPIRY DATE: (mm/dd/yyyy)	01/18/2028		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 01/24/2023
(mm/dd/yyyy)
B.G. Chittim, General Manager

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BATTELLE
It can be done

BDO Id: 230608-06

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	N-MeFOSE-M	**Received:**	6/8/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	NMeFOSE1122M	**Expires:**	12/22/2027
Type:	Solution	**Consumed:**	
Lot No:	NMeFOSE1122M	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	N-MeFOSE-M		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
2-(N-methylperfluoro-1-octanesulfon	24448-09-7	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230608-06

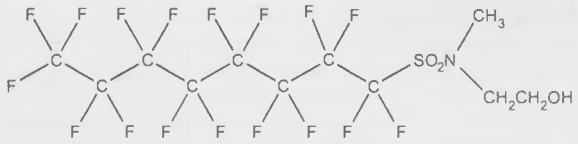
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSE-M **LOT NUMBER:** NMeFOSE1122M

COMPOUND: 2-(N-Methylperfluoro-1-octanesulfonamido)ethanol

STRUCTURE: **CAS #:** 24448-09-7



MOLECULAR FORMULA:	$C_{11}H_8F_{17}NO_3S$	**MOLECULAR WEIGHT:**	557.22
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/22/2022 (HRGC/LRMS) 11/25/2022 (LC/MS)		
EXPIRY DATE: (mm/dd/yyyy)	12/22/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS Data (Full Scan and Mass Spectrum)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- In order to see the molecular ion (adduct free), the LC mobile phase should be free of ammonium acetate buffer.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 01/17/2023 (mm/dd/yyyy)

B.G. Chittim, General Manager

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BATTELLE
It can be done

BDO Id: 230608-07

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	N-EtFOSE-M	**Received:**	6/8/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	NEtFOSE1222M	**Expires:**	12/22/2027
Type:	Solution	**Consumed:**	
Lot No:	NEtFOSE1222M	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	N-EtFOSE-M		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
2-(N-ethylperfluoro-1-octanesulfona	1691-99-2	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230608-07

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSE-M **LOT NUMBER:** NEtFOSE1222M

COMPOUND: 2-(N-Ethylperfluoro-1-octanesulfonamido)ethanol

STRUCTURE: **CAS #:** 1691-99-2

MOLECULAR FORMULA:	$C_{12}H_{10}F_{17}NO_3S$	**MOLECULAR WEIGHT:**	571.25
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/22/2022 (HRGC/LRMS) 11/25/2022 (LC/MS)		
EXPIRY DATE: (mm/dd/yyyy)	12/22/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS Data (Full Scan and Mass Spectrum)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- In order to see the molecular ion (adduct free), the LC mobile phase should be free of ammonium acetate buffer.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/29/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

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BATTELLE
It can be done

BDO Id: 230608-08

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	PF4OPeA	**Received:**	6/8/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	PF4OPeA0722	**Expires:**	8/2/2027
Type:	Solution	**Consumed:**	
Lot No:	PF4OPeA0722	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	PF4OPeA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
Perfluoro-3-methoxypropanoic acid	377-73-1	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

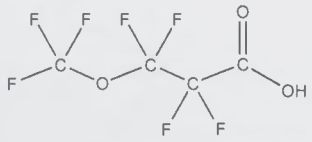
Authorized by: _____ **Authorized on:** _____

230608-08

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PF4OPeA	**LOT NUMBER:**	PF4OPeA0722
COMPOUND:	Perfluoro-4-oxapentanoic acid		
SYNONYM:	Perfluoro-3-methoxypropanoic acid (PFMPA)		
STRUCTURE:		**CAS #:**	377-73-1



MOLECULAR FORMULA:	$C_4HF_7O_3$	**MOLECULAR WEIGHT:**	230.04
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	08/02/2022		
EXPIRY DATE: (mm/dd/yyyy)	08/02/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/15/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230608-09

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	3,6-OPFHpA	**Received:**	6/8/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	36OPFHpA0323	**Expires:**	3/29/2028
Type:	Solution	**Consumed:**	
Lot No:	36OPFHpA0323	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	3,6-OPFHpA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
nonafluoro-3,6-dioxaheptanoic acid	151772-58-6	50.0000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	nonafluoro-3,6-dioxaheptanoic acid	as acid

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230608-09

WELLINGTON LABORATORIES

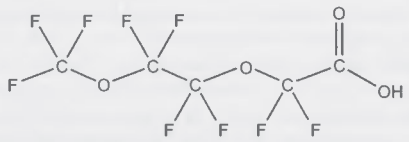
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 3,6-OPFHpA
COMPOUND: Perfluoro-3,6-dioxaheptanoic acid

LOT NUMBER: 36OPFHpA0323

STRUCTURE:

CAS #: 151772-58-6



MOLECULAR FORMULA: $C_5HF_9O_4$
CONCENTRATION: 50.0 ± 2.5 µg/mL

MOLECULAR WEIGHT: 296.04
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 03/29/2023
EXPIRY DATE: (mm/dd/yyyy) 03/29/2028
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/11/2023
(mm/dd/yyyy)
B.G. Chittim, General Manager

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BATTELLE
It can be done

BDO Id: 230608-10

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	PF5OHxA	**Received:**	6/8/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	PF5OHxA0722	**Expires:**	8/2/2027
Type:	Solution	**Consumed:**	
Lot No:	PF5OHxA0722	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	PF5OHxA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
Perfluoro-4-methoxybutanoic acid	863090-89-5	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

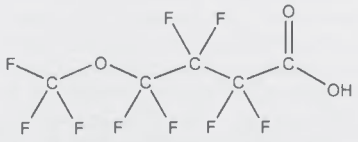
Authorized by: _____ **Authorized on:** _____

230608-10

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PF5OHxA	**LOT NUMBER:**	PF5OHxA0722
COMPOUND:	Perfluoro-5-oxahexanoic acid		
SYNONYM:	Perfluoro-4-methoxybutanoic acid (PFMBA)		
STRUCTURE:		**CAS #:**	863090-89-5



MOLECULAR FORMULA:	$C_5HF_9O_3$	**MOLECULAR WEIGHT:**	280.05
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	08/02/2022		
EXPIRY DATE: (mm/dd/yyyy)	08/02/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/26/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230608-11

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	PFHxDA	**Received:**	6/8/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	PFHxDA1222	**Expires:**	12/6/2027
Type:	Solution	**Consumed:**	
Lot No:	PFHxDA1222	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	PFHxDA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
Perfluoro-n-hexadecanoic acid	67905-19-5	50.0000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	Perfluoro-n-hexadecanoic acid	as acid

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230608-11

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxDA
LOT NUMBER: PFHxDA1222
COMPOUND: Perfluoro-n-hexadecanoic acid

STRUCTURE:
CAS #: 67905-19-5

MOLECULAR FORMULA: $C_{16}HF_{31}O_2$
MOLECULAR WEIGHT: 814.13
CONCENTRATION: 50.0 ± 2.5 µg/mL
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/06/2022
EXPIRY DATE: (mm/dd/yyyy) 12/06/2027
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/09/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230608-12

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	PFODA	**Received:**	6/8/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	PFODA0523	**Expires:**	5/30/2028
Type:	Solution	**Consumed:**	
Lot No:	PFODA0523	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	PFODA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
Perfluoro-n-octadecanoic acid	16517-11-6	50.0000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	Perfluoro-n-octadecanoic acid	as acid

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

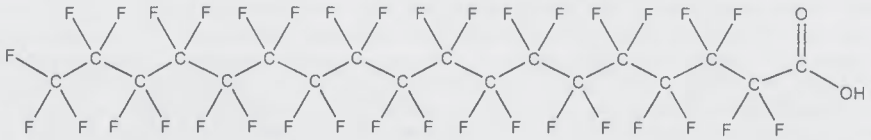
230608-12

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFODA
COMPOUND: Perfluoro-n-octadecanoic acid
LOT NUMBER: PFODA0523

STRUCTURE:
CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
MOLECULAR WEIGHT: 914.14
CONCENTRATION: 50.0 ± 2.5 µg/mL
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/30/2023
EXPIRY DATE: (mm/dd/yyyy) 05/30/2028
RECOMMENDED STORAGE: Store ampoule at ambient temperature in a dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- The solubility of this product in methanol is very sensitive to storage conditions and solvent composition. The stated validity period applies to the sealed ampoules stored at ambient temperature.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/02/2023 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230714-01

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C3-PFBA	**Received:**	7/14/2023
Vendor:	Wellington Laboratories	**Custodian:**	Harnden, Kelsey
Catalogue No:	M3PFBA	**Expires:**	6/15/2028
Type:	Solution	**Consumed:**	
Lot No:	M3PFBA0623	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	M3PFBA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C3-PFBA	BDO-2231	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230714-01

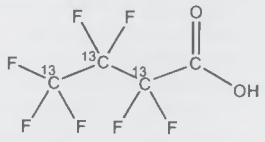
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M3PFBA
COMPOUND: Perfluoro-n-(2,3,4-$^{13}C_3$)butanoic acid

LOT NUMBER: M3PFBA0623

STRUCTURE:



CAS #: Not available

MOLECULAR FORMULA: $^{13}C_3{}^{12}CHF_7O_2$
CONCENTRATION: 50.0 ± 2.5 µg/mL

MOLECULAR WEIGHT: 217.02
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 06/15/2023
EXPIRY DATE: (mm/dd/yyyy) 06/15/2028
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C (2,3,4-$^{13}C_3$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~0.2% of perfluoro-n-($^{13}C_3$)propanoic acid, and also contains ~1.0% of perfluoro-n-($^{13}C_4$)butanoic acid due to the naturally occurring isotopic abundance of ^{13}C in the unlabelled carbon atom.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/27/2023 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230714-02

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	13C2-PFOA	**Received:**	7/14/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	M2PFOA0523	**Expires:**	5/15/2028
Type:	Solution	**Consumed:**	
Lot No:	M2PFOA0523	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	M2PFOA0523		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C2-PFOA	BDO-2107	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230714-02

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	M2PFOA	**LOT NUMBER:**	M2PFOA0523
COMPOUND:	Perfluoro-n-(1,2-$^{13}C_2$)octanoic acid		
STRUCTURE:		**CAS #:**	864071-08-9

MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6HF_{15}O_2$	**MOLECULAR WEIGHT:**	416.05
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	05/15/2023		
EXPIRY DATE: (mm/dd/yyyy)	05/15/2028		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/25/2023 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

ACCREDITATIONS

Accrediting Authority	Laboratory ID
U.S. Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP)	91667
State of Florida Department of Health	E87856
State of New York Department of Health	12105
State of Washington Department of Ecology	C1050
State of Maine	MA00056
State of Vermont	VT 87856
State of New Hampshire	2137
Commonwealth of Pennsylvania Department of Environmental Protection	68-05687
State of Alaska Department of Environmental Conservation	19-005
State of Rhode Island	E87856
State of California	3045

Current certificates and lists of accredited parameters are available upon request.

Sample Preparation

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
SAMPLE PREPARATION RECORDS

Project Title(s)	Project No.(s)
CTO-4117: Northwest PFAS Investigation	G25161.X1.XX.0026.00001

23-1034

CTO-4117: NBK Keyport PFAS in water (IDW)

W

SOP Numbers (see workplan for modifications)

ExtractionSOP No. 5-370

This Batch Contains The Following Samples:
DO701PB-FS
DO702LCS-FS
D7902-FS
D7903-FS

Laboratory Preparation Records
COMPLETE AND VALIDATED

Prep Task Leader: Hayley Beal

Approved By:	Date	Initials
Vincent Urso	08/23/2023	VU

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
SAMPLE IDENTIFICATION PAGE

Project Title(s)
CTO-4117: Northwest PFAS Investigation

Project No.(s)
G25161.X1.XX.0026.00001

23-1034

CTO-4117: NBK Keyport PFAS in water (IDW)

W

Sample ID	Description
DO701PB-FS	Procedural Blank
DO702LCS-FS	Laboratory Control Sample
D7902-FS	NBKK-B76-IDW01-AQ-081623
D7903-FS	NBKK-B76-IDW02-AQ-081623

Samples Assigned By: Matt Schumitz

Date : August 17, 2023
Due Date : August 24, 2023

Comments:

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BATTELLE - NORWELL OPERATIONS
SAMPLE CUSTODY LOG

Project Title(s)
CTO-4117: Northwest PFAS Investigation

Project No.(s)
G25161.X1.XX.0026.00001

23-1034

CTO-4117: NBK Keyport PFAS in water (IDW)

W

Requested On/By:	08/18/2023 HB	**Purpose:**	Sample Preparation
Relinquished On/By:	08/18/2023 CB	**Last Activity:**	Transfer

Accepted On/By:	08/18/2023 JS	**Returned On/To:**	
Stored In Facility:	Sample Preparation	**Returned To Facility:**	
Stored Until			
Stored Comment:	NA	**Returned Comment:**	NA

No.	BDO-ID:	Ctrs	*	Condition:	Custody Comment:
1	D7902	1	C	Consumed	NA
2	D7903	1	C	Consumed	NA
Total Samples		2	* "C" = Consumed Container		

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
SAMPLE VOLUME FORM

Project Title(s)
CTO-4117: Northwest PFAS Investigation

Project No.(s)
G25161.X1.XX.0026.00001

23-1034

CTO-4117: NBK Keyport PFAS in water (IDW)

Sample ID	Bottles	*	Calc. By Wt.	pH Check	Initial Wt. (g)	Empty Wt. (g)	Volume (mL)	Vol. Recorded Date/Initials
DO701PB-FS	NA	--	Yes	Valid	288.65	30.41	258.0	NA
DO702LCS-FS	NA	--	Yes	Valid	284.26	30.46	254.0	NA
D7902-FS	1	C	Yes	Adjusted	314.36	33.09	281.0	NA
D7903-FS	1	C	Yes	Valid	315.8	35.11	281.0	NA

Balance Information:

Initial Wt. Balance:	Initial Wt Date/Initials:	Empty Wt. Balance:	Empty Wt Date/Initials:
BAL-007	08/18/23 JS	BAL-007	08/18/23 PF

Calc. by Wt. - if yes, volume is calculated as the total weight of the bottle - empty weight, assuming a Density of 1, value rounded to nearest whole number. If yes, Vol. Recorded Date/Initials will be "NA"

* - "C" = Sample is Consumed

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
SURROGATE SPIKE FORM

Project Title(s)
CTO-4117: Northwest PFAS Investigation

Project No.(s)
G25161.X1.X
X.0026.00000
1

23-1034

CTO-4117: NBK Keyport PFAS in water (IDW)

W

Sample ID	Standard ID	Type	Vial No.	Vol Added (uL)	Date Spiked/ Spiked By	Witn'd By	Comment
DO701PB-FS	LX92	SIS	4	50	08/18/23 JS	HB	NA
DO702LCS-FS	LX91	LCS/MS	1	100	08/18/23 JS	HB	NA
DO702LCS-FS	LX92	SIS	4	50	08/18/23 JS	HB	NA
D7902-FS	LX92	SIS	4	50	08/18/23 JS	HB	NA
D7903-FS	LX92	SIS	4	50	08/18/23 JS	HB	NA

Syringes/Pipettes Used:

Std ID	Type	Syr/Pip
LX91	Pipette	B814659662
LX92	Pipette	B814659662

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
SAMPLE EXTRACTION FORM

Project Title(s)
CTO-4117: Northwest PFAS Investigation

Project No.(s)
G25161.X1.XX.0026.000001

23-1034

CTO-4117: NBK Keyport PFAS in water (IDW)

W

Sample ID	1st Extraction	2nd Extraction	3rd Extraction	Comment
DO701PB-FS	08/18/23 JS	NA	NA	NA
DO702LCS-FS	08/18/23 JS	NA	NA	NA
D7902-FS	08/18/23 JS	NA	NA	NA
D7903-FS	08/18/23 JS	NA	NA	NA

Solvents/Reagent Preparations:

Name	ID	Expires	Lot No	Procedure	Comments
Pre-packed SPE Carbon Column	RP-230818-17	08/18/23	X1123-TB/1256		
Pre-packed SPE Carbon Column	RP-230818-17	08/18/23	165671		
1% NH3OH in Methanol	RP-230818-18	08/18/23	224253	3.3 mL NH3OH and 97 mL MeOH for each 100 mL prepared	
1% NH3OH in Methanol	RP-230818-18	08/18/23	A0443371	3.3 mL NH3OH and 97 mL MeOH for each 100 mL prepared	

Solvents/Reagents:

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
INTERNAL STANDARD SPIKING FORM

Project Title(s)
CTO-4117: Northwest PFAS Investigation

Project No.(s)
G25161.X1.X
X.0026.00000
1

23-1034

CTO-4117: NBK Keyport PFAS in water (IDW)

W

(N/A Fraction)

Extract Id	Extr. Vol. (uL)	Added (uL)	Std. Id	Accm. (uL)	Vial No.	Pre Inj. Vol. (uL)^	Final Dilution *	Date Spiked/ Spiked By	Witn'd By
DO701PB-FS(0)	4950	50	LZ07	50	3	5000	1.000	08/21/23 OF	TN
DO702LCS-FS(0)	4950	50	LZ07	50	3	5000	1.000	08/21/23 OF	TN
D7902-FS(0)	4950	50	LZ07	50	3	5000	1.000	08/21/23 OF	TN
D7903-FS(0)	4950	50	LZ07	50	3	5000	1.000	08/21/23 OF	TN

Syringes/Pipettes Used:

Std ID	Type	Syr/Pip
LZ07	Pipette	B814659662

* - Final Dilution is any HPLC, dilutions, or other manipulation

^ - Pre Injection Volume (PIV) includes any RIS spikes.

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
PREPARATION EXTRACT SPLIT FORM

Project Title(s)
CTO-4117: Northwest PFAS Investigation

Project No.(s)
G25161.X1.X
X.0026.00000
1

23-1034

CTO-4117: NBK Keyport PFAS in water (IDW)

W

Extract		*	Extract Date	Source		Initial Extract Vol (uL)	Extract Split	Extract Split	Total Dilution	Date/Initials
Name	#			Name	#					
DO701PB-FS	0	--	8/18/2023 1:12:00 PM	NA		NA	NA	1.000	1.000	08/18/23 JS
DO702LCS-FS	0	--	8/18/2023 1:12:00 PM	NA		NA	NA	1.000	1.000	08/18/23 JS
D7902-FS	0	--	8/18/2023 1:12:00 PM	NA		NA	NA	1.000	1.000	08/18/23 JS
D7903-FS	0	--	8/18/2023 1:12:00 PM	NA		NA	NA	1.000	1.000	08/18/23 JS

Total Oil = [Sample Volume (uL) / Aliquot Volume (uL)] * [Aliquot Weight (mg)]
Dilution Factor = [Sample Volume (uL) / Aliqot Volume (uL))] * Prior Dilution Factor
* - "C" = Extract is Consumed

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
EXTRACT - INSTRUMENT FACILITY CUSTODY PAGE

Project Title(s)
CTO-4117: Northwest PFAS Investigation

Project No.(s)
G25161.X1.X
X.0026.00000
1

23-1034

CTO-4117: NBK Keyport PFAS in water (IDW)

W

Purpose:	LC-MS/MS TRANSFER	**Last Activity:**	Prep->Inst
Relinquished On/By:	Aug 21 2023 11:28AM NAK	**Received On/By:**	Aug 21 2023 11:28AM VU
Relinquished From:	Sample Preparation: NA	**Received Location:**	LC Laboratory #2: NA
Relinquish Comment:	NA	**Received Comment:**	NA

No.	BDO-ID:	PIV:	DF:	Condition:	Custody Comment:
1	DO701PB-FS(0)	5000	1	Intact	NA
2	DO702LCS-FS(0)	5000	1	Intact	NA
3	D7902-FS(0)	5000	1	Intact	NA
4	D7903-FS(0)	5000	1	Intact	NA

Total Extracts: 4

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
SAMPLE SPECIFIC COMMENTS

Project Title(s)
CTO-4117: Northwest PFAS Investigation

Project No.(s)
G25161.X1.XX.0026.00001

23-1034

CTO-4117: NBK Keyport PFAS in water (IDW)

W

Sample ID:	Comment:	Date/Initials:
DO701PB-FS	Extraction started at 1:12 PM, manifold 19, ended at 3:00 PM.	08/18/23 JS
DO702LCS-FS	Extraction started at 1:12 PM, manifold 19, ended at 2:41 PM.	08/18/23 JS
D7902-FS	pH was adjusted to be in between 6 and 8.	08/18/23 JS
D7902-FS	Extraction started at 1:12 PM, manifold 3, ended at 3:17 PM.	08/18/23 JS
D7902-FS	Sample contained particulates.	08/18/23 JS
D7903-FS	Extraction started at 1:12 PM, manifold 19, ended at 3:17 PM.	08/18/23 JS

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
MISCELLANEOUS DOCUMENTATION FORM

Project Title(s)	Project No.(s)
CTO-4117: Northwest PFAS Investigation	G25161.X1.XX.0026.000001

23-1034

CTO-4117: NBK Keyport PFAS in water (IDW)

W

Entered By:	On:

Task Leader Approval:	On:
SupervisorApproval:	On:
PM Approval:	On:

Analytical Calibrations

BATTELLE

Sequence Report

Created with Analyst Reporter
Printed: 23/08/2023 10:38:30 AM

Vial	Laboratory Sample ID	Client Sample ID	Acquisition Date	Acquisition Method	Data File	
3	LZ83	L1	8/21/2023 5:05:55 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
4	LZ84	L2	8/21/2023 5:21:58 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
5	LZ85	L3	8/21/2023 5:38:02 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
6	LZ86	L4	8/21/2023 5:54:06 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
7	LZ87	L5	8/21/2023 6:10:10 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
8	LZ88	L6	8/21/2023 6:26:12 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
9	LZ89	L7	8/21/2023 6:42:16 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
10	LZ90	L8	8/21/2023 6:58:19 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
11	LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
12	LZ92 ICC	ICC	8/21/2023 7:30:28 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
13	LY28 BRANCH		8/21/2023 7:46:32 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
~~14~~	~~DO579PB-FS(0)~~		~~8/21/2023 8:02:37 PM~~	~~5-369_ACN.dam~~	~~AD_08212023_5-369.wiff~~	1
~~15~~	~~DO512PB-FS(0)~~		~~8/21/2023 8:18:42 PM~~	~~5-369_ACN.dam~~	~~AD_08212023_5-369.wiff~~	
~~16~~	~~D7279-FS(0)~~		~~8/21/2023 8:34:48 PM~~	~~5-369_ACN.dam~~	~~AD_08212023_5-369.wiff~~	
~~17~~	~~D7280-FS(0)~~		~~8/21/2023 8:50:51 PM~~	~~5-369_ACN.dam~~	~~AD_08212023_5-369.wiff~~	
~~18~~	~~4%~~		~~8/21/2023 9:06:55 PM~~	~~5-369_ACN.dam~~	~~AD_08212023_5-369.wiff~~	
~~19~~	~~DO510PB-FS(0)~~		~~8/21/2023 9:22:59 PM~~	~~5-369_ACN.dam~~	~~AD_08212023_5-369.wiff~~	
~~20~~	~~DO511LCS-FS(0)~~		~~8/21/2023 9:39:03 PM~~	~~5-369_ACN.dam~~	~~AD_08212023_5-369.wiff~~	
~~21~~	~~D7446-FS(0)~~		~~8/21/2023 9:55:07 PM~~	~~5-369_ACN.dam~~	~~AD_08212023_5-369.wiff~~	
~~22~~	~~4%~~		~~8/21/2023 10:11:11 PM~~	~~5-369_ACN.dam~~	~~AD_08212023_5-369.wiff~~	
23	LZ86 CCV	CCV	8/21/2023 10:27:16 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
24	DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
25	DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
26	D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
27	D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
28	4%		8/21/2023 11:47:38 PM	5-369_ACN.dam	AD_08212023_5-369.wiff	
29	LZ87 CCV	CCV	8/22/2023 12:03:44 AM	5-369_ACN.dam	AD_08212023_5-369.wiff	

1 - Samples from another batch; not reported with this one. VU 23AUG2023

Analyte Name	PFHxA_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	313.0 / 269.0	**Result Table**	23-1034
Internal Standard	13C5-PFHxA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.26812 x + -0.01097 (r = 0.99896) (weighting: 1 / x) r^2:0.9979

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.158	126.1
4	LZ84	L2	True	0.250	0.257	102.7
5	LZ85	L3	True	0.500	0.486	97.3
6	LZ86	L4	True	1.000	0.941	94.1
7	LZ87	L5	True	2.500	2.119	84.8
8	LZ88	L6	True	10.000	9.458	94.6
9	LZ89	L7	True	25.000	24.280	97.1
10	LZ90	L8	True	50.000	51.677	103.4

Analyte Name	PFHxA_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	313.0 / 118.9	**Result Table**	23-1034
Internal Standard	13C5-PFHxA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.02913 x + -7.81668e-5 (r = 0.99959) (weighting: 1 / x) r^2:0.9992

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.155	124.2
4	LZ84	L2	True	0.250	0.250	100.0
5	LZ85	L3	True	0.500	0.488	97.7
6	LZ86	L4	True	1.000	0.914	91.4
7	LZ87	L5	True	2.500	2.201	88.1
8	LZ88	L6	True	10.000	9.804	98.0
9	LZ89	L7	True	25.000	24.757	99.0
10	LZ90	L8	True	50.000	50.805	101.6

Analyte Name	PFHpA_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	363.1 / 319.0	**Result Table**	23-1034
Internal Standard	13C4-PFHpA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.16746 x + -0.00691 (r = 0.99872) (weighting: 1 / x) r^2:0.9974

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.144	115.2
4	LZ84	L2	True	0.250	0.245	98.0
5	LZ85	L3	True	0.500	0.511	102.3
6	LZ86	L4	True	1.000	0.986	98.6
7	LZ87	L5	True	2.500	2.098	83.9
8	LZ88	L6	True	10.000	10.517	105.2
9	LZ89	L7	True	25.000	23.519	94.1
10	LZ90	L8	True	50.000	51.354	102.7

Analyte Name	PFHpA_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	363.1 / 169.0	**Result Table**	23-1034
Internal Standard	13C4-PFHpA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.01614 x + 2.14002e-5 (r = 0.99833) (weighting: 1 / x) r^2:0.9967

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.112	89.9
4	LZ84	L2	True	0.250	0.290	116.0
5	LZ85	L3	True	0.500	0.619	123.8
6	LZ86	L4	True	1.000	0.950	95.0
7	LZ87	L5	True	2.500	1.922	76.9
8	LZ88	L6	True	10.000	9.972	99.7
9	LZ89	L7	True	25.000	23.816	95.3
10	LZ90	L8	True	50.000	51.693	103.4

Analyte Name	PFOA_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	413.0 / 369.0	**Result Table**	23-1034
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.03844 x + -0.00361 (r = 0.99956) (weighting: 1 / x) r^2:0.9991

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.130	104.4
4	LZ84	L2	True	0.250	0.262	104.6
5	LZ85	L3	True	0.500	0.485	97.1
6	LZ86	L4	True	1.000	0.982	98.3
7	LZ87	L5	True	2.500	2.249	90.0
8	LZ88	L6	True	10.000	10.683	106.8
9	LZ89	L7	True	25.000	24.853	99.4
10	LZ90	L8	True	50.000	49.730	99.5

Analyte Name	PFOA_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	413.0 / 169.0	**Result Table**	23-1034
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.03906 x + -2.33559e-4 (r = 0.99958) (weighting: 1 / x) r^2:0.9992

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.121	97.0
4	LZ84	L2	True	0.250	0.318	127.2
5	LZ85	L3	True	0.500	0.423	84.7
6	LZ86	L4	True	1.000	0.948	94.8
7	LZ87	L5	True	2.500	2.348	93.9
8	LZ88	L6	True	10.000	10.383	103.8
9	LZ89	L7	True	25.000	24.445	97.8
10	LZ90	L8	True	50.000	50.389	100.8

Analyte Name	PFNA_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	463.0 / 419.0	**Result Table**	23-1034
Internal Standard	13C9-PFNA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.07583 x + -0.01799 (r = 0.99723) (weighting: 1 / x) r^2:0.9945

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	False	0.125	0.234	187.0
4	LZ84	L2	True	0.250	0.309	123.6
5	LZ85	L3	True	0.500	0.501	100.1
6	LZ86	L4	True	1.000	0.996	99.6
7	LZ87	L5	True	2.500	2.166	86.7
8	LZ88	L6	True	10.000	9.164	91.6
9	LZ89	L7	True	25.000	23.078	92.3
10	LZ90	L8	True	50.000	53.035	106.1

Analyte Name	PFNA_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	463.0 / 219.0	**Result Table**	23-1034
Internal Standard	13C9-PFNA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.17104 x + -0.00145 (r = 0.99751) (weighting: 1 / x) r^2:0.9950

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	False	0.125	0.137	109.7
4	LZ84	L2	True	0.250	0.285	114.1
5	LZ85	L3	True	0.500	0.524	104.7
6	LZ86	L4	True	1.000	0.947	94.7
7	LZ87	L5	True	2.500	2.315	92.6
8	LZ88	L6	True	10.000	9.784	97.8
9	LZ89	L7	True	25.000	22.599	90.4
10	LZ90	L8	True	50.000	52.796	105.6

Analyte Name	PFDA_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	512.9 / 469.0	**Result Table**	23-1034
Internal Standard	13C6-PFDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.55905 x + -0.00258 (r = 0.99865) (weighting: 1 / x) r^2:0.9973

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.130	103.9
4	LZ84	L2	True	0.250	0.240	95.9
5	LZ85	L3	True	0.500	0.593	118.7
6	LZ86	L4	True	1.000	0.958	95.8
7	LZ87	L5	True	2.500	2.355	94.2
8	LZ88	L6	True	10.000	9.213	92.1
9	LZ89	L7	True	25.000	23.824	95.3
10	LZ90	L8	True	50.000	52.062	104.1

Analyte Name	PFDA_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	512.9 / 219.0	**Result Table**	23-1034
Internal Standard	13C6-PFDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.01480 x + -2.10716e-5 (r = 0.99864) (weighting: 1 / x) r^2:0.9973

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.203	162.1
4	LZ84	L2	True	0.250	0.111	44.5
5	LZ85	L3	True	0.500	0.425	85.0
6	LZ86	L4	True	1.000	1.173	117.3
7	LZ87	L5	True	2.500	2.214	88.6
8	LZ88	L6	True	10.000	10.051	100.5
9	LZ89	L7	True	25.000	25.798	103.2
10	LZ90	L8	True	50.000	49.401	98.8

Analyte Name	PFUnA_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	563.1 / 519.0	**Result Table**	23-1034
Internal Standard	13C7-PFUnA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.92061 x + -0.00609 (r = 0.99884) (weighting: 1 / x) r^2:0.9977

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.150	120.4
4	LZ84	L2	True	0.250	0.273	109.1
5	LZ85	L3	True	0.500	0.485	97.1
6	LZ86	L4	True	1.000	0.933	93.3
7	LZ87	L5	True	2.500	2.139	85.6
8	LZ88	L6	True	10.000	9.471	94.7
9	LZ89	L7	True	25.000	24.049	96.2
10	LZ90	L8	True	50.000	51.875	103.8

Analyte Name	PFUnA_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	563.1 / 269.1	**Result Table**	23-1034
Internal Standard	13C7-PFUnA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.04418 x + -7.51906e-6 (r = 0.99900) (weighting: 1 / x) r^2:0.9980

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.155	123.7
4	LZ84	L2	True	0.250	0.249	99.5
5	LZ85	L3	True	0.500	0.503	100.6
6	LZ86	L4	True	1.000	0.921	92.1
7	LZ87	L5	True	2.500	2.173	86.9
8	LZ88	L6	True	10.000	9.855	98.6
9	LZ89	L7	True	25.000	23.824	95.3
10	LZ90	L8	True	50.000	51.695	103.4

Analyte Name	PFDoA_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	613.1 / 569.0	**Result Table**	23-1034
Internal Standard	13C2-PFDoA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.51510 x + -0.00245 (r = 0.99970) (weighting: 1 / x) r^2:0.9994

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.162	129.8
4	LZ84	L2	True	0.250	0.222	88.9
5	LZ85	L3	True	0.500	0.480	96.0
6	LZ86	L4	True	1.000	0.950	95.0
7	LZ87	L5	True	2.500	2.241	89.6
8	LZ88	L6	True	10.000	9.915	99.2
9	LZ89	L7	True	25.000	25.372	101.5
10	LZ90	L8	True	50.000	50.033	100.1

Analyte Name	PFDoA_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	613.1 / 319.0	**Result Table**	23-1034
Internal Standard	13C2-PFDoA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.09034 x + 2.10329e-5 (r = 0.99945) (weighting: 1 / x) r^2:0.9989

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.112	89.3
4	LZ84	L2	True	0.250	0.314	125.4
5	LZ85	L3	True	0.500	0.441	88.3
6	LZ86	L4	True	1.000	1.002	100.2
7	LZ87	L5	True	2.500	2.299	92.0
8	LZ88	L6	True	10.000	10.376	103.8
9	LZ89	L7	True	25.000	25.750	103.0
10	LZ90	L8	True	50.000	49.082	98.2

Analyte Name	PFTrDA_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	663.0 / 619.0	**Result Table**	23-1034
Internal Standard	13C2-PFTeDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.13957 x + -0.00103 (r = 0.99891) (weighting: 1 / x) r^2:0.9978

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.121	96.6
4	LZ84	L2	True	0.250	0.258	103.4
5	LZ85	L3	True	0.500	0.531	106.1
6	LZ86	L4	True	1.000	1.071	107.1
7	LZ87	L5	True	2.500	2.386	95.4
8	LZ88	L6	True	10.000	8.769	87.7
9	LZ89	L7	True	25.000	25.572	102.3
10	LZ90	L8	True	50.000	50.667	101.3

Analyte Name	PFTrDA_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	663.0 / 168.9	**Result Table**	23-1034
Internal Standard	13C2-PFTeDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.03017 x + -1.34352e-4 (r = 0.99926) (weighting: 1 / x) r^2:0.9985

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.063	50.6
4	LZ84	L2	True	0.250	0.310	123.9
5	LZ85	L3	True	0.500	0.567	113.3
6	LZ86	L4	True	1.000	1.110	111.0
7	LZ87	L5	True	2.500	2.524	101.0
8	LZ88	L6	True	10.000	9.839	98.4
9	LZ89	L7	True	25.000	25.971	103.9
10	LZ90	L8	True	50.000	48.992	98.0

Analyte Name	PFTeDA_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	713.0 / 669.0	**Result Table**	23-1034
Internal Standard	13C2-PFTeDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.86197 x + 0.00219 (r = 0.99979) (weighting: 1 / x) r^2:0.9996

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.124	99.2
4	LZ84	L2	True	0.250	0.256	102.2
5	LZ85	L3	True	0.500	0.500	100.0
6	LZ86	L4	True	1.000	1.080	108.0
7	LZ87	L5	True	2.500	2.308	92.3
8	LZ88	L6	True	10.000	9.680	96.8
9	LZ89	L7	True	25.000	25.280	101.1
10	LZ90	L8	True	50.000	50.147	100.3

Analyte Name	PFTeDA_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	713.0 / 168.9	**Result Table**	23-1034
Internal Standard	13C2-PFTeDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.01705 x + 1.97327e-4 (r = 0.99883) (weighting: 1 / x) r^2:0.9977

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.103	82.7
4	LZ84	L2	True	0.250	0.232	92.9
5	LZ85	L3	True	0.500	0.449	89.7
6	LZ86	L4	True	1.000	1.283	128.3
7	LZ87	L5	True	2.500	2.484	99.4
8	LZ88	L6	True	10.000	10.932	109.3
9	LZ89	L7	True	25.000	24.930	99.7
10	LZ90	L8	True	50.000	48.962	97.9

Analyte Name	PFBS_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	298.7 / 79.9	**Result Table**	23-1034
Internal Standard	13C3-PFBS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.19367 x + 0.00140 (r = 0.99965) (weighting: 1 / x) r^2:0.9993

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.098	78.1
4	LZ84	L2	True	0.250	0.272	108.9
5	LZ85	L3	True	0.500	0.558	111.6
6	LZ86	L4	True	1.000	1.028	102.8
7	LZ87	L5	True	2.500	2.500	100.0
8	LZ88	L6	True	10.000	9.652	96.5
9	LZ89	L7	True	25.000	25.812	103.3
10	LZ90	L8	True	50.000	49.455	98.9

Analyte Name	PFBS_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	298.9 / 98.8	**Result Table**	23-1034
Internal Standard	13C3-PFBS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.21478 x + 0.00148 (r = 0.99950) (weighting: 1 / x) r^2:0.9990

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.108	86.6
4	LZ84	L2	True	0.250	0.281	112.6
5	LZ85	L3	True	0.500	0.568	113.7
6	LZ86	L4	True	1.000	0.911	91.1
7	LZ87	L5	True	2.500	2.382	95.3
8	LZ88	L6	True	10.000	9.813	98.1
9	LZ89	L7	True	25.000	26.031	104.1
10	LZ90	L8	True	50.000	49.281	98.6

Analyte Name	PFHxS_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	399.0 / 80.0	**Result Table**	23-1034
Internal Standard	13C3-PFHxS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.10682 x + -0.00627 (r = 0.99869) (weighting: 1 / x) r^2:0.9974

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.155	123.8
4	LZ84	L2	True	0.250	0.239	95.6
5	LZ85	L3	True	0.500	0.519	103.7
6	LZ86	L4	True	1.000	0.958	95.9
7	LZ87	L5	True	2.500	2.233	89.3
8	LZ88	L6	True	10.000	9.097	91.0
9	LZ89	L7	True	25.000	24.198	96.8
10	LZ90	L8	True	50.000	51.977	104.0

Analyte Name	PFHxS_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	399.0 / 99.0	**Result Table**	23-1034
Internal Standard	13C3-PFHxS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.43519 x + -0.00209 (r = 0.99865) (weighting: 1 / x) r^2:0.9973

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.135	108.3
4	LZ84	L2	True	0.250	0.265	106.0
5	LZ85	L3	True	0.500	0.531	106.1
6	LZ86	L4	True	1.000	0.926	92.6
7	LZ87	L5	True	2.500	2.358	94.3
8	LZ88	L6	True	10.000	9.393	93.9
9	LZ89	L7	True	25.000	23.578	94.3
10	LZ90	L8	True	50.000	52.189	104.4

Analyte Name	PFOS_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	498.9 / 79.9	**Result Table**	23-1034
Internal Standard	13C8-PFOS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.64504 x + 0.00187 (r = 0.99908) (weighting: 1 / x) r^2:0.9982

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.112	89.8
4	LZ84	L2	True	0.250	0.300	119.8
5	LZ85	L3	True	0.500	0.463	92.6
6	LZ86	L4	True	1.000	1.003	100.3
7	LZ87	L5	True	2.500	2.486	99.4
8	LZ88	L6	True	10.000	9.387	93.9
9	LZ89	L7	True	25.000	26.505	106.0
10	LZ90	L8	True	50.000	49.120	98.2

Analyte Name	PFOS_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	498.9 / 98.9	**Result Table**	23-1034
Internal Standard	13C8-PFOS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.15306 x + -5.00014e-4 (r = 0.99880) (weighting: 1 / x) r^2:0.9976

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.121	96.9
4	LZ84	L2	True	0.250	0.212	84.7
5	LZ85	L3	True	0.500	0.552	110.5
6	LZ86	L4	True	1.000	1.060	106.0
7	LZ87	L5	True	2.500	2.560	102.4
8	LZ88	L6	True	10.000	9.530	95.3
9	LZ89	L7	True	25.000	26.773	107.1
10	LZ90	L8	True	50.000	48.566	97.1

Analyte Name	NMeFOSAA_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	570.1 / 419.0	**Result Table**	23-1034
Internal Standard	d3-MeFOSAA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.82959 x + 2.64688e-4 (r = 0.99939) (weighting: 1 / x) r^2:0.9988

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.104	83.3
4	LZ84	L2	True	0.250	0.285	114.0
5	LZ85	L3	True	0.500	0.438	87.6
6	LZ86	L4	True	1.000	1.121	112.1
7	LZ87	L5	True	2.500	2.430	97.2
8	LZ88	L6	True	10.000	10.794	107.9
9	LZ89	L7	True	25.000	24.727	98.9
10	LZ90	L8	True	50.000	49.475	99.0

Analyte Name	NMeFOSAA_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	570.1 / 483.0	**Result Table**	23-1034
Internal Standard	d3-MeFOSAA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.04475 x + 6.52035e-4 (r = 0.99635) (weighting: 1 / x) r^2:0.9927

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.207	165.5
4	LZ84	L2	True	0.250	0.171	68.6
5	LZ85	L3	True	0.500	0.282	56.4
6	LZ86	L4	True	1.000	1.259	125.9
7	LZ87	L5	True	2.500	1.991	79.6
8	LZ88	L6	True	10.000	10.883	108.8
9	LZ89	L7	True	25.000	23.024	92.1
10	LZ90	L8	True	50.000	51.558	103.1

Analyte Name	NEtFOSAA_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	584.2 / 419.1	**Result Table**	23-1034
Internal Standard	d5-EtFOSAA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.79117 x + 7.60243e-4 (r = 0.99980) (weighting: 1 / x) r^2:0.9996

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.123	98.7
4	LZ84	L2	True	0.250	0.246	98.3
5	LZ85	L3	True	0.500	0.488	97.7
6	LZ86	L4	True	1.000	1.006	100.6
7	LZ87	L5	True	2.500	2.692	107.7
8	LZ88	L6	True	10.000	9.797	98.0
9	LZ89	L7	True	25.000	24.508	98.0
10	LZ90	L8	True	50.000	50.514	101.0

Analyte Name	NEtFOSAA_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	584.2 / 526.0	**Result Table**	23-1034
Internal Standard	d5-EtFOSAA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.89861 x + 7.05443e-4 (r = 0.99967) (weighting: 1 / x) r^2:0.9993

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.129	103.4
4	LZ84	L2	True	0.250	0.244	97.8
5	LZ85	L3	True	0.500	0.469	93.8
6	LZ86	L4	True	1.000	1.004	100.4
7	LZ87	L5	True	2.500	2.482	99.3
8	LZ88	L6	True	10.000	10.691	106.9
9	LZ89	L7	True	25.000	24.894	99.6
10	LZ90	L8	True	50.000	49.462	98.9

Analyte Name	HFPO-DA_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	284.9 / 168.9	**Result Table**	23-1034
Internal Standard	13C3-HFPO-DA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.19437 x + -0.00436 (r = 0.99969) (weighting: 1 / x) r^2:0.9994

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.132	105.6
4	LZ84	L2	True	0.250	0.237	94.9
5	LZ85	L3	True	0.500	0.501	100.3
6	LZ86	L4	True	1.000	1.095	109.5
7	LZ87	L5	True	2.500	2.342	93.7
8	LZ88	L6	True	10.000	9.503	95.0
9	LZ89	L7	True	25.000	24.929	99.7
10	LZ90	L8	True	50.000	50.634	101.3

Analyte Name	HFPO-DA_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	284.9 / 184.9	**Result Table**	23-1034
Internal Standard	13C3-HFPO-DA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.16368 x + 0.00363 (r = 0.99975) (weighting: 1 / x) r^2:0.9995

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.110	87.7
4	LZ84	L2	True	0.250	0.278	111.2
5	LZ85	L3	True	0.500	0.458	91.6
6	LZ86	L4	True	1.000	1.111	111.1
7	LZ87	L5	True	2.500	2.540	101.6
8	LZ88	L6	True	10.000	9.565	95.7
9	LZ89	L7	True	25.000	25.215	100.9
10	LZ90	L8	True	50.000	50.097	100.2

Analyte Name	ADONA_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	376.9 / 250.9	**Result Table**	23-1034
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.90252 x + -0.01190 (r = 0.99966) (weighting: 1 / x) r^2:0.9993

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.145	115.6
4	LZ84	L2	True	0.250	0.237	95.0
5	LZ85	L3	True	0.500	0.499	99.8
6	LZ86	L4	True	1.000	0.930	93.0
7	LZ87	L5	True	2.500	2.339	93.6
8	LZ88	L6	True	10.000	10.480	104.8
9	LZ89	L7	True	25.000	24.409	97.6
10	LZ90	L8	True	50.000	50.336	100.7

Analyte Name	ADONA_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	376.9 / 84.8	**Result Table**	23-1034
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.00445 x + 9.37901e-5 (r = 0.99713) (weighting: 1 / x) r^2:0.9943

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.220	176.3
4	LZ84	L2	True	0.250	0.180	71.8
5	LZ85	L3	True	0.500	0.355	71.0
6	LZ86	L4	True	1.000	0.691	69.1
7	LZ87	L5	True	2.500	3.027	121.1
8	LZ88	L6	True	10.000	8.901	89.0
9	LZ89	L7	True	25.000	24.827	99.3
10	LZ90	L8	True	50.000	51.175	102.4

Analyte Name	9Cl-PF3ONS_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	530.8 / 351.0	**Result Table**	23-1034
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.46842 x + 6.55169e-4 (r = 0.99915) (weighting: 1 / x) r^2:0.9983

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.109	87.0
4	LZ84	L2	True	0.250	0.222	88.7
5	LZ85	L3	True	0.500	0.535	106.9
6	LZ86	L4	True	1.000	1.127	112.7
7	LZ87	L5	True	2.500	2.538	101.5
8	LZ88	L6	True	10.000	10.741	107.4
9	LZ89	L7	True	25.000	23.748	95.0
10	LZ90	L8	True	50.000	50.357	100.7

Analyte Name	9Cl-PF3ONS_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	532.8 / 353.0	**Result Table**	23-1034
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.15821 x + 0.00107 (r = 0.99826) (weighting: 1 / x) r^2:0.9965

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.114	91.0
4	LZ84	L2	True	0.250	0.205	82.1
5	LZ85	L3	True	0.500	0.556	111.3
6	LZ86	L4	True	1.000	1.039	104.0
7	LZ87	L5	True	2.500	2.569	102.8
8	LZ88	L6	True	10.000	11.461	114.6
9	LZ89	L7	True	25.000	23.742	95.0
10	LZ90	L8	True	50.000	49.689	99.4

Analyte Name	11Cl-PF3OUdS_1	**Data File**	AD_08212023_5-369.wiff
MRM Transition	630.9 / 450.9	**Result Table**	23-1034
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.24598 x + -0.00523 (r = 0.99932) (weighting: 1 / x) r^2:0.9986

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.137	109.5
4	LZ84	L2	True	0.250	0.246	98.2
5	LZ85	L3	True	0.500	0.488	97.6
6	LZ86	L4	True	1.000	0.990	99.0
7	LZ87	L5	True	2.500	2.203	88.1
8	LZ88	L6	True	10.000	10.821	108.2
9	LZ89	L7	True	25.000	25.219	100.9
10	LZ90	L8	True	50.000	49.273	98.6

Analyte Name	11Cl-PF3OUdS_2	**Data File**	AD_08212023_5-369.wiff
MRM Transition	632.9 / 452.9	**Result Table**	23-1034
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.37338 x + -0.00123 (r = 0.99972) (weighting: 1 / x) r^2:0.9994

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.135	108.2
4	LZ84	L2	True	0.250	0.237	94.8
5	LZ85	L3	True	0.500	0.506	101.2
6	LZ86	L4	True	1.000	1.035	103.6
7	LZ87	L5	True	2.500	2.352	94.1
8	LZ88	L6	True	10.000	9.927	99.3
9	LZ89	L7	True	25.000	24.305	97.2
10	LZ90	L8	True	50.000	50.879	101.8

Analyte Name	13C5-PFHxA	**Data File**	AD_08212023_5-369.wiff
MRM Transition	318.0 / 273.0	**Result Table**	23-1034_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.91712 x (std. dev. = 0.03324) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	4.991	99.8
4	LZ84	L2	True	5.000	5.072	101.4
5	LZ85	L3	True	5.000	5.066	101.3
6	LZ86	L4	True	5.000	5.313	106.3
7	LZ87	L5	True	5.000	5.108	102.2
8	LZ88	L6	True	5.000	4.878	97.6
9	LZ89	L7	True	5.000	4.739	94.8
10	LZ90	L8	True	5.000	4.834	96.7

Analyte Name	13C4-PFHpA	**Data File**	AD_08212023_5-369.wiff
MRM Transition	367.1 / 322.0	**Result Table**	23-1034_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.48027 x (std. dev. = 0.06547) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	5.125	102.5
4	LZ84	L2	True	5.000	5.007	100.1
5	LZ85	L3	True	5.000	4.938	98.8
6	LZ86	L4	True	5.000	5.119	102.4
7	LZ87	L5	True	5.000	5.372	107.4
8	LZ88	L6	True	5.000	5.009	100.2
9	LZ89	L7	True	5.000	4.781	95.6
10	LZ90	L8	True	5.000	4.650	93.0

Analyte Name	13C8-PFOA	**Data File**	AD_08212023_5-369.wiff
MRM Transition	421.1 / 376.0	**Result Table**	23-1034_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.28504 x (std. dev. = 0.04500) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	5.197	103.9
4	LZ84	L2	True	5.000	5.083	101.7
5	LZ85	L3	True	5.000	4.923	98.5
6	LZ86	L4	True	5.000	5.301	106.0
7	LZ87	L5	True	5.000	4.853	97.1
8	LZ88	L6	True	5.000	4.813	96.3
9	LZ89	L7	True	5.000	4.886	97.7
10	LZ90	L8	True	5.000	4.944	98.9

Analyte Name	13C9-PFNA	**Data File**	AD_08212023_5-369.wiff
MRM Transition	472.1 / 427.0	**Result Table**	23-1034_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.86802 x (std. dev. = 0.04639) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	4.997	99.9
4	LZ84	L2	True	5.000	4.917	98.3
5	LZ85	L3	True	5.000	5.097	102.0
6	LZ86	L4	True	5.000	5.406	108.1
7	LZ87	L5	True	5.000	5.302	106.1
8	LZ88	L6	True	5.000	4.858	97.2
9	LZ89	L7	True	5.000	4.854	97.1
10	LZ90	L8	True	5.000	4.568	91.4

Analyte Name	13C6-PFDA	**Data File**	AD_08212023_5-369.wiff
MRM Transition	519.1 / 474.1	**Result Table**	23-1034_SIS
Internal Standard	13C2-PFDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.36470 x (std. dev. = 0.03237) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	5.067	101.3
4	LZ84	L2	True	5.000	4.864	97.3
5	LZ85	L3	True	5.000	4.842	96.8
6	LZ86	L4	True	5.000	5.162	103.2
7	LZ87	L5	True	5.000	5.036	100.7
8	LZ88	L6	True	5.000	5.053	101.1
9	LZ89	L7	True	5.000	4.889	97.8
10	LZ90	L8	True	5.000	5.088	101.8

Analyte Name	13C7-PFUnA	**Data File**	AD_08212023_5-369.wiff
MRM Transition	570.0 / 525.1	**Result Table**	23-1034_SIS
Internal Standard	13C2-PFDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.83311 x (std. dev. = 0.07856) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	4.822	96.4
4	LZ84	L2	True	5.000	4.996	99.9
5	LZ85	L3	True	5.000	5.261	105.2
6	LZ86	L4	True	5.000	5.166	103.3
7	LZ87	L5	True	5.000	5.262	105.2
8	LZ88	L6	True	5.000	4.809	96.2
9	LZ89	L7	True	5.000	4.702	94.1
10	LZ90	L8	True	5.000	4.982	99.6

Analyte Name	13C2-PFDoA	**Data File**	AD_08212023_5-369.wiff
MRM Transition	615.1 / 570.0	**Result Table**	23-1034_SIS
Internal Standard	13C2-PFDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 2.13213 x (std. dev. = 0.10535) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	4.632	92.7
4	LZ84	L2	True	5.000	5.052	101.0
5	LZ85	L3	True	5.000	5.155	103.1
6	LZ86	L4	True	5.000	5.187	103.7
7	LZ87	L5	True	5.000	4.975	99.5
8	LZ88	L6	True	5.000	4.903	98.1
9	LZ89	L7	True	5.000	4.720	94.4
10	LZ90	L8	True	5.000	5.376	107.5

Analyte Name	13C2-PFTeDA	**Data File**	AD_08212023_5-369.wiff
MRM Transition	715.2 / 670.0	**Result Table**	23-1034_SIS
Internal Standard	13C2-PFDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.34775 x (std. dev. = 0.06798) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	4.881	97.6
4	LZ84	L2	True	5.000	4.746	94.9
5	LZ85	L3	True	5.000	4.845	96.9
6	LZ86	L4	True	5.000	4.883	97.7
7	LZ87	L5	True	5.000	5.038	100.8
8	LZ88	L6	True	5.000	5.209	104.2
9	LZ89	L7	True	5.000	4.879	97.6
10	LZ90	L8	True	5.000	5.519	110.4

Analyte Name	13C3-PFBS	**Data File**	AD_08212023_5-369.wiff
MRM Transition	302.1 / 79.9	**Result Table**	23-1034_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 5.66372 x (std. dev. = 0.24955) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	4.660	4.505	96.7
4	LZ84	L2	True	4.660	4.911	105.4
5	LZ85	L3	True	4.660	4.820	103.4
6	LZ86	L4	True	4.660	4.810	103.2
7	LZ87	L5	True	4.660	4.684	100.5
8	LZ88	L6	True	4.660	4.710	101.1
9	LZ89	L7	True	4.660	4.276	91.8
10	LZ90	L8	True	4.660	4.564	97.9

Analyte Name	13C3-PFHxS	**Data File**	AD_08212023_5-369.wiff
MRM Transition	402.1 / 79.9	**Result Table**	23-1034_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 4.29958 x (std. dev. = 0.22522) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	4.740	4.343	91.6
4	LZ84	L2	True	4.740	5.001	105.5
5	LZ85	L3	True	4.740	4.567	96.4
6	LZ86	L4	True	4.740	4.808	101.4
7	LZ87	L5	True	4.740	4.650	98.1
8	LZ88	L6	True	4.740	4.569	96.4
9	LZ89	L7	True	4.740	4.932	104.1
10	LZ90	L8	True	4.740	5.051	106.6

Analyte Name	13C8-PFOS	**Data File**	AD_08212023_5-369.wiff
MRM Transition	507.1 / 79.9	**Result Table**	23-1034_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 2.25863 x (std. dev. = 0.21363) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	4.790	4.272	89.2
4	LZ84	L2	True	4.790	4.751	99.2
5	LZ85	L3	True	4.790	4.709	98.3
6	LZ86	L4	True	4.790	4.653	97.1
7	LZ87	L5	True	4.790	4.552	95.0
8	LZ88	L6	True	4.790	4.922	102.8
9	LZ89	L7	True	4.790	4.648	97.0
10	LZ90	L8	True	4.790	5.813	121.4

Analyte Name	d3-MeFOSAA	**Data File**	AD_08212023_5-369.wiff
MRM Transition	573.2 / 419.0	**Result Table**	23-1034_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.15337 x (std. dev. = 0.01484) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	4.875	97.5
4	LZ84	L2	True	5.000	4.271	85.4
5	LZ85	L3	True	5.000	5.250	105.0
6	LZ86	L4	True	5.000	5.247	104.9
7	LZ87	L5	True	5.000	5.073	101.5
8	LZ88	L6	True	5.000	4.400	88.0
9	LZ89	L7	True	5.000	5.118	102.4
10	LZ90	L8	True	5.000	5.767	115.3

Analyte Name	d5-EtFOSAA	**Data File**	AD_08212023_5-369.wiff
MRM Transition	589.2 / 419.0	**Result Table**	23-1034_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.15243 x (std. dev. = 0.01466) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	4.937	98.8
4	LZ84	L2	True	5.000	4.433	88.7
5	LZ85	L3	True	5.000	4.896	97.9
6	LZ86	L4	True	5.000	5.195	103.9
7	LZ87	L5	True	5.000	4.726	94.5
8	LZ88	L6	True	5.000	4.841	96.8
9	LZ89	L7	True	5.000	4.906	98.1
10	LZ90	L8	True	5.000	6.066	121.3

Analyte Name	13C3-HFPO-DA	**Data File**	AD_08212023_5-369.wiff
MRM Transition	286.9 / 168.9	**Result Table**	23-1034_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.20002 x (std. dev. = 0.00632) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	4.917	98.3
4	LZ84	L2	True	5.000	4.860	97.2
5	LZ85	L3	True	5.000	5.035	100.7
6	LZ86	L4	True	5.000	5.118	102.4
7	LZ87	L5	True	5.000	5.005	100.1
8	LZ88	L6	True	5.000	4.966	99.3
9	LZ89	L7	True	5.000	4.798	96.0
10	LZ90	L8	True	5.000	5.302	106.0

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	Isotope Dilution Calibration Curve Concentrations (ng/mL)									IB (ng/mL)	ICC (ng/mL)
	LZ82	LZ83	LZ84	LZ85	LZ86	LZ87	LZ88	LZ89	LZ90	LZ91	LZ92
PFMPA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFEESA	0.045	0.112	0.223	0.446	0.892	2.230	8.920	22.300	44.600	-	2.230
NFDHA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFMBA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFBA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFPeA	0.051	0.126	0.253	0.505	1.010	2.525	10.100	25.250	50.500	-	2.525
PFHxA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFHpA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFOA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFNA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFDA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFUnA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFDoA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFTrDA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFTeDA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFHxDA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFODA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
NMeFOSAA (Branched)	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
NEtFOSAA (Branched)	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
NMeFOSA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
NEtFOSA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
NMeFOSE	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
NEtFOSE	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFOSA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFBS	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFPeS	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFHxS (Branched)	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFHpS	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFOS (Branched)	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFNS	0.051	0.126	0.253	0.505	1.010	2.525	10.100	25.250	50.500	-	2.525
PFDS	0.051	0.126	0.253	0.505	1.010	2.525	10.100	25.250	50.500	-	2.525
PFDoS	0.049	0.121	0.243	0.485	0.970	2.425	9.700	24.250	48.500	-	2.425
4:2FTS	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
6:2FTS	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
8:2FTS	0.051	0.126	0.253	0.505	1.010	2.525	10.100	25.250	50.500	-	2.525
10:2FTS	0.048	0.121	0.242	0.483	0.966	2.415	9.660	24.150	48.300	-	2.415
3:3 FTCA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
5:3 FTCA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
7:3 FTCA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
HFPO-DA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
Adona	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
9Cl-PF3ONS	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
11Cl-PF3OUdS	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
	Surrogates / Extracted Internal Standards										
13C4-PFBA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C5-PFPeA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C5-PFHxA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C4-PFHpA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C8-PFOA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C9-PFNA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C6-PFDA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C7-PFUnA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C2-PFDoA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C2-PFTeDA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C2-PFHxDA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
d3-MeFOSAA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
d5-EtFOSAA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
D3-MeFOSA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
D5-EtFOSA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
D7-MeFOSE	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
D9-EtFOSE	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C8-FOSA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C3-PFBS	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.660
13C3-PFHxS	4.740	4.740	4.740	4.740	4.740	4.740	4.740	4.740	4.740	4.740	4.740
13C8-PFOS	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790
13C2-4:2FTS	4.690	4.690	4.690	4.690	4.690	4.690	4.690	4.690	4.690	4.690	4.690
13C2-6:2FTS	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.760
13C2-8:2FTS	4.800	4.800	4.800	4.800	4.800	4.800	4.800	4.800	4.800	4.800	4.800
13C3-HFPO-DA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
	Internal Standards										
13C3-PFBA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C2-PFOA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C2-PFDA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C4-PFOS	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790

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PFAS Calibration Quant Report

Created with Analyst Reporter
Printed: 23/08/2023 10:29:58 AM

Sample Name	LZ83	**Injection Vial**	3
Sample ID	L1	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.22	53730.84	0.158	203.1	6.20	13C5-PFHxA	1852421.12	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.21	1530.11	0.155	46.2	6.20	13C5-PFHxA	1852421.12	5.000	PFHxA	0.029	0.025	✓
PFHpA_1	363.1 / 319.0	6.94	82011.65	0.144	231.0	6.92	13C4-PFHpA	3069879.64	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	6.94	1179.16	0.112	84.9	6.92	13C4-PFHpA	3069879.64	5.000	PFHpA	0.014	0.015	✓
PFOA_1	413.0 / 369.0	7.49	63479.13	0.130	209.7	7.47	13C8-PFOA	2702551.37	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.50	1927.94	0.121	116.9	7.47	13C8-PFOA	2702551.37	5.000	PFOA	0.030	0.037	✓
PFNA_1	463.0 / 419.0	7.97	56723.49	0.234	210.4	7.95	13C9-PFNA	1755197.11	5.000	PFNA			
PFNA_2	463.0 / 219.0	7.97	5677.02	0.137	114840.6	7.95	13C9-PFNA	1755197.11	5.000	PFNA	0.100	0.167	✓
PFDA_1	512.9 / 469.0	8.40	17689.27	0.130	141.9	8.38	13C6-PFDA	1481016.35	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.39	857.19	0.203	4736.4	8.38	13C6-PFDA	1481016.35	5.000	PFDA	0.049	0.028	
PFUnA_1	563.1 / 519.0	8.81	40917.32	0.150	205.2	8.79	13C7-PFUnA	1893097.94	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	8.80	2571.37	0.155	18031.8	8.79	13C7-PFUnA	1893097.94	5.000	PFUnA	0.063	0.051	✓
PFDoA_1	613.1 / 569.0	9.21	30170.22	0.162	221.4	9.19	13C2-PFDoA	2115292.02	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.20	4309.85	0.112	620.0	9.19	13C2-PFDoA	2115292.02	5.000	PFDoA	0.143	0.187	✓
PFTrDA_1	663.0 / 619.0	9.60	37336.87	0.121	221.8	9.95	13C2-PFTeDA	1408770.18	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	9.60	348.28	0.063	7495.4	9.95	13C2-PFTeDA	1408770.18	5.000	PFTrDA	0.009	0.026	
PFTeDA_1	713.0 / 669.0	9.97	33216.12	0.124	329.4	9.95	13C2-PFTeDA	1408770.18	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	9.97	774.47	0.103	26580.6	9.95	13C2-PFTeDA	1408770.18	5.000	PFTeDA	0.023	0.021	✓
PFBS_1	298.7 / 79.9	6.12	2333.13	0.098	7795.6	6.09	13C3-PFBS	427745.94	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.11	2767.45	0.108	163.5	6.09	13C3-PFBS	427745.94	4.660	PFBS	1.186	1.105	✓
PFHxS_1	399.0 / 80.0	7.57	9349.09	0.155	5377.0	7.56	13C3-PFHxS	313017.91	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.57	3236.74	0.135	203.1	7.56	13C3-PFHxS	313017.91	4.740	PFHxS	0.346	0.398	✓
PFOS_1	498.9 / 79.9	8.52	2746.94	0.112	167.7	8.51	13C8-PFOS	161758.18	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.53	544.95	0.121	8057.6	8.51	13C8-PFOS	161758.18	4.790	PFOS	0.198	0.227	✓
NMeFOSAA_1	570.1 / 419.0	8.43	5307.16	0.104	400684.3	8.42	d3-MeFOSAA	302576.08	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.42	757.34	0.207	432.5	8.42	d3-MeFOSAA	302576.08	5.000	NMeFOSAA	0.143	0.063	
NEtFOSAA_1	584.2 / 419.1	8.60	6177.82	0.123	333769.6	8.58	d5-EtFOSAA	304551.17	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.60	7287.96	0.129	121.2	8.58	d5-EtFOSAA	304551.17	5.000	NEtFOSAA	1.180	1.135	✓
HFPO-DA_1	284.9 / 168.9	6.47	10809.25	0.132	950.9	6.46	13C3-HFPO-DA	397995.73	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.46	2873.79	0.110	59.7	6.46	13C3-HFPO-DA	397995.73	5.000	HFPO-DA	0.266	0.175	
ADONA_1	376.9 / 250.9	7.14	116431.31	0.145	2396735.5	7.47	13C8-PFOA	2702551.37	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.15	783.48	0.220	84919.0	7.47	13C8-PFOA	2702551.37	5.000	ADONA	0.007	0.003	
9Cl-PF3ONS_1	530.8 / 351.0	8.81	29301.75	0.109	92043.8	7.47	13C8-PFOA	2702551.37	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	8.81	12630.63	0.114	639.1	7.47	13C8-PFOA	2702551.37	5.000	9Cl-PF3ONS	0.431	0.356	✓
11Cl-PF3OUdS_1	630.9 / 450.9	9.63	78042.83	0.137	863.1	7.47	13C8-PFOA	2702551.37	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	9.63	23985.02	0.135	1084.2	7.47	13C8-PFOA	2702551.37	5.000	11Cl-PF3OUdS	0.307	0.303	✓

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PFAS Calibration Quant Report

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Sample Name	LZ84	**Injection Vial**	4
Sample ID	L2	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:21:58 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.22	116815.01	0.257	409.5	6.20	13C5-PFHxA	2158168.12	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.22	2975.08	0.250	96.2	6.20	13C5-PFHxA	2158168.12	5.000	PFHxA	0.026	0.025	✓
PFHpA_1	363.1 / 319.0	6.94	173017.72	0.245	252.0	6.92	13C4-PFHpA	3438928.61	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	6.94	3294.96	0.290	1331.3	6.92	13C4-PFHpA	3438928.61	5.000	PFHpA	0.019	0.015	✓
PFOA_1	413.0 / 369.0	7.50	153696.81	0.262	341.9	7.48	13C8-PFOA	3030810.49	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.50	6822.97	0.318	352.7	7.48	13C8-PFOA	3030810.49	5.000	PFOA	0.044	0.037	✓
PFNA_1	463.0 / 419.0	7.97	96028.39	0.309	345.2	7.95	13C9-PFNA	1980254.68	5.000	PFNA			
PFNA_2	463.0 / 219.0	7.97	16445.56	0.285	12185.3	7.95	13C9-PFNA	1980254.68	5.000	PFNA	0.171	0.167	✓
PFDA_1	512.9 / 469.0	8.40	37441.91	0.240	338.5	8.38	13C6-PFDA	1546446.93	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.41	477.01	0.111	2075.6	8.38	13C6-PFDA	1546446.93	5.000	PFDA	0.013	0.028	
PFUnA_1	563.1 / 519.0	8.81	94107.33	0.273	358.4	8.79	13C7-PFUnA	2133633.23	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	8.81	4674.04	0.249	186032.0	8.79	13C7-PFUnA	2133633.23	5.000	PFUnA	0.050	0.051	✓
PFDoA_1	613.1 / 569.0	9.21	51318.11	0.222	284.5	9.19	13C2-PFDoA	2509643.21	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.21	14272.07	0.314	973.9	9.19	13C2-PFDoA	2509643.21	5.000	PFDoA	0.278	0.187	✓
PFTrDA_1	663.0 / 619.0	9.60	86266.12	0.258	361.9	9.95	13C2-PFTeDA	1490395.92	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	9.60	2585.56	0.310	843914.0	9.95	13C2-PFTeDA	1490395.92	5.000	PFTrDA	0.030	0.026	✓
PFTeDA_1	713.0 / 669.0	9.97	68935.32	0.256	484.6	9.95	13C2-PFTeDA	1490395.92	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	9.98	1474.51	0.232	2695.5	9.95	13C2-PFTeDA	1490395.92	5.000	PFTeDA	0.021	0.021	✓
PFBS_1	298.7 / 79.9	6.12	6232.51	0.272	1130.8	6.10	13C3-PFBS	490415.46	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.12	7086.91	0.281	216.0	6.10	13C3-PFBS	490415.46	4.660	PFBS	1.137	1.105	✓
PFHxS_1	399.0 / 80.0	7.57	18777.73	0.239	14948.3	7.56	13C3-PFHxS	379075.86	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.57	8428.99	0.265	200.6	7.56	13C3-PFHxS	379075.86	4.740	PFHxS	0.449	0.398	✓
PFOS_1	498.9 / 79.9	8.53	7985.17	0.300	5538.1	8.51	13C8-PFOS	189197.89	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.52	1185.74	0.212	55.0	8.51	13C8-PFOS	189197.89	4.790	PFOS	0.149	0.227	✓
NMeFOSAA_1	570.1 / 419.0	8.43	14451.90	0.285	40590.2	8.42	d3-MeFOSAA	303911.56	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.44	664.37	0.171	56.8	8.42	d3-MeFOSAA	303911.56	5.000	NMeFOSAA	0.046	0.063	✓
NEtFOSAA_1	584.2 / 419.1	8.60	12422.56	0.246	691.2	8.58	d5-EtFOSAA	313498.54	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.60	13995.80	0.244	974.5	8.58	d5-EtFOSAA	313498.54	5.000	NEtFOSAA	1.127	1.135	✓
HFPO-DA_1	284.9 / 168.9	6.48	23602.83	0.237	1093.5	6.46	13C3-HFPO-DA	451024.17	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.47	5743.61	0.278	129.0	6.46	13C3-HFPO-DA	451024.17	5.000	HFPO-DA	0.243	0.175	✓
ADONA_1	376.9 / 250.9	7.14	237762.80	0.237	6401.9	7.48	13C8-PFOA	3030810.49	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.15	768.59	0.180	58.2	7.48	13C8-PFOA	3030810.49	5.000	ADONA	0.003	0.003	✓
9Cl-PF3ONS_1	530.8 / 351.0	8.81	64968.23	0.222	1326.9	7.48	13C8-PFOA	3030810.49	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	8.81	22928.85	0.205	1115.8	7.48	13C8-PFOA	3030810.49	5.000	9Cl-PF3ONS	0.353	0.356	✓
11Cl-PF3OUdS_1	630.9 / 450.9	9.63	169588.76	0.246	1500.6	7.48	13C8-PFOA	3030810.49	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	9.63	49907.99	0.237	955.6	7.48	13C8-PFOA	3030810.49	5.000	11Cl-PF3OUdS	0.294	0.303	✓

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PFAS Calibration Quant Report

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Sample Name	LZ85	**Injection Vial**	5
Sample ID	L3	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:38:02 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.22	211621.59	0.486	501.2	6.19	13C5-PFHxA	1882876.11	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.21	5209.87	0.488	142.5	6.19	13C5-PFHxA	1882876.11	5.000	PFHxA	0.025	0.025	✓
PFHpA_1	363.1 / 319.0	6.94	333118.53	0.511	546.2	6.92	13C4-PFHpA	2961797.21	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	6.94	5984.28	0.619	288.1	6.92	13C4-PFHpA	2961797.21	5.000	PFHpA	0.018	0.015	✓
PFOA_1	413.0 / 369.0	7.49	249178.33	0.485	483.1	7.47	13C8-PFOA	2563533.71	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.49	7880.36	0.423	419.9	7.47	13C8-PFOA	2563533.71	5.000	PFOA	0.032	0.037	✓
PFNA_1	463.0 / 419.0	7.97	160895.51	0.501	382.6	7.94	13C9-PFNA	1792988.78	5.000	PFNA			
PFNA_2	463.0 / 219.0	7.96	29509.51	0.524	900197.8	7.94	13C9-PFNA	1792988.78	5.000	PFNA	0.183	0.167	✓
PFDA_1	512.9 / 469.0	8.39	83615.51	0.593	467.7	8.37	13C6-PFDA	1311031.34	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.40	1620.86	0.425	2823.5	8.37	13C6-PFDA	1311031.34	5.000	PFDA	0.019	0.028	✓
PFUnA_1	563.1 / 519.0	8.80	159364.44	0.485	662.9	8.79	13C7-PFUnA	1913677.56	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	8.80	8488.33	0.503	4635.8	8.79	13C7-PFUnA	1913677.56	5.000	PFUnA	0.053	0.051	✓
PFDoA_1	613.1 / 569.0	9.21	102508.44	0.480	504.0	9.19	13C2-PFDoA	2180890.68	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.21	17432.68	0.441	67807.2	9.19	13C2-PFDoA	2180890.68	5.000	PFDoA	0.170	0.187	✓
PFTrDA_1	663.0 / 619.0	9.60	155363.55	0.531	477.2	9.95	13C2-PFTeDA	1295605.33	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	9.60	4255.55	0.567	13712.6	9.95	13C2-PFTeDA	1295605.33	5.000	PFTrDA	0.027	0.026	✓
PFTeDA_1	713.0 / 669.0	9.97	114488.55	0.500	775.6	9.95	13C2-PFTeDA	1295605.33	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	9.96	2236.96	0.449	609.1	9.95	13C2-PFTeDA	1295605.33	5.000	PFTeDA	0.020	0.021	✓
PFBS_1	298.7 / 79.9	6.11	10511.05	0.558	83943.5	6.09	13C3-PFBS	427459.67	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.11	11832.28	0.568	433.2	6.09	13C3-PFBS	427459.67	4.660	PFBS	1.126	1.105	✓
PFHxS_1	399.0 / 80.0	7.57	35305.24	0.519	2426745.8	7.55	13C3-PFHxS	307501.94	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.57	14339.16	0.531	255.8	7.55	13C3-PFHxS	307501.94	4.740	PFHxS	0.406	0.398	✓
PFOS_1	498.9 / 79.9	8.51	10694.45	0.463	662.3	8.51	13C8-PFOS	166569.50	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.52	2856.37	0.552	29188.3	8.51	13C8-PFOS	166569.50	4.790	PFOS	0.267	0.227	✓
NMeFOSAA_1	570.1 / 419.0	8.43	23791.92	0.438	399.7	8.42	d3-MeFOSAA	326258.08	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.38	1036.78	0.282	25.2	8.42	d3-MeFOSAA	326258.08	5.000	NMeFOSAA	0.044	0.063	✓
NEtFOSAA_1	584.2 / 419.1	8.59	23607.17	0.488	604.0	8.58	d5-EtFOSAA	302441.00	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.59	25698.52	0.469	723.4	8.58	d5-EtFOSAA	302441.00	5.000	NEtFOSAA	1.089	1.135	✓
HFPO-DA_1	284.9 / 168.9	6.47	47095.90	0.501	2423.6	6.46	13C3-HFPO-DA	408088.78	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.47	7599.37	0.458	159.7	6.46	13C3-HFPO-DA	408088.78	5.000	HFPO-DA	0.161	0.175	✓
ADONA_1	376.9 / 250.9	7.14	456060.83	0.499	46767.4	7.47	13C8-PFOA	2563533.71	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.13	1049.92	0.355	5511.1	7.47	13C8-PFOA	2563533.71	5.000	ADONA	0.002	0.003	✓
9Cl-PF3ONS_1	530.8 / 351.0	8.81	130075.88	0.535	3574.0	7.47	13C8-PFOA	2563533.71	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	8.81	47870.51	0.556	1332.8	7.47	13C8-PFOA	2563533.71	5.000	9Cl-PF3ONS	0.368	0.356	✓
11Cl-PF3OUdS_1	630.9 / 450.9	9.63	298341.79	0.488	2259.6	7.47	13C8-PFOA	2563533.71	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	9.63	93709.03	0.506	1163.7	7.47	13C8-PFOA	2563533.71	5.000	11Cl-PF3OUdS	0.314	0.303	✓

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PFAS Calibration Quant Report

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Sample Name	LZ86	**Injection Vial**	6
Sample ID	L4	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:54:06 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.21	448535.12	0.941	608.4	6.19	13C5-PFHxA	1969346.35	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.22	10330.82	0.914	246.8	6.19	13C5-PFHxA	1969346.35	5.000	PFHxA	0.023	0.025	✓
PFHpA_1	363.1 / 319.0	6.93	683901.13	0.986	699.3	6.92	13C4-PFHpA	3062641.09	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	6.93	9463.20	0.950	33741.3	6.92	13C4-PFHpA	3062641.09	5.000	PFHpA	0.014	0.015	✓
PFOA_1	413.0 / 369.0	7.49	551822.11	0.982	1012.7	7.47	13C8-PFOA	2753087.41	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.48	19743.08	0.948	500.2	7.47	13C8-PFOA	2753087.41	5.000	PFOA	0.036	0.037	✓
PFNA_1	463.0 / 419.0	7.96	372268.29	0.996	638.2	7.94	13C9-PFNA	1896463.70	5.000	PFNA			
PFNA_2	463.0 / 219.0	7.96	58691.61	0.947	35338.8	7.94	13C9-PFNA	1896463.70	5.000	PFNA	0.158	0.167	✓
PFDA_1	512.9 / 469.0	8.39	154918.62	0.958	487.5	8.37	13C6-PFDA	1482150.19	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.39	5113.62	1.173	29161.6	8.37	13C6-PFDA	1482150.19	5.000	PFDA	0.033	0.028	✓
PFUnA_1	563.1 / 519.0	8.80	330214.92	0.933	889.6	8.78	13C7-PFUnA	1992637.58	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	8.80	16208.28	0.921	65857.8	8.78	13C7-PFUnA	1992637.58	5.000	PFUnA	0.049	0.051	✓
PFDoA_1	613.1 / 569.0	9.20	221922.13	0.950	708.6	9.19	13C2-PFDoA	2327005.15	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.20	42155.13	1.002	193914.4	9.19	13C2-PFDoA	2327005.15	5.000	PFDoA	0.190	0.187	✓
PFTrDA_1	663.0 / 619.0	9.60	336521.27	1.071	756.5	9.94	13C2-PFTeDA	1384775.29	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	9.60	9090.88	1.110	399.2	9.94	13C2-PFTeDA	1384775.29	5.000	PFTrDA	0.027	0.026	✓
PFTeDA_1	713.0 / 669.0	9.96	260910.08	1.080	1098.9	9.94	13C2-PFTeDA	1384775.29	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	9.95	6331.64	1.283	9656.6	9.94	13C2-PFTeDA	1384775.29	5.000	PFTeDA	0.024	0.021	✓
PFBS_1	298.7 / 79.9	6.11	19780.71	1.028	910.7	6.09	13C3-PFBS	448451.01	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.11	19492.04	0.911	443.9	6.09	13C3-PFBS	448451.01	4.660	PFBS	0.985	1.105	✓
PFHxS_1	399.0 / 80.0	7.57	74012.65	0.958	11979.3	7.55	13C3-PFHxS	340240.06	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.56	28229.69	0.926	480.1	7.55	13C3-PFHxS	340240.06	4.740	PFHxS	0.381	0.398	✓
PFOS_1	498.9 / 79.9	8.52	23677.79	1.003	6226.1	8.50	13C8-PFOS	172966.94	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.52	5774.01	1.060	508.5	8.50	13C8-PFOS	172966.94	4.790	PFOS	0.244	0.227	✓
NMeFOSAA_1	570.1 / 419.0	8.42	60578.67	1.121	2749237.0	8.41	d3-MeFOSAA	325236.25	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.37	3876.30	1.259	167.9	8.41	d3-MeFOSAA	325236.25	5.000	NMeFOSAA	0.064	0.063	✓
NEtFOSAA_1	584.2 / 419.1	8.59	51200.47	1.006	3752887.3	8.58	d5-EtFOSAA	320065.03	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.59	57965.51	1.004	416.2	8.58	d5-EtFOSAA	320065.03	5.000	NEtFOSAA	1.132	1.135	✓
HFPO-DA_1	284.9 / 168.9	6.47	106452.52	1.095	2262.4	6.46	13C3-HFPO-DA	413758.47	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.47	16552.84	1.111	367.6	6.46	13C3-HFPO-DA	413758.47	5.000	HFPO-DA	0.156	0.175	✓
ADONA_1	376.9 / 250.9	7.14	941290.15	0.930	1065654.0	7.47	13C8-PFOA	2753087.41	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.14	1951.45	0.691	634.5	7.47	13C8-PFOA	2753087.41	5.000	ADONA	0.002	0.003	✓
9Cl-PF3ONS_1	530.8 / 351.0	8.80	292593.80	1.127	3810.9	7.47	13C8-PFOA	2753087.41	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	8.80	93507.41	1.039	3747.6	7.47	13C8-PFOA	2753087.41	5.000	9Cl-PF3ONS	0.320	0.356	✓
11Cl-PF3OUdS_1	630.9 / 450.9	9.62	664518.69	0.990	2255.9	7.47	13C8-PFOA	2753087.41	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	9.62	209506.23	1.035	1658.4	7.47	13C8-PFOA	2753087.41	5.000	11Cl-PF3OUdS	0.315	0.303	✓

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PFAS Calibration Quant Report

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Sample Name	LZ87	**Injection Vial**	7
Sample ID	L5	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:10:10 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.21	1105513.94	2.119	1034.2	6.19	13C5-PFHxA	2100089.22	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.21	26765.69	2.201	587.0	6.19	13C5-PFHxA	2100089.22	5.000	PFHxA	0.024	0.025	✓
PFHpA_1	363.1 / 319.0	6.94	1721676.38	2.098	1199.7	6.92	13C4-PFHpA	3564906.96	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	6.94	22194.19	1.922	677.1	6.92	13C4-PFHpA	3564906.96	5.000	PFHpA	0.013	0.015	✓
PFOA_1	413.0 / 369.0	7.49	1296143.06	2.249	1063.1	7.47	13C8-PFOA	2796067.44	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.49	50631.19	2.348	1618.0	7.47	13C8-PFOA	2796067.44	5.000	PFOA	0.039	0.037	✓
PFNA_1	463.0 / 419.0	7.96	924757.34	2.166	966.1	7.94	13C9-PFNA	2063439.21	5.000	PFNA			
PFNA_2	463.0 / 219.0	7.96	160404.24	2.315	119430.2	7.94	13C9-PFNA	2063439.21	5.000	PFNA	0.174	0.167	✓
PFDA_1	512.9 / 469.0	8.39	393855.14	2.355	1240.6	8.37	13C6-PFDA	1510740.95	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.39	9869.67	2.214	222286.1	8.37	13C6-PFDA	1510740.95	5.000	PFDA	0.025	0.028	✓
PFUnA_1	563.1 / 519.0	8.80	822036.95	2.139	1086.2	8.79	13C7-PFUnA	2120041.80	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	8.81	40688.17	2.173	1453229.9	8.79	13C7-PFUnA	2120041.80	5.000	PFUnA	0.050	0.051	✓
PFDoA_1	613.1 / 569.0	9.21	532452.53	2.241	1012.8	9.19	13C2-PFDoA	2331474.00	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.21	96877.47	2.299	43460.3	9.19	13C2-PFDoA	2331474.00	5.000	PFDoA	0.182	0.187	✓
PFTrDA_1	663.0 / 619.0	9.60	810119.09	2.386	977.7	9.95	13C2-PFTeDA	1492510.72	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	9.60	22533.36	2.524	5855.2	9.95	13C2-PFTeDA	1492510.72	5.000	PFTrDA	0.028	0.026	✓
PFTeDA_1	713.0 / 669.0	9.97	597156.29	2.308	1614.1	9.95	13C2-PFTeDA	1492510.72	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	9.97	12932.46	2.484	431.1	9.95	13C2-PFTeDA	1492510.72	5.000	PFTeDA	0.022	0.021	✓
PFBS_1	298.7 / 79.9	6.11	49414.77	2.500	769.1	6.09	13C3-PFBS	469293.19	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.11	52208.56	2.382	838.4	6.09	13C3-PFBS	469293.19	4.660	PFBS	1.057	1.105	✓
PFHxS_1	399.0 / 80.0	7.57	182144.80	2.233	8145.5	7.55	13C3-PFHxS	353649.24	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.56	75829.19	2.358	1182.6	7.55	13C3-PFHxS	353649.24	4.740	PFHxS	0.416	0.398	✓
PFOS_1	498.9 / 79.9	8.52	61214.75	2.486	3644.1	8.51	13C8-PFOS	181846.99	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.52	14783.45	2.560	571.4	8.51	13C8-PFOS	181846.99	4.790	PFOS	0.242	0.227	✓
NMeFOSAA_1	570.1 / 419.0	8.43	140744.05	2.430	24774.8	8.41	d3-MeFOSAA	348798.59	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.42	6442.11	1.991	40746.8	8.41	d3-MeFOSAA	348798.59	5.000	NMeFOSAA	0.046	0.063	✓
NEtFOSAA_1	584.2 / 419.1	8.59	137842.73	2.692	663.4	8.58	d5-EtFOSAA	322983.24	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.59	144280.24	2.482	6415.2	8.58	d5-EtFOSAA	322983.24	5.000	NEtFOSAA	1.047	1.135	✓
HFPO-DA_1	284.9 / 168.9	6.47	249132.85	2.342	3945.6	6.46	13C3-HFPO-DA	448803.80	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.47	38954.90	2.540	606.7	6.46	13C3-HFPO-DA	448803.80	5.000	HFPO-DA	0.156	0.175	✓
ADONA_1	376.9 / 250.9	7.14	2455147.54	2.339	8521.4	7.47	13C8-PFOA	2796067.44	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.14	7793.34	3.027	5867.9	7.47	13C8-PFOA	2796067.44	5.000	ADONA	0.003	0.003	✓
9Cl-PF3ONS_1	530.8 / 351.0	8.81	666546.42	2.538	3260.7	7.47	13C8-PFOA	2796067.44	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	8.81	230303.05	2.569	23980.0	7.47	13C8-PFOA	2796067.44	5.000	9Cl-PF3ONS	0.346	0.356	✓
11Cl-PF3OUdS_1	630.9 / 450.9	9.63	1520069.49	2.203	2596.9	7.47	13C8-PFOA	2796067.44	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	9.63	487588.69	2.352	2412.0	7.47	13C8-PFOA	2796067.44	5.000	11Cl-PF3OUdS	0.321	0.303	✓

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PFAS Calibration Quant Report

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Sample Name	LZ88	**Injection Vial**	8
Sample ID	L6	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:26:12 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.22	4050969.66	9.458	1655.0	6.19	13C5-PFHxA	1696610.48	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.22	96757.91	9.804	1003.3	6.19	13C5-PFHxA	1696610.48	5.000	PFHxA	0.024	0.025	✓
PFHpA_1	363.1 / 319.0	6.94	6886704.53	10.517	2159.5	6.92	13C4-PFHpA	2812269.20	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	6.94	90611.65	9.972	4391.1	6.92	13C4-PFHpA	2812269.20	5.000	PFHpA	0.013	0.015	✓
PFOA_1	413.0 / 369.0	7.49	5196035.85	10.683	2798.2	7.47	13C8-PFOA	2345771.36	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.49	189702.61	10.383	1666.4	7.47	13C8-PFOA	2345771.36	5.000	PFOA	0.037	0.037	✓
PFNA_1	463.0 / 419.0	7.97	3124967.65	9.164	1780.7	7.94	13C9-PFNA	1599393.00	5.000	PFNA			
PFNA_2	463.0 / 219.0	7.97	532953.93	9.784	12034.1	7.94	13C9-PFNA	1599393.00	5.000	PFNA	0.171	0.167	✓
PFDA_1	512.9 / 469.0	8.39	1330825.93	9.213	1930.0	8.37	13C6-PFDA	1295166.90	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.39	38500.35	10.051	3424.4	8.37	13C6-PFDA	1295166.90	5.000	PFDA	0.029	0.028	✓
PFUnA_1	563.1 / 519.0	8.80	2877256.43	9.471	2071.9	8.78	13C7-PFUnA	1655840.16	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	8.80	144193.13	9.855	18796.4	8.78	13C7-PFUnA	1655840.16	5.000	PFUnA	0.050	0.051	✓
PFDoA_1	613.1 / 569.0	9.21	2000880.08	9.915	1849.8	9.19	13C2-PFDoA	1963571.25	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.21	368145.62	10.376	5162.6	9.19	13C2-PFDoA	1963571.25	5.000	PFDoA	0.184	0.187	✓
PFTrDA_1	663.0 / 619.0	9.60	2634112.63	8.769	2014.1	9.95	13C2-PFTeDA	1318616.32	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	9.60	78116.98	9.839	7099.6	9.95	13C2-PFTeDA	1318616.32	5.000	PFTrDA	0.030	0.026	✓
PFTeDA_1	713.0 / 669.0	9.97	2203396.71	9.680	2275.2	9.95	13C2-PFTeDA	1318616.32	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	9.97	49401.50	10.932	679.7	9.95	13C2-PFTeDA	1318616.32	5.000	PFTeDA	0.022	0.021	✓
PFBS_1	298.7 / 79.9	6.11	150440.61	9.652	30584.7	6.10	13C3-PFBS	373726.99	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.11	169584.61	9.813	1585.8	6.10	13C3-PFBS	373726.99	4.660	PFBS	1.127	1.105	✓
PFHxS_1	399.0 / 80.0	7.57	582878.79	9.097	4192.3	7.55	13C3-PFHxS	275211.15	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.57	236760.76	9.393	2425.8	7.55	13C3-PFHxS	275211.15	4.740	PFHxS	0.406	0.398	✓
PFOS_1	498.9 / 79.9	8.52	197200.16	9.387	4827.9	8.51	13C8-PFOS	155764.33	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.52	47354.92	9.530	649.0	8.51	13C8-PFOS	155764.33	4.790	PFOS	0.240	0.227	✓
NMeFOSAA_1	570.1 / 419.0	8.43	458424.06	10.794	589.9	8.42	d3-MeFOSAA	255927.67	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.43	25095.92	10.883	527.5	8.42	d3-MeFOSAA	255927.67	5.000	NMeFOSAA	0.055	0.063	✓
NEtFOSAA_1	584.2 / 419.1	8.59	434055.65	9.797	64865.1	8.58	d5-EtFOSAA	279858.40	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.59	537911.49	10.691	675.7	8.58	d5-EtFOSAA	279858.40	5.000	NEtFOSAA	1.239	1.135	✓
HFPO-DA_1	284.9 / 168.9	6.47	853490.52	9.503	3821.1	6.46	13C3-HFPO-DA	376686.98	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.47	119315.14	9.565	909.8	6.46	13C3-HFPO-DA	376686.98	5.000	HFPO-DA	0.140	0.175	✓
ADONA_1	376.9 / 250.9	7.14	9326228.64	10.480	13735.6	7.47	13C8-PFOA	2345771.36	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.14	18797.97	8.901	372272.9	7.47	13C8-PFOA	2345771.36	5.000	ADONA	0.002	0.003	✓
9Cl-PF3ONS_1	530.8 / 351.0	8.81	2361925.78	10.741	5261.5	7.47	13C8-PFOA	2345771.36	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	8.81	853172.72	11.461	4335.4	7.47	13C8-PFOA	2345771.36	5.000	9Cl-PF3ONS	0.361	0.356	✓
11Cl-PF3OUdS_1	630.9 / 450.9	9.63	6312931.91	10.821	4036.1	7.47	13C8-PFOA	2345771.36	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	9.63	1735999.42	9.927	3634.6	7.47	13C8-PFOA	2345771.36	5.000	11Cl-PF3OUdS	0.275	0.303	✓

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PFAS Calibration Quant Report

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Sample Name	LZ89	**Injection Vial**	9
Sample ID	L7	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:42:16 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.22	10217690.69	24.280	3023.9	6.19	13C5-PFHxA	1662252.72	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.21	239598.64	24.757	2012.1	6.19	13C5-PFHxA	1662252.72	5.000	PFHxA	0.023	0.025	✓
PFHpA_1	363.1 / 319.0	6.94	14845107.31	23.519	2913.4	6.92	13C4-PFHpA	2706701.09	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	6.94	208203.92	23.816	3869.6	6.92	13C4-PFHpA	2706701.09	5.000	PFHpA	0.014	0.015	✓
PFOA_1	413.0 / 369.0	7.49	12387963.46	24.853	3048.6	7.47	13C8-PFOA	2401677.04	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.49	458044.60	24.445	2584.9	7.47	13C8-PFOA	2401677.04	5.000	PFOA	0.037	0.037	✓
PFNA_1	463.0 / 419.0	7.96	7974040.50	23.078	2827.9	7.94	13C9-PFNA	1611674.55	5.000	PFNA			
PFNA_2	463.0 / 219.0	7.96	1243525.54	22.599	78293.4	7.94	13C9-PFNA	1611674.55	5.000	PFNA	0.156	0.167	✓
PFDA_1	512.9 / 469.0	8.39	3355016.98	23.824	2809.2	8.37	13C6-PFDA	1260732.82	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.39	96235.13	25.798	642.6	8.37	13C6-PFDA	1260732.82	5.000	PFDA	0.029	0.028	✓
PFUnA_1	563.1 / 519.0	8.80	7202339.80	24.049	3032.2	8.78	13C7-PFUnA	1628788.39	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	8.80	342893.44	23.824	4236.4	8.78	13C7-PFUnA	1628788.39	5.000	PFUnA	0.048	0.051	✓
PFDoA_1	613.1 / 569.0	9.20	4965490.61	25.372	2933.5	9.19	13C2-PFDoA	1901441.15	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.20	884651.17	25.750	3418.5	9.19	13C2-PFDoA	1901441.15	5.000	PFDoA	0.178	0.187	✓
PFTrDA_1	663.0 / 619.0	9.60	7241108.52	25.572	2604.9	9.94	13C2-PFTeDA	1242635.54	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	9.60	194595.18	25.971	4356.5	9.94	13C2-PFTeDA	1242635.54	5.000	PFTrDA	0.027	0.026	✓
PFTeDA_1	713.0 / 669.0	9.96	5418376.53	25.280	2892.5	9.94	13C2-PFTeDA	1242635.54	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	9.96	105852.07	24.930	2356.4	9.94	13C2-PFTeDA	1242635.54	5.000	PFTeDA	0.020	0.021	✓
PFBS_1	298.7 / 79.9	6.11	341078.15	25.812	7502207.1	6.09	13C3-PFBS	317540.25	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.11	381436.79	26.031	1953.1	6.09	13C3-PFBS	317540.25	4.660	PFBS	1.118	1.105	✓
PFHxS_1	399.0 / 80.0	7.57	1569543.11	24.198	9394.3	7.55	13C3-PFHxS	278087.54	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.56	601406.59	23.578	1842.5	7.55	13C3-PFHxS	278087.54	4.740	PFHxS	0.383	0.398	✓
PFOS_1	498.9 / 79.9	8.52	491571.60	26.505	1443.4	8.50	13C8-PFOS	137651.99	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.52	117691.68	26.773	440.7	8.50	13C8-PFOS	137651.99	4.790	PFOS	0.239	0.227	✓
NMeFOSAA_1	570.1 / 419.0	8.42	1231728.16	24.727	6661.0	8.41	d3-MeFOSAA	300203.30	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.43	62058.01	23.024	396.1	8.41	d3-MeFOSAA	300203.30	5.000	NMeFOSAA	0.050	0.063	✓
NEtFOSAA_1	584.2 / 419.1	8.59	1109457.99	24.508	4337.8	8.58	d5-EtFOSAA	286033.27	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.59	1279934.46	24.894	13011.7	8.58	d5-EtFOSAA	286033.27	5.000	NEtFOSAA	1.154	1.135	✓
HFPO-DA_1	284.9 / 168.9	6.47	2184353.00	24.929	7978.0	6.46	13C3-HFPO-DA	367082.67	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.47	304345.58	25.215	1481.9	6.46	13C3-HFPO-DA	367082.67	5.000	HFPO-DA	0.139	0.175	✓
ADONA_1	376.9 / 250.9	7.14	22277816.19	24.409	9763.7	7.47	13C8-PFOA	2401677.04	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.14	53279.73	24.827	3210.2	7.47	13C8-PFOA	2401677.04	5.000	ADONA	0.002	0.003	✓
9Cl-PF3ONS_1	530.8 / 351.0	8.81	5344744.03	23.748	6657.0	7.47	13C8-PFOA	2401677.04	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	8.81	1806789.53	23.742	5448.0	7.47	13C8-PFOA	2401677.04	5.000	9Cl-PF3ONS	0.338	0.356	✓
11Cl-PF3OUdS_1	630.9 / 450.9	9.62	15080523.20	25.219	4162.7	7.47	13C8-PFOA	2401677.04	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	9.62	4356048.66	24.305	3495.9	7.47	13C8-PFOA	2401677.04	5.000	11Cl-PF3OUdS	0.289	0.303	✓

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PFAS Calibration Quant Report

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Sample Name	LZ90	**Injection Vial**	10
Sample ID	L8	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:58:19 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.22	17089508.29	51.677	4120.3	6.20	13C5-PFHxA	1304989.81	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.22	386116.49	50.805	3161.5	6.20	13C5-PFHxA	1304989.81	5.000	PFHxA	0.023	0.025	✓
PFHpA_1	363.1 / 319.0	6.94	24282998.38	51.354	3233.6	6.92	13C4-PFHpA	2026312.40	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	6.94	338258.53	51.693	2333.3	6.92	13C4-PFHpA	2026312.40	5.000	PFHpA	0.014	0.015	✓
PFOA_1	413.0 / 369.0	7.50	19307493.89	49.730	3331.3	7.48	13C8-PFOA	1870017.99	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.49	735618.29	50.389	3343.3	7.48	13C8-PFOA	1870017.99	5.000	PFOA	0.038	0.037	✓
PFNA_1	463.0 / 419.0	7.97	13299195.10	53.035	4794.4	7.95	13C9-PFNA	1167273.35	5.000	PFNA			
PFNA_2	463.0 / 219.0	7.97	2106405.32	52.796	11562.1	7.95	13C9-PFNA	1167273.35	5.000	PFNA	0.158	0.167	✓
PFDA_1	512.9 / 469.0	8.40	5787911.57	52.062	3693.4	8.38	13C6-PFDA	994743.99	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.40	145422.04	49.401	46026.6	8.38	13C6-PFDA	994743.99	5.000	PFDA	0.025	0.028	✓
PFUnA_1	563.1 / 519.0	8.81	12487671.57	51.875	3517.1	8.79	13C7-PFUnA	1308275.34	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	8.81	597621.54	51.695	2365.9	8.79	13C7-PFUnA	1308275.34	5.000	PFUnA	0.048	0.051	✓
PFDoA_1	613.1 / 569.0	9.21	8460548.52	50.033	4287.2	9.20	13C2-PFDoA	1642194.23	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.21	1456307.12	49.082	6694.9	9.20	13C2-PFDoA	1642194.23	5.000	PFDoA	0.172	0.187	✓
PFTrDA_1	663.0 / 619.0	9.61	12303545.06	50.667	2641.6	9.96	13C2-PFTeDA	1065555.35	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	9.61	314899.42	48.992	3169.3	9.96	13C2-PFTeDA	1065555.35	5.000	PFTrDA	0.026	0.026	✓
PFTeDA_1	713.0 / 669.0	9.98	9214004.16	50.147	1880.6	9.96	13C2-PFTeDA	1065555.35	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	9.98	178066.84	48.962	2233.1	9.96	13C2-PFTeDA	1065555.35	5.000	PFTeDA	0.019	0.021	✓
PFBS_1	298.7 / 79.9	6.12	511993.83	49.455	14326.0	6.10	13C3-PFBS	248934.66	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.12	565784.98	49.281	3460.6	6.10	13C3-PFBS	248934.66	4.660	PFBS	1.105	1.105	✓
PFHxS_1	399.0 / 80.0	7.57	2536971.76	51.977	7540.1	7.56	13C3-PFHxS	209138.80	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.57	1001666.31	52.189	3432.6	7.56	13C3-PFHxS	209138.80	4.740	PFHxS	0.395	0.398	✓
PFOS_1	498.9 / 79.9	8.52	836619.95	49.120	64447.9	8.51	13C8-PFOS	126443.19	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.52	196156.99	48.566	750.5	8.51	13C8-PFOS	126443.19	4.790	PFOS	0.235	0.227	✓
NMeFOSAA_1	570.1 / 419.0	8.43	2137293.04	49.475	4040.2	8.42	d3-MeFOSAA	260356.75	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.43	120310.50	51.558	476.8	8.42	d3-MeFOSAA	260356.75	5.000	NMeFOSAA	0.056	0.063	✓
NEtFOSAA_1	584.2 / 419.1	8.60	2175674.24	50.514	4449.9	8.58	d5-EtFOSAA	272172.24	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.60	2419615.58	49.462	6944.5	8.58	d5-EtFOSAA	272172.24	5.000	NEtFOSAA	1.112	1.135	✓
HFPO-DA_1	284.9 / 168.9	6.48	3774640.87	50.634	8094.0	6.46	13C3-HFPO-DA	312188.93	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.48	513125.75	50.097	2487.2	6.46	13C3-HFPO-DA	312188.93	5.000	HFPO-DA	0.136	0.175	✓
ADONA_1	376.9 / 250.9	7.15	35794275.96	50.336	16218.8	7.48	13C8-PFOA	1870017.99	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.14	85326.20	51.175	6058.1	7.48	13C8-PFOA	1870017.99	5.000	ADONA	0.002	0.003	✓
9Cl-PF3ONS_1	530.8 / 351.0	8.81	8823248.74	50.357	5032.9	7.48	13C8-PFOA	1870017.99	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	8.81	2942135.40	49.689	3608.7	7.48	13C8-PFOA	1870017.99	5.000	9Cl-PF3ONS	0.334	0.356	✓
11Cl-PF3OUdS_1	630.9 / 450.9	9.63	22951514.25	49.273	3840.9	7.48	13C8-PFOA	1870017.99	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	9.63	7102734.42	50.879	3625.3	7.48	13C8-PFOA	1870017.99	5.000	11Cl-PF3OUdS	0.310	0.303	✓

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PFAS Calibration Quant Report

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Sample Name	LZ83	**Injection Vial**	3
Sample ID	L1	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.20	1852421.12	4.991	6631.1	7.47	13C2-PFOA	2023351.05	5.000				
13C4-PFHpA	367.1 / 322.0	6.92	3069879.64	5.125	6747.9	7.47	13C2-PFOA	2023351.05	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.47	2702551.37	5.197	5121.2	7.47	13C2-PFOA	2023351.05	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.95	1755197.11	4.997	40874.5	7.47	13C2-PFOA	2023351.05	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.38	1481016.35	5.067	4009.2	8.37	13C2-PFDA	1070839.34	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.79	1893097.94	4.822	3564.6	8.37	13C2-PFDA	1070839.34	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.19	2115292.02	4.632	5293.3	8.37	13C2-PFDA	1070839.34	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	9.95	1408770.18	4.881	2607.3	8.37	13C2-PFDA	1070839.34	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.09	427745.94	4.505	3040.2	8.51	13C4-PFOS	80300.45	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.56	313017.91	4.343	32432.6	8.51	13C4-PFOS	80300.45	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.51	161758.18	4.272	7320.9	8.51	13C4-PFOS	80300.45	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.42	302576.08	4.875	2033.2	7.47	13C2-PFOA	2023351.05	5.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.58	304551.17	4.937	5830.5	7.47	13C2-PFOA	2023351.05	5.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.46	397995.73	4.917	144773.3	7.47	13C2-PFOA	2023351.05	5.000		N/A	N/A	✓

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PFAS Calibration Quant Report

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Sample Name	LZ84	**Injection Vial**	4
Sample ID	L2	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:21:58 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.20	2158168.12	5.072	6899.0	7.47	13C2-PFOA	2319965.77	5.000				
13C4-PFHpA	367.1 / 322.0	6.92	3438928.61	5.007	9207.6	7.47	13C2-PFOA	2319965.77	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.48	3030810.49	5.083	31549.0	7.47	13C2-PFOA	2319965.77	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.95	1980254.68	4.917	7818.8	7.47	13C2-PFOA	2319965.77	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.38	1546446.93	4.864	4113.5	8.38	13C2-PFDA	1164963.57	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.79	2133633.23	4.996	3479.6	8.38	13C2-PFDA	1164963.57	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.19	2509643.21	5.052	7919.2	8.38	13C2-PFDA	1164963.57	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	9.95	1490395.92	4.746	2260.3	8.38	13C2-PFDA	1164963.57	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.10	490415.46	4.911	4065.0	8.51	13C4-PFOS	84453.10	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.56	379075.86	5.001	8603.6	8.51	13C4-PFOS	84453.10	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.51	189197.89	4.751	1941.9	8.51	13C4-PFOS	84453.10	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.42	303911.56	4.271	2661.7	7.47	13C2-PFOA	2319965.77	5.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.58	313498.54	4.433	3297.5	7.47	13C2-PFOA	2319965.77	5.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.46	451024.17	4.860	4369.3	7.47	13C2-PFOA	2319965.77	5.000		N/A	N/A	✓

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PFAS Calibration Quant Report

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Sample Name	LZ85	**Injection Vial**	5
Sample ID	L3	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:38:02 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.19	1882876.11	5.066	5942.3	7.47	13C2-PFOA	2026114.10	5.000				
13C4-PFHpA	367.1 / 322.0	6.92	2961797.21	4.938	10816.0	7.47	13C2-PFOA	2026114.10	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.47	2563533.71	4.923	10437.4	7.47	13C2-PFOA	2026114.10	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.94	1792988.78	5.097	7326.8	7.47	13C2-PFOA	2026114.10	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.37	1311031.34	4.842	5783.0	8.37	13C2-PFDA	992095.88	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.79	1913677.56	5.261	3490.3	8.37	13C2-PFDA	992095.88	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.19	2180890.68	5.155	3800.0	8.37	13C2-PFDA	992095.88	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	9.95	1295605.33	4.845	2126.1	8.37	13C2-PFDA	992095.88	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.09	427459.67	4.820	3445.3	8.50	13C4-PFOS	75010.32	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.55	307501.94	4.567	4409.9	8.50	13C4-PFOS	75010.32	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.51	166569.50	4.709	1682.0	8.50	13C4-PFOS	75010.32	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.42	326258.08	5.250	1904.1	7.47	13C2-PFOA	2026114.10	5.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.58	302441.00	4.896	3499.2	7.47	13C2-PFOA	2026114.10	5.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.46	408088.78	5.035	23875.1	7.47	13C2-PFOA	2026114.10	5.000		N/A	N/A	✓

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PFAS Calibration Quant Report

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Sample Name	LZ86	**Injection Vial**	6
Sample ID	L4	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:54:06 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.19	1969346.35	5.313	4264.9	7.46	13C2-PFOA	2020918.88	5.000				
13C4-PFHpA	367.1 / 322.0	6.92	3062641.09	5.119	8219.8	7.46	13C2-PFOA	2020918.88	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.47	2753087.41	5.301	22106.8	7.46	13C2-PFOA	2020918.88	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.94	1896463.70	5.406	8224.9	7.46	13C2-PFOA	2020918.88	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.37	1482150.19	5.162	5699.8	8.37	13C2-PFDA	1052078.09	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.78	1992637.58	5.166	4649.7	8.37	13C2-PFDA	1052078.09	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.19	2327005.15	5.187	4888.1	8.37	13C2-PFDA	1052078.09	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	9.94	1384775.29	4.883	2383.1	8.37	13C2-PFDA	1052078.09	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.09	448451.01	4.810	2281.4	8.50	13C4-PFOS	78843.00	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.55	340240.06	4.808	4110.8	8.50	13C4-PFOS	78843.00	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.50	172966.94	4.653	2752.8	8.50	13C4-PFOS	78843.00	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.41	325236.25	5.247	1538.4	7.46	13C2-PFOA	2020918.88	5.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.58	320065.03	5.195	2448.4	7.46	13C2-PFOA	2020918.88	5.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.46	413758.47	5.118	5641.5	7.46	13C2-PFOA	2020918.88	5.000		N/A	N/A	✓

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PFAS Calibration Quant Report

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Sample Name	LZ87	**Injection Vial**	7
Sample ID	L5	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:10:10 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.19	2100089.22	5.108	5427.9	7.47	13C2-PFOA	2241667.95	5.000				
13C4-PFHpA	367.1 / 322.0	6.92	3564906.96	5.372	6172.4	7.47	13C2-PFOA	2241667.95	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.47	2796067.44	4.853	6997.7	7.47	13C2-PFOA	2241667.95	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.94	2063439.21	5.302	219577.4	7.47	13C2-PFOA	2241667.95	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.37	1510740.95	5.036	1695134.0	8.37	13C2-PFDA	1099034.13	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.79	2120041.80	5.262	4656.1	8.37	13C2-PFDA	1099034.13	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.19	2331474.00	4.975	5635.3	8.37	13C2-PFDA	1099034.13	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	9.95	1492510.72	5.038	2900.1	8.37	13C2-PFDA	1099034.13	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.09	469293.19	4.684	2232.0	8.50	13C4-PFOS	84728.68	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.55	353649.24	4.650	2993.7	8.50	13C4-PFOS	84728.68	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.51	181846.99	4.552	2772.9	8.50	13C4-PFOS	84728.68	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.41	348798.59	5.073	2917.7	7.47	13C2-PFOA	2241667.95	5.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.58	322983.24	4.726	2227.4	7.47	13C2-PFOA	2241667.95	5.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.46	448803.80	5.005	4307.4	7.47	13C2-PFOA	2241667.95	5.000		N/A	N/A	✓

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PFAS Calibration Quant Report

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Sample Name	LZ88	**Injection Vial**	8
Sample ID	L6	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:26:12 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.19	1696610.48	4.878	6299.6	7.47	13C2-PFOA	1896299.30	5.000				
13C4-PFHpA	367.1 / 322.0	6.92	2812269.20	5.009	8389.7	7.47	13C2-PFOA	1896299.30	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.47	2345771.36	4.813	305308.3	7.47	13C2-PFOA	1896299.30	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.94	1599393.00	4.858	7409.4	7.47	13C2-PFOA	1896299.30	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.37	1295166.90	5.053	111751.9	8.37	13C2-PFDA	939182.08	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.78	1655840.16	4.809	4049.2	8.37	13C2-PFDA	939182.08	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.19	1963571.25	4.903	5219.0	8.37	13C2-PFDA	939182.08	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	9.95	1318616.32	5.209	2988.7	8.37	13C2-PFDA	939182.08	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.10	373726.99	4.710	2499.7	8.50	13C4-PFOS	67112.30	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.55	275211.15	4.569	3449.5	8.50	13C4-PFOS	67112.30	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.51	155764.33	4.922	4138.2	8.50	13C4-PFOS	67112.30	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.42	255927.67	4.400	1305.6	7.47	13C2-PFOA	1896299.30	5.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.58	279858.40	4.841	2589.1	7.47	13C2-PFOA	1896299.30	5.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.46	376686.98	4.966	25797.0	7.47	13C2-PFOA	1896299.30	5.000		N/A	N/A	✓

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PFAS Calibration Quant Report

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Sample Name	LZ89	**Injection Vial**	9
Sample ID	L7	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:42:16 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.19	1662252.72	4.739	8447.6	7.46	13C2-PFOA	1912415.79	5.000				
13C4-PFHpA	367.1 / 322.0	6.92	2706701.09	4.781	4605.7	7.46	13C2-PFOA	1912415.79	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.47	2401677.04	4.886	10495.0	7.46	13C2-PFOA	1912415.79	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.94	1611674.55	4.854	6953.9	7.46	13C2-PFOA	1912415.79	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.37	1260732.82	4.889	6470.2	8.37	13C2-PFDA	944778.46	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.78	1628788.39	4.702	3120.9	8.37	13C2-PFDA	944778.46	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.19	1901441.15	4.720	4438.7	8.37	13C2-PFDA	944778.46	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	9.94	1242635.54	4.879	1975.1	8.37	13C2-PFDA	944778.46	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.09	317540.25	4.276	2171.7	8.50	13C4-PFOS	62809.45	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.55	278087.54	4.932	43262.2	8.50	13C4-PFOS	62809.45	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.50	137651.99	4.648	1464.5	8.50	13C4-PFOS	62809.45	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.41	300203.30	5.118	1361.2	7.46	13C2-PFOA	1912415.79	5.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.58	286033.27	4.906	2401.5	7.46	13C2-PFOA	1912415.79	5.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.46	367082.67	4.798	17029.5	7.46	13C2-PFOA	1912415.79	5.000		N/A	N/A	✓

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PFAS Calibration Quant Report

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Sample Name	LZ90	**Injection Vial**	10
Sample ID	L8	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:58:19 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.20	1304989.81	4.834	7296.6	7.47	13C2-PFOA	1471846.80	5.000				
13C4-PFHpA	367.1 / 322.0	6.92	2026312.40	4.650	7299.8	7.47	13C2-PFOA	1471846.80	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.48	1870017.99	4.944	25272.1	7.47	13C2-PFOA	1471846.80	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.95	1167273.35	4.568	9954.8	7.47	13C2-PFOA	1471846.80	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.38	994743.99	5.088	3539.6	8.38	13C2-PFDA	716276.86	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.79	1308275.34	4.982	4253.3	8.38	13C2-PFDA	716276.86	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.20	1642194.23	5.376	4689.1	8.38	13C2-PFDA	716276.86	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	9.96	1065555.35	5.519	2335.5	8.38	13C2-PFDA	716276.86	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.10	248934.66	4.564	3237.6	8.51	13C4-PFOS	46127.98	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.56	209138.80	5.051	7540.8	8.51	13C4-PFOS	46127.98	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.51	126443.19	5.813	1012.9	8.51	13C4-PFOS	46127.98	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.42	260356.75	5.767	1615.4	7.47	13C2-PFOA	1471846.80	5.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.58	272172.24	6.066	2196.6	7.47	13C2-PFOA	1471846.80	5.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.46	312188.93	5.302	5209.1	7.47	13C2-PFOA	1471846.80	5.000		N/A	N/A	✓

Sample Name	LZ92 ICC	**Injection Vial**	12
Sample ID	ICC	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 7:30:28 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/mL)	Target Conc. (ng/mL)	Recovery (%)
PFHxA_1	313.0 / 269.0	6.21	2.435	2.500	97.39
PFHxA_2	313.0 / 118.9	6.21	2.737	2.500	109.48
PFHpA_1	363.1 / 319.0	6.93	2.490	2.500	99.62
PFHpA_2	363.1 / 169.0	6.93	2.318	2.500	92.72
PFOA_1	413.0 / 369.0	7.49	2.627	2.500	105.08
PFOA_2	413.0 / 169.0	7.48	2.660	2.500	106.41
PFNA_1	463.0 / 419.0	7.96	2.314	2.500	92.56
PFNA_2	463.0 / 219.0	7.96	2.313	2.500	92.54
PFDA_1	512.9 / 469.0	8.39	2.510	2.500	100.39
PFDA_2	512.9 / 219.0	8.39	2.195	2.500	87.79
PFUnA_1	563.1 / 519.0	8.80	2.334	2.500	93.37
PFUnA_2	563.1 / 269.1	8.80	2.007	2.500	80.28
PFDoA_1	613.1 / 569.0	9.20	2.674	2.500	106.96
PFDoA_2	613.1 / 319.0	9.20	2.617	2.500	104.69
PFTrDA_1	663.0 / 619.0	9.60	2.652	2.500	106.06
PFTrDA_2	663.0 / 168.9	9.60	3.099	2.500	123.94
PFTeDA_1	713.0 / 669.0	9.97	2.587	2.500	103.47
PFTeDA_2	713.0 / 168.9	9.96	2.680	2.500	107.20
PFBS_1	298.7 / 79.9	6.11	2.616	2.500	104.64
PFBS_2	298.9 / 98.8	6.10	2.728	2.500	109.11
PFHxS_1	399.0 / 80.0	7.57	2.605	2.500	104.18
PFHxS_2	399.0 / 99.0	7.56	2.434	2.500	97.38
PFOS_1	498.9 / 79.9	8.52	2.465	2.500	98.62
PFOS_2	498.9 / 98.9	8.52	3.274	2.500	130.97
NMeFOSAA_1	570.1 / 419.0	8.42	2.657	2.500	106.30
NMeFOSAA_2	570.1 / 483.0	8.43	2.501	2.500	100.05
NEtFOSAA_1	584.2 / 419.1	8.59	3.066	2.500	122.65
NEtFOSAA_2	584.2 / 526.0	8.59	2.877	2.500	115.09
HFPO-DA_1	284.9 / 168.9	6.47	2.691	2.500	107.66
HFPO-DA_2	284.9 / 184.9	6.47	2.601	2.500	104.05
ADONA_1	376.9 / 250.9	7.13	2.641	2.500	105.65
ADONA_2	376.9 / 84.8	7.13	2.727	2.500	109.08
9Cl-PF3ONS_1	530.8 / 351.0	8.80	2.897	2.500	115.87
9Cl-PF3ONS_2	532.8 / 353.0	8.80	2.996	2.500	119.85
11Cl-PF3OUdS_1	630.9 / 450.9	9.62	2.721	2.500	108.82
11Cl-PF3OUdS_2	632.9 / 452.9	9.62	2.680	2.500	107.22

Sample Name	LZ86 CCV	**Injection Vial**	23
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 10:27:16 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/mL)	Target Conc. (ng/mL)	Recovery (%)
PFHxA_1	313.0 / 269.0	6.21	0.988	1.000	98.77
PFHxA_2	313.0 / 118.9	6.21	1.012	1.000	101.23
PFHpA_1	363.1 / 319.0	6.94	0.989	1.000	98.85
PFHpA_2	363.1 / 169.0	6.94	0.727	1.000	72.74
PFOA_1	413.0 / 369.0	7.49	0.967	1.000	96.67
PFOA_2	413.0 / 169.0	7.48	0.922	1.000	92.17
PFNA_1	463.0 / 419.0	7.96	0.992	1.000	99.17
PFNA_2	463.0 / 219.0	7.96	0.911	1.000	91.14
PFDA_1	512.9 / 469.0	8.39	0.927	1.000	92.74
PFDA_2	512.9 / 219.0	8.38	0.698	1.000	69.78
PFUnA_1	563.1 / 519.0	8.80	1.112	1.000	111.23
PFUnA_2	563.1 / 269.1	8.80	1.108	1.000	110.85
PFDoA_1	613.1 / 569.0	9.20	1.018	1.000	101.77
PFDoA_2	613.1 / 319.0	9.20	1.085	1.000	108.52
PFTrDA_1	663.0 / 619.0	9.59	1.046	1.000	104.61
PFTrDA_2	663.0 / 168.9	9.59	1.176	1.000	117.56
PFTeDA_1	713.0 / 669.0	9.96	1.033	1.000	103.34
PFTeDA_2	713.0 / 168.9	9.96	0.851	1.000	85.12
PFBS_1	298.7 / 79.9	6.11	0.983	1.000	98.27
PFBS_2	298.9 / 98.8	6.11	0.963	1.000	96.32
PFHxS_1	399.0 / 80.0	7.57	0.916	1.000	91.60
PFHxS_2	399.0 / 99.0	7.56	0.815	1.000	81.47
PFOS_1	498.9 / 79.9	8.51	1.040	1.000	103.98
PFOS_2	498.9 / 98.9	8.51	0.892	1.000	89.15
NMeFOSAA_1	570.1 / 419.0	8.42	0.968	1.000	96.83
NMeFOSAA_2	570.1 / 483.0	8.43	0.755	1.000	75.53
NEtFOSAA_1	584.2 / 419.1	8.58	0.996	1.000	99.60
NEtFOSAA_2	584.2 / 526.0	8.59	1.008	1.000	100.76
HFPO-DA_1	284.9 / 168.9	6.47	0.983	1.000	98.28
HFPO-DA_2	284.9 / 184.9	6.47	0.855	1.000	85.49
ADONA_1	376.9 / 250.9	7.14	0.950	1.000	94.97
ADONA_2	376.9 / 84.8	7.14	1.347	1.000	134.67
9Cl-PF3ONS_1	530.8 / 351.0	8.80	1.157	1.000	115.74
9Cl-PF3ONS_2	532.8 / 353.0	8.80	1.171	1.000	117.08
11Cl-PF3OUdS_1	630.9 / 450.9	9.62	1.001	1.000	100.11
11Cl-PF3OUdS_2	632.9 / 452.9	9.62	1.083	1.000	108.33

Sample Name	LZ87 CCV	**Injection Vial**	29
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 12:03:44 AM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/mL)	Target Conc. (ng/mL)	Recovery (%)
PFHxA_1	313.0 / 269.0	6.22	2.158	2.500	86.32
PFHxA_2	313.0 / 118.9	6.22	2.617	2.500	104.67
PFHpA_1	363.1 / 319.0	6.94	2.106	2.500	84.25
PFHpA_2	363.1 / 169.0	6.94	1.729	2.500	69.15
PFOA_1	413.0 / 369.0	7.49	2.409	2.500	96.35
PFOA_2	413.0 / 169.0	7.49	2.325	2.500	93.00
PFNA_1	463.0 / 419.0	7.97	2.205	2.500	88.19
PFNA_2	463.0 / 219.0	7.97	2.310	2.500	92.40
PFDA_1	512.9 / 469.0	8.39	2.307	2.500	92.27
PFDA_2	512.9 / 219.0	8.39	2.441	2.500	97.65
PFUnA_1	563.1 / 519.0	8.80	2.107	2.500	84.26
PFUnA_2	563.1 / 269.1	8.80	1.992	2.500	79.67
PFDoA_1	613.1 / 569.0	9.20	2.355	2.500	94.21
PFDoA_2	613.1 / 319.0	9.20	2.322	2.500	92.88
PFTrDA_1	663.0 / 619.0	9.60	2.388	2.500	95.50
PFTrDA_2	663.0 / 168.9	9.60	2.419	2.500	96.78
PFTeDA_1	713.0 / 669.0	9.96	2.215	2.500	88.60
PFTeDA_2	713.0 / 168.9	9.96	2.092	2.500	83.70
PFBS_1	298.7 / 79.9	6.11	2.486	2.500	99.44
PFBS_2	298.9 / 98.8	6.11	2.407	2.500	96.30
PFHxS_1	399.0 / 80.0	7.57	2.254	2.500	90.15
PFHxS_2	399.0 / 99.0	7.57	2.280	2.500	91.19
PFOS_1	498.9 / 79.9	8.52	2.255	2.500	90.20
PFOS_2	498.9 / 98.9	8.52	2.292	2.500	91.67
NMeFOSAA_1	570.1 / 419.0	8.43	2.332	2.500	93.29
NMeFOSAA_2	570.1 / 483.0	8.41	2.586	2.500	103.45
NEtFOSAA_1	584.2 / 419.1	8.59	2.671	2.500	106.83
NEtFOSAA_2	584.2 / 526.0	8.59	2.500	2.500	100.01
HFPO-DA_1	284.9 / 168.9	6.47	2.290	2.500	91.60
HFPO-DA_2	284.9 / 184.9	6.48	2.437	2.500	97.48
ADONA_1	376.9 / 250.9	7.14	2.745	2.500	109.80
ADONA_2	376.9 / 84.8	7.14	2.267	2.500	90.70
9Cl-PF3ONS_1	530.8 / 351.0	8.81	3.026	2.500	121.05
9Cl-PF3ONS_2	532.8 / 353.0	8.81	3.060	2.500	122.42
11Cl-PF3OUdS_1	630.9 / 450.9	9.62	2.548	2.500	101.93
11Cl-PF3OUdS_2	632.9 / 452.9	9.62	2.781	2.500	111.24

Sample Name	LZ92 ICC	**Injection Vial**	12
Sample ID	ICC	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 7:30:28 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/mL)	Target Conc. (ng/mL)	Recovery (%)
13C5-PFHxA	318.0 / 273.0	6.19	4.668	5.000	93.35
13C4-PFHpA	367.1 / 322.0	6.92	4.817	5.000	96.35
13C8-PFOA	421.1 / 376.0	7.47	4.569	5.000	91.37
13C9-PFNA	472.1 / 427.0	7.94	4.996	5.000	99.92
13C6-PFDA	519.1 / 474.1	8.37	5.192	5.000	103.84
13C7-PFUnA	570.0 / 525.1	8.78	5.297	5.000	105.94
13C2-PFDoA	615.1 / 570.0	9.19	5.248	5.000	104.97
13C2-PFTeDA	715.2 / 670.0	9.95	5.007	5.000	100.14
13C3-PFBS	302.1 / 79.9	6.09	4.914	4.660	105.44
13C3-PFHxS	402.1 / 79.9	7.55	4.737	4.740	99.93
13C8-PFOS	507.1 / 79.9	8.50	4.764	4.790	99.46
d3-MeFOSAA	573.2 / 419.0	8.41	4.769	5.000	95.37
d5-EtFOSAA	589.2 / 419.0	8.58	4.415	5.000	88.30
13C3-HFPO-DA	286.9 / 168.9	6.45	4.406	5.000	88.12

Sample Name	LZ86 CCV	**Injection Vial**	23
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 10:27:16 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/mL)	Target Conc. (ng/mL)	Recovery (%)
13C5-PFHxA	318.0 / 273.0	6.19	5.319	5.000	106.38
13C4-PFHpA	367.1 / 322.0	6.92	5.408	5.000	108.15
13C8-PFOA	421.1 / 376.0	7.47	5.328	5.000	106.55
13C9-PFNA	472.1 / 427.0	7.94	5.531	5.000	110.61
13C6-PFDA	519.1 / 474.1	8.37	4.803	5.000	96.07
13C7-PFUnA	570.0 / 525.1	8.78	4.540	5.000	90.80
13C2-PFDoA	615.1 / 570.0	9.18	4.568	5.000	91.36
13C2-PFTeDA	715.2 / 670.0	9.94	4.537	5.000	90.74
13C3-PFBS	302.1 / 79.9	6.09	4.838	4.660	103.82
13C3-PFHxS	402.1 / 79.9	7.55	4.834	4.740	101.99
13C8-PFOS	507.1 / 79.9	8.50	4.482	4.790	93.58
d3-MeFOSAA	573.2 / 419.0	8.41	5.915	5.000	118.31
d5-EtFOSAA	589.2 / 419.0	8.57	5.293	5.000	105.85
13C3-HFPO-DA	286.9 / 168.9	6.46	5.017	5.000	100.34

Sample Name	LZ87 CCV	**Injection Vial**	29
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 12:03:44 AM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/mL)	Target Conc. (ng/mL)	Recovery (%)
13C5-PFHxA	318.0 / 273.0	6.20	6.030	5.000	120.59
13C4-PFHpA	367.1 / 322.0	6.93	6.239	5.000	124.78
13C8-PFOA	421.1 / 376.0	7.47	4.880	5.000	97.60
13C9-PFNA	472.1 / 427.0	7.95	5.011	5.000	100.22
13C6-PFDA	519.1 / 474.1	8.38	4.925	5.000	98.50
13C7-PFUnA	570.0 / 525.1	8.78	5.174	5.000	103.49
13C2-PFDoA	615.1 / 570.0	9.19	4.838	5.000	96.77
13C2-PFTeDA	715.2 / 670.0	9.94	4.401	5.000	88.01
13C3-PFBS	302.1 / 79.9	6.10	4.873	4.660	104.57
13C3-PFHxS	402.1 / 79.9	7.56	4.450	4.740	93.88
13C8-PFOS	507.1 / 79.9	8.50	4.811	4.790	100.44
d3-MeFOSAA	573.2 / 419.0	8.42	6.353	5.000	127.06
d5-EtFOSAA	589.2 / 419.0	8.58	5.563	5.000	111.26
13C3-HFPO-DA	286.9 / 168.9	6.46	5.352	5.000	107.04

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PFAS QC Sample Quant Report

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Sample Name	LZ92 ICC	**Injection Vial**	12
Sample ID	ICC	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 7:30:28 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.21	1019610.65	2.435	887.0	6.19	13C5-PFHxA	1681011.65	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.21	26670.47	2.737	473.4	6.19	13C5-PFHxA	1681011.65	5.000	PFHxA	0.026	0.025	✓
PFHpA_1	363.1 / 319.0	6.93	1609000.04	2.490	1079.7	6.92	13C4-PFHpA	2800336.69	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	6.93	21019.86	2.318	100331.6	6.92	13C4-PFHpA	2800336.69	5.000	PFHpA	0.013	0.015	✓
PFOA_1	413.0 / 369.0	7.49	1249512.67	2.627	1425.5	7.47	13C8-PFOA	2305495.25	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.48	47370.85	2.660	702.8	7.47	13C8-PFOA	2305495.25	5.000	PFOA	0.038	0.037	✓
PFNA_1	463.0 / 419.0	7.96	817269.20	2.314	884.7	7.94	13C9-PFNA	1702939.94	5.000	PFNA			
PFNA_2	463.0 / 219.0	7.96	132290.28	2.313	636840.5	7.94	13C9-PFNA	1702939.94	5.000	PFNA	0.162	0.167	✓
PFDA_1	512.9 / 469.0	8.39	353744.61	2.510	819.0	8.37	13C6-PFDA	1272273.53	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.39	8237.69	2.195	69280.5	8.37	13C6-PFDA	1272273.53	5.000	PFDA	0.023	0.028	✓
PFUnA_1	563.1 / 519.0	8.80	738722.80	2.334	1189.0	8.78	13C7-PFUnA	1743530.25	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	8.80	30908.79	2.007	391.4	8.78	13C7-PFUnA	1743530.25	5.000	PFUnA	0.042	0.051	✓
PFDoA_1	613.1 / 569.0	9.20	548622.52	2.674	1007.6	9.19	13C2-PFDoA	2009340.79	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.20	95055.29	2.617	117310.8	9.19	13C2-PFDoA	2009340.79	5.000	PFDoA	0.173	0.187	✓
PFTrDA_1	663.0 / 619.0	9.60	731023.77	2.652	1162.2	9.95	13C2-PFTeDA	1211719.69	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	9.60	22495.65	3.099	3284018.6	9.95	13C2-PFTeDA	1211719.69	5.000	PFTrDA	0.031	0.026	✓
PFTeDA_1	713.0 / 669.0	9.97	543035.76	2.587	1218.2	9.95	13C2-PFTeDA	1211719.69	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	9.96	11309.71	2.680	4059.8	9.95	13C2-PFTeDA	1211719.69	5.000	PFTeDA	0.021	0.021	✓
PFBS_1	298.7 / 79.9	6.11	42197.82	2.616	4019.4	6.09	13C3-PFBS	383190.09	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.10	48744.03	2.728	1426.8	6.09	13C3-PFBS	383190.09	4.660	PFBS	1.155	1.105	✓
PFHxS_1	399.0 / 80.0	7.57	168784.66	2.605	2868.1	7.55	13C3-PFHxS	280419.91	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.56	62091.42	2.434	1185.2	7.55	13C3-PFHxS	280419.91	4.740	PFHxS	0.368	0.398	✓
PFOS_1	498.9 / 79.9	8.52	49469.83	2.465	276.7	8.50	13C8-PFOS	148166.11	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.52	15427.53	3.274	349.0	8.50	13C8-PFOS	148166.11	4.790	PFOS	0.312	0.227	✓
NMeFOSAA_1	570.1 / 419.0	8.42	126709.72	2.657	6646.6	8.41	d3-MeFOSAA	287199.71	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.43	6616.75	2.501	245.6	8.41	d3-MeFOSAA	287199.71	5.000	NMeFOSAA	0.052	0.063	✓
NEtFOSAA_1	584.2 / 419.1	8.59	128418.98	3.066	15441.8	8.58	d5-EtFOSAA	264266.32	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.59	136837.26	2.877	5084.6	8.58	d5-EtFOSAA	264266.32	5.000	NEtFOSAA	1.066	1.135	✓
HFPO-DA_1	284.9 / 168.9	6.47	221000.26	2.691	2932.6	6.45	13C3-HFPO-DA	346097.51	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.47	30727.61	2.601	437.3	6.45	13C3-HFPO-DA	346097.51	5.000	HFPO-DA	0.139	0.175	✓
ADONA_1	376.9 / 250.9	7.13	2289676.30	2.641	25775.2	7.47	13C8-PFOA	2305495.25	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.13	5810.67	2.727	51070.5	7.47	13C8-PFOA	2305495.25	5.000	ADONA	0.003	0.003	✓
9Cl-PF3ONS_1	530.8 / 351.0	8.80	627154.93	2.897	3152.6	7.47	13C8-PFOA	2305495.25	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	8.80	221048.58	2.996	29951.6	7.47	13C8-PFOA	2305495.25	5.000	9Cl-PF3ONS	0.353	0.356	✓
11Cl-PF3OUdS_1	630.9 / 450.9	9.62	1550972.32	2.721	2501.7	7.47	13C8-PFOA	2305495.25	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	9.62	458651.72	2.680	3303.9	7.47	13C8-PFOA	2305495.25	5.000	11Cl-PF3OUdS	0.296	0.303	✓

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PFAS QC Sample Quant Report

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Sample Name	LZ86 CCV	**Injection Vial**	23
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 10:27:16 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.21	441500.06	0.988	732.9	6.19	13C5-PFHxA	1843126.83	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.21	10724.51	1.012	340.9	6.19	13C5-PFHxA	1843126.83	5.000	PFHxA	0.024	0.025	✓
PFHpA_1	363.1 / 319.0	6.94	677201.27	0.989	905.8	6.92	13C4-PFHpA	3024531.39	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	6.94	7168.75	0.727	421.7	6.92	13C4-PFHpA	3024531.39	5.000	PFHpA	0.011	0.015	✓
PFOA_1	413.0 / 369.0	7.49	510036.20	0.967	944.8	7.47	13C8-PFOA	2586749.50	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.48	18019.18	0.922	637.3	7.47	13C8-PFOA	2586749.50	5.000	PFOA	0.035	0.037	✓
PFNA_1	463.0 / 419.0	7.96	354394.29	0.992	639.5	7.94	13C9-PFNA	1813868.17	5.000	PFNA			
PFNA_2	463.0 / 219.0	7.96	53909.95	0.911	1477.5	7.94	13C9-PFNA	1813868.17	5.000	PFNA	0.152	0.167	✓
PFDA_1	512.9 / 469.0	8.39	144748.50	0.927	507.9	8.37	13C6-PFDA	1431623.82	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.38	2926.48	0.698	1738.2	8.37	13C6-PFDA	1431623.82	5.000	PFDA	0.020	0.028	✓
PFUnA_1	563.1 / 519.0	8.80	361161.09	1.112	875.7	8.78	13C7-PFUnA	1817508.59	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	8.80	17789.14	1.108	6856.4	8.78	13C7-PFUnA	1817508.59	5.000	PFUnA	0.049	0.051	✓
PFDoA_1	613.1 / 569.0	9.20	217807.76	1.018	763.8	9.18	13C2-PFDoA	2127154.44	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.20	41752.38	1.085	3371.7	9.18	13C2-PFDoA	2127154.44	5.000	PFDoA	0.192	0.187	✓
PFTrDA_1	663.0 / 619.0	9.59	317004.11	1.046	785.7	9.94	13C2-PFTeDA	1335415.09	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	9.59	9294.64	1.176	1379.3	9.94	13C2-PFTeDA	1335415.09	5.000	PFTrDA	0.029	0.026	✓
PFTeDA_1	713.0 / 669.0	9.96	240828.38	1.033	816.4	9.94	13C2-PFTeDA	1335415.09	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	9.96	4138.44	0.851	497.5	9.94	13C2-PFTeDA	1335415.09	5.000	PFTeDA	0.017	0.021	✓
PFBS_1	298.7 / 79.9	6.11	18063.56	0.983	1573.1	6.09	13C3-PFBS	427668.48	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.11	19620.11	0.963	484.3	6.09	13C3-PFBS	427668.48	4.660	PFBS	1.086	1.105	✓
PFHxS_1	399.0 / 80.0	7.57	67350.41	0.916	680.0	7.55	13C3-PFHxS	324395.34	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.56	23585.73	0.815	429.2	7.55	13C3-PFHxS	324395.34	4.740	PFHxS	0.350	0.398	✓
PFOS_1	498.9 / 79.9	8.51	22419.41	1.040	1268444.7	8.50	13C8-PFOS	158007.88	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.51	4422.23	0.892	766.0	8.50	13C8-PFOS	158007.88	4.790	PFOS	0.197	0.227	✓
NMeFOSAA_1	570.1 / 419.0	8.42	55160.47	0.968	171925.8	8.41	d3-MeFOSAA	342786.71	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.43	2540.67	0.755	233589.5	8.41	d3-MeFOSAA	342786.71	5.000	NMeFOSAA	0.046	0.063	✓
NEtFOSAA_1	584.2 / 419.1	8.58	48270.56	0.996	743.3	8.57	d5-EtFOSAA	304828.06	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.59	55412.83	1.008	400.3	8.57	d5-EtFOSAA	304828.06	5.000	NEtFOSAA	1.148	1.135	✓
HFPO-DA_1	284.9 / 168.9	6.47	87366.89	0.983	3401.3	6.46	13C3-HFPO-DA	379168.31	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.47	11988.09	0.855	221.6	6.46	13C3-HFPO-DA	379168.31	5.000	HFPO-DA	0.137	0.175	✓
ADONA_1	376.9 / 250.9	7.14	903991.00	0.950	23379.0	7.47	13C8-PFOA	2586749.50	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.14	3342.30	1.347	1636.0	7.47	13C8-PFOA	2586749.50	5.000	ADONA	0.004	0.003	✓
9Cl-PF3ONS_1	530.8 / 351.0	8.80	282168.47	1.157	2764197.4	7.47	13C8-PFOA	2586749.50	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	8.80	98603.62	1.171	4658.1	7.47	13C8-PFOA	2586749.50	5.000	9Cl-PF3ONS	0.349	0.356	✓
11Cl-PF3OUdS_1	630.9 / 450.9	9.62	631756.43	1.001	2970.7	7.47	13C8-PFOA	2586749.50	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	9.62	206081.83	1.083	2207.8	7.47	13C8-PFOA	2586749.50	5.000	11Cl-PF3OUdS	0.326	0.303	✓

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PFAS QC Sample Quant Report

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Sample Name	LZ87 CCV	**Injection Vial**	29
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 12:03:44 AM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.22	1062732.37	2.158	1536.4	6.20	13C5-PFHxA	1981462.65	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.22	30049.01	2.617	724.8	6.20	13C5-PFHxA	1981462.65	5.000	PFHxA	0.028	0.025	✓
PFHpA_1	363.1 / 319.0	6.94	1604538.85	2.106	637.2	6.93	13C4-PFHpA	3309292.04	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	6.94	18542.18	1.729	1683.1	6.93	13C4-PFHpA	3309292.04	5.000	PFHpA	0.012	0.015	✓
PFOA_1	413.0 / 369.0	7.49	1115956.51	2.409	1100.0	7.47	13C8-PFOA	2247019.73	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.49	40285.62	2.325	1073.1	7.47	13C8-PFOA	2247019.73	5.000	PFOA	0.036	0.037	✓
PFNA_1	463.0 / 419.0	7.97	711334.16	2.205	832.0	7.95	13C9-PFNA	1558529.54	5.000	PFNA			
PFNA_2	463.0 / 219.0	7.97	120887.49	2.310	7647.2	7.95	13C9-PFNA	1558529.54	5.000	PFNA	0.170	0.167	✓
PFDA_1	512.9 / 469.0	8.39	371265.98	2.307	1054.6	8.38	13C6-PFDA	1453979.22	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.39	10474.95	2.441	10909.9	8.38	13C6-PFDA	1453979.22	5.000	PFDA	0.028	0.028	✓
PFUnA_1	563.1 / 519.0	8.80	783378.78	2.107	1164.4	8.78	13C7-PFUnA	2051906.28	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	8.80	36097.10	1.992	906.2	8.78	13C7-PFUnA	2051906.28	5.000	PFUnA	0.046	0.051	✓
PFDoA_1	613.1 / 569.0	9.20	536025.44	2.355	949.0	9.19	13C2-PFDoA	2231619.66	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.20	93663.58	2.322	1832.1	9.19	13C2-PFDoA	2231619.66	5.000	PFDoA	0.175	0.187	✓
PFTrDA_1	663.0 / 619.0	9.60	696832.04	2.388	1272.2	9.94	13C2-PFTeDA	1283023.64	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	9.60	18561.55	2.419	59618.5	9.94	13C2-PFTeDA	1283023.64	5.000	PFTrDA	0.027	0.026	✓
PFTeDA_1	713.0 / 669.0	9.96	492750.26	2.215	1719.6	9.94	13C2-PFTeDA	1283023.64	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	9.96	9405.32	2.092	3690.9	9.94	13C2-PFTeDA	1283023.64	5.000	PFTeDA	0.019	0.021	✓
PFBS_1	298.7 / 79.9	6.11	45604.75	2.486	11995.3	6.10	13C3-PFBS	435503.10	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.11	48968.17	2.407	795.6	6.10	13C3-PFBS	435503.10	4.660	PFBS	1.074	1.105	✓
PFHxS_1	399.0 / 80.0	7.57	156981.32	2.254	262522.9	7.56	13C3-PFHxS	301895.52	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.57	62555.34	2.280	1141.6	7.56	13C3-PFHxS	301895.52	4.740	PFHxS	0.399	0.398	✓
PFOS_1	498.9 / 79.9	8.52	52392.00	2.255	2980983.7	8.50	13C8-PFOS	171466.85	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.52	12470.00	2.292	455.0	8.50	13C8-PFOS	171466.85	4.790	PFOS	0.238	0.227	✓
NMeFOSAA_1	570.1 / 419.0	8.43	135189.55	2.332	6909807.7	8.42	d3-MeFOSAA	349125.84	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.41	8308.60	2.586	579.4	8.42	d3-MeFOSAA	349125.84	5.000	NMeFOSAA	0.062	0.063	✓
NEtFOSAA_1	584.2 / 419.1	8.59	128639.87	2.671	270447.8	8.58	d5-EtFOSAA	303842.37	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.59	136750.34	2.500	288121.0	8.58	d5-EtFOSAA	303842.37	5.000	NEtFOSAA	1.063	1.135	✓
HFPO-DA_1	284.9 / 168.9	6.47	208146.11	2.290	2856.9	6.46	13C3-HFPO-DA	383566.14	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.48	31993.04	2.437	493.8	6.46	13C3-HFPO-DA	383566.14	5.000	HFPO-DA	0.154	0.175	✓
ADONA_1	376.9 / 250.9	7.14	2320168.25	2.745	133187.8	7.47	13C8-PFOA	2247019.73	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.14	4744.20	2.267	315.3	7.47	13C8-PFOA	2247019.73	5.000	ADONA	0.002	0.003	✓
9Cl-PF3ONS_1	530.8 / 351.0	8.81	638541.57	3.026	8056.9	7.47	13C8-PFOA	2247019.73	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	8.81	220011.39	3.060	7889.9	7.47	13C8-PFOA	2247019.73	5.000	9Cl-PF3ONS	0.345	0.356	✓
11Cl-PF3OUdS_1	630.9 / 450.9	9.62	1415095.40	2.548	2452.9	7.47	13C8-PFOA	2247019.73	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	9.62	463915.29	2.781	3447.5	7.47	13C8-PFOA	2247019.73	5.000	11Cl-PF3OUdS	0.328	0.303	✓

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PFAS QC Sample Quant Report

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Sample Name	LZ92 ICC	**Injection Vial**	12
Sample ID	ICC	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 7:30:28 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.19	1681011.65	4.668	5876.1	7.46	13C2-PFOA	1963494.82	5.000				
13C4-PFHpA	367.1 / 322.0	6.92	2800336.69	4.817	7486.7	7.46	13C2-PFOA	1963494.82	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.47	2305495.25	4.569	33328.6	7.46	13C2-PFOA	1963494.82	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.94	1702939.94	4.996	4744.4	7.46	13C2-PFOA	1963494.82	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.37	1272273.53	5.192	4371.5	8.37	13C2-PFDA	897794.24	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.78	1743530.25	5.297	4219.4	8.37	13C2-PFDA	897794.24	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.19	2009340.79	5.248	5887.4	8.37	13C2-PFDA	897794.24	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	9.95	1211719.69	5.007	2277.4	8.37	13C2-PFDA	897794.24	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.09	383190.09	4.914	2612.9	8.50	13C4-PFOS	65954.30	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.55	280419.91	4.737	5393.3	8.50	13C4-PFOS	65954.30	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.50	148166.11	4.764	10219.6	8.50	13C4-PFOS	65954.30	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.41	287199.71	4.769	2482.5	7.46	13C2-PFOA	1963494.82	5.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.58	264266.32	4.415	2255.8	7.46	13C2-PFOA	1963494.82	5.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.45	346097.51	4.406	5476.4	7.46	13C2-PFOA	1963494.82	5.000		N/A	N/A	✓

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PFAS QC Sample Quant Report

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Sample Name	LZ86 CCV	**Injection Vial**	23
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 10:27:16 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.19	1843126.83	5.319	6589.8	7.46	13C2-PFOA	1889197.75	5.000				
13C4-PFHpA	367.1 / 322.0	6.92	3024531.39	5.408	8099.7	7.46	13C2-PFOA	1889197.75	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.47	2586749.50	5.328	12320.3	7.46	13C2-PFOA	1889197.75	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.94	1813868.17	5.531	35412.9	7.46	13C2-PFOA	1889197.75	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.37	1431623.82	4.803	3948.9	8.36	13C2-PFDA	1091955.25	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.78	1817508.59	4.540	3193.7	8.36	13C2-PFDA	1091955.25	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.18	2127154.44	4.568	3071.8	8.36	13C2-PFDA	1091955.25	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	9.94	1335415.09	4.537	2737.8	8.36	13C2-PFDA	1091955.25	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.09	427668.48	4.838	2675.7	8.50	13C4-PFOS	74759.26	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.55	324395.34	4.834	14326.4	8.50	13C4-PFOS	74759.26	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.50	158007.88	4.482	3435.1	8.50	13C4-PFOS	74759.26	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.41	342786.71	5.915	1277.4	7.46	13C2-PFOA	1889197.75	5.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.57	304828.06	5.293	3175.9	7.46	13C2-PFOA	1889197.75	5.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.46	379168.31	5.017	25524216.4	7.46	13C2-PFOA	1889197.75	5.000		N/A	N/A	✓

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PFAS QC Sample Quant Report

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Sample Name	LZ87 CCV	**Injection Vial**	29
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 12:03:44 AM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.20	1981462.65	6.030	6884.2	7.47	13C2-PFOA	1791587.40	5.000				
13C4-PFHpA	367.1 / 322.0	6.93	3309292.04	6.239	6619.8	7.47	13C2-PFOA	1791587.40	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.47	2247019.73	4.880	18558.2	7.47	13C2-PFOA	1791587.40	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.95	1558529.54	5.011	7241.1	7.47	13C2-PFOA	1791587.40	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.38	1453979.22	4.925	8040.3	8.37	13C2-PFDA	1081631.81	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.78	2051906.28	5.174	4878.3	8.37	13C2-PFDA	1081631.81	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.19	2231619.66	4.838	3406.9	8.37	13C2-PFDA	1081631.81	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	9.94	1283023.64	4.401	2836.2	8.37	13C2-PFDA	1081631.81	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.10	435503.10	4.873	3032.6	8.50	13C4-PFOS	75582.33	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.56	301895.52	4.450	4934.3	8.50	13C4-PFOS	75582.33	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.50	171466.85	4.811	3189.5	8.50	13C4-PFOS	75582.33	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.42	349125.84	6.353	2115.8	7.47	13C2-PFOA	1791587.40	5.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.58	303842.37	5.563	3785.9	7.47	13C2-PFOA	1791587.40	5.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.46	383566.14	5.352	1421.4	7.47	13C2-PFOA	1791587.40	5.000		N/A	N/A	✓

Raw Analytical Data

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PFAS Sample Quant Report

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Printed: 23/08/2023 10:32:39 AM

Sample Name	LZ91 IB	**Injection Vial**	11
Sample ID	Instrument Blank	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 7:14:23 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	N/A	N/A	N/A	N/A	6.20	13C5-PFHxA	1778070.60	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	N/A	N/A	N/A	N/A	6.20	13C5-PFHxA	1778070.60	5.000	PFHxA	N/A	0.025	✓
PFHpA_1	363.1 / 319.0	N/A	N/A	N/A	N/A	6.93	13C4-PFHpA	2848321.12	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	N/A	N/A	N/A	N/A	6.93	13C4-PFHpA	2848321.12	5.000	PFHpA	N/A	0.015	✓
PFOA_1	413.0 / 369.0	7.50	4841.58	0.027	16.5	7.48	13C8-PFOA	2473652.05	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.48	186.69	0.040	157.1	7.48	13C8-PFOA	2473652.05	5.000	PFOA	0.039	0.037	✓
PFNA_1	463.0 / 419.0	N/A	N/A	N/A	N/A	7.95	13C9-PFNA	1666418.49	5.000	PFNA			
PFNA_2	463.0 / 219.0	N/A	N/A	N/A	N/A	7.95	13C9-PFNA	1666418.49	5.000	PFNA	N/A	0.167	✓
PFDA_1	512.9 / 469.0	N/A	N/A	N/A	N/A	8.38	13C6-PFDA	1303497.57	5.000	PFDA			
PFDA_2	512.9 / 219.0	N/A	N/A	N/A	N/A	8.38	13C6-PFDA	1303497.57	5.000	PFDA	N/A	0.028	✓
PFUnA_1	563.1 / 519.0	8.82	4067.44	0.045	14.9	8.79	13C7-PFUnA	1810377.62	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	8.81	183.77	0.012	385325.7	8.79	13C7-PFUnA	1810377.62	5.000	PFUnA	0.045	0.051	✓
PFDoA_1	613.1 / 569.0	9.23	2345.51	0.035	13.3	9.20	13C2-PFDoA	2023352.98	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.23	433.53	0.011	154.5	9.20	13C2-PFDoA	2023352.98	5.000	PFDoA	0.185	0.187	✓
PFTrDA_1	663.0 / 619.0	9.59	4715.45	0.021	32.2	9.95	13C2-PFTeDA	1244591.58	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	9.50	68.46	0.031	107.5	9.95	13C2-PFTeDA	1244591.58	5.000	PFTrDA	0.015	0.026	✓
PFTeDA_1	713.0 / 669.0	9.98	5569.10	0.013	50.9	9.95	13C2-PFTeDA	1244591.58	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	9.82	133.81	< 0	1928.4	9.95	13C2-PFTeDA	1244591.58	5.000	PFTeDA	0.024	0.021	✓
PFBS_1	298.7 / 79.9	N/A	N/A	N/A	N/A	6.10	13C3-PFBS	402512.45	4.660	PFBS			
PFBS_2	298.9 / 98.8	N/A	N/A	N/A	N/A	6.10	13C3-PFBS	402512.45	4.660	PFBS	N/A	1.105	✓
PFHxS_1	399.0 / 80.0	N/A	N/A	N/A	N/A	7.56	13C3-PFHxS	300460.59	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	N/A	N/A	N/A	N/A	7.56	13C3-PFHxS	300460.59	4.740	PFHxS	N/A	0.398	✓
PFOS_1	498.9 / 79.9	N/A	N/A	N/A	N/A	8.51	13C8-PFOS	157000.95	4.790	PFOS			
PFOS_2	498.9 / 98.9	N/A	N/A	N/A	N/A	8.51	13C8-PFOS	157000.95	4.790	PFOS	N/A	0.227	✓
NMeFOSAA_1	570.1 / 419.0	N/A	N/A	N/A	N/A	8.42	d3-MeFOSAA	323760.80	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	N/A	N/A	N/A	N/A	8.42	d3-MeFOSAA	323760.80	5.000	NMeFOSAA	N/A	0.063	✓
NEtFOSAA_1	584.2 / 419.1	N/A	N/A	N/A	N/A	8.59	d5-EtFOSAA	298488.37	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	N/A	N/A	N/A	N/A	8.59	d5-EtFOSAA	298488.37	5.000	NEtFOSAA	N/A	1.135	✓
HFPO-DA_1	284.9 / 168.9	N/A	N/A	N/A	N/A	6.46	13C3-HFPO-DA	368923.25	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	N/A	N/A	N/A	N/A	6.46	13C3-HFPO-DA	368923.25	5.000	HFPO-DA	N/A	0.175	✓
ADONA_1	376.9 / 250.9	7.15	1581.90	0.033	11904.0	7.48	13C8-PFOA	2473652.05	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.13	76.53	< 0	69029.5	7.48	13C8-PFOA	2473652.05	5.000	ADONA	0.048	0.003	
9Cl-PF3ONS_1	530.8 / 351.0	8.82	807.13	< 0	31.1	7.48	13C8-PFOA	2473652.05	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	N/A	N/A	N/A	N/A	7.48	13C8-PFOA	2473652.05	5.000	9Cl-PF3ONS	N/A	0.356	
11Cl-PF3OUdS_1	630.9 / 450.9	9.63	4420.35	0.028	60.4	7.48	13C8-PFOA	2473652.05	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	9.63	705.06	0.020	18.8	7.48	13C8-PFOA	2473652.05	5.000	11Cl-PF3OUdS	0.160	0.303	✓

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PFAS Sample Quant Report

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Printed: 23/08/2023 10:32:39 AM

Sample Name	DO701PB-FS(0)	**Injection Vial**	24
Sample ID	Procedural Blank	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 10:43:21 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	N/A	N/A	N/A	N/A	6.20	13C5-PFHxA	1840154.77	25.000	PFHxA			
PFHxA_2	313.0 / 118.9	N/A	N/A	N/A	N/A	6.20	13C5-PFHxA	1840154.77	25.000	PFHxA	N/A	0.025	✓
PFHpA_1	363.1 / 319.0	6.94	4582.00	0.180	11.9	6.92	13C4-PFHpA	3082009.16	25.000	PFHpA			
PFHpA_2	363.1 / 169.0	N/A	N/A	N/A	N/A	6.92	13C4-PFHpA	3082009.16	25.000	PFHpA	N/A	0.015	
PFOA_1	413.0 / 369.0	7.50	4949.44	0.132	20.9	7.47	13C8-PFOA	2631752.78	25.000	PFOA			
PFOA_2	413.0 / 169.0	N/A	N/A	N/A	N/A	7.47	13C8-PFOA	2631752.78	25.000	PFOA	N/A	0.037	
PFNA_1	463.0 / 419.0	N/A	N/A	N/A	N/A	7.94	13C9-PFNA	1806254.92	25.000	PFNA			
PFNA_2	463.0 / 219.0	N/A	N/A	N/A	N/A	7.94	13C9-PFNA	1806254.92	25.000	PFNA	N/A	0.167	✓
PFDA_1	512.9 / 469.0	N/A	N/A	N/A	N/A	8.37	13C6-PFDA	1361320.24	25.000	PFDA			
PFDA_2	512.9 / 219.0	N/A	N/A	N/A	N/A	8.37	13C6-PFDA	1361320.24	25.000	PFDA	N/A	0.028	✓
PFUnA_1	563.1 / 519.0	N/A	N/A	N/A	N/A	8.79	13C7-PFUnA	1854698.86	25.000	PFUnA			
PFUnA_2	563.1 / 269.1	N/A	N/A	N/A	N/A	8.79	13C7-PFUnA	1854698.86	25.000	PFUnA	N/A	0.051	✓
PFDoA_1	613.1 / 569.0	N/A	N/A	N/A	N/A	9.19	13C2-PFDoA	2058880.31	25.000	PFDoA			
PFDoA_2	613.1 / 319.0	N/A	N/A	N/A	N/A	9.19	13C2-PFDoA	2058880.31	25.000	PFDoA	N/A	0.187	✓
PFTrDA_1	663.0 / 619.0	9.57	1670.01	0.052	10.2	9.95	13C2-PFTeDA	1252489.58	25.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	N/A	N/A	N/A	N/A	9.95	13C2-PFTeDA	1252489.58	25.000	PFTrDA	N/A	0.026	
PFTeDA_1	713.0 / 669.0	N/A	N/A	N/A	N/A	9.95	13C2-PFTeDA	1252489.58	25.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	N/A	N/A	N/A	N/A	9.95	13C2-PFTeDA	1252489.58	25.000	PFTeDA	N/A	0.021	✓
PFBS_1	298.7 / 79.9	N/A	N/A	N/A	N/A	6.10	13C3-PFBS	396068.75	23.300	PFBS			
PFBS_2	298.9 / 98.8	N/A	N/A	N/A	N/A	6.10	13C3-PFBS	396068.75	23.300	PFBS	N/A	1.105	✓
PFHxS_1	399.0 / 80.0	7.58	661.89	0.183	98637.4	7.55	13C3-PFHxS	288837.90	23.700	PFHxS			
PFHxS_2	399.0 / 99.0	N/A	N/A	N/A	N/A	7.55	13C3-PFHxS	288837.90	23.700	PFHxS	N/A	0.398	
PFOS_1	498.9 / 79.9	N/A	N/A	N/A	N/A	8.51	13C8-PFOS	147007.86	23.950	PFOS			
PFOS_2	498.9 / 98.9	N/A	N/A	N/A	N/A	8.51	13C8-PFOS	147007.86	23.950	PFOS	N/A	0.227	✓
NMeFOSAA_1	570.1 / 419.0	N/A	N/A	N/A	N/A	8.41	d3-MeFOSAA	312826.17	25.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	N/A	N/A	N/A	N/A	8.41	d3-MeFOSAA	312826.17	25.000	NMeFOSAA	N/A	0.063	✓
NEtFOSAA_1	584.2 / 419.1	N/A	N/A	N/A	N/A	8.58	d5-EtFOSAA	290658.76	25.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	N/A	N/A	N/A	N/A	8.58	d5-EtFOSAA	290658.76	25.000	NEtFOSAA	N/A	1.135	✓
HFPO-DA_1	284.9 / 168.9	N/A	N/A	N/A	N/A	6.46	13C3-HFPO-DA	365480.57	25.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	N/A	N/A	N/A	N/A	6.46	13C3-HFPO-DA	365480.57	25.000	HFPO-DA	N/A	0.175	✓
ADONA_1	376.9 / 250.9	N/A	N/A	N/A	N/A	7.47	13C8-PFOA	2631752.78	25.000	ADONA			
ADONA_2	376.9 / 84.8	N/A	N/A	N/A	N/A	7.47	13C8-PFOA	2631752.78	25.000	ADONA	N/A	0.003	✓
9Cl-PF3ONS_1	530.8 / 351.0	N/A	N/A	N/A	N/A	7.47	13C8-PFOA	2631752.78	25.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	N/A	N/A	N/A	N/A	7.47	13C8-PFOA	2631752.78	25.000	9Cl-PF3ONS	N/A	0.356	✓
11Cl-PF3OUdS_1	630.9 / 450.9	N/A	N/A	N/A	N/A	7.47	13C8-PFOA	2631752.78	25.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	N/A	N/A	N/A	N/A	7.47	13C8-PFOA	2631752.78	25.000	11Cl-PF3OUdS	N/A	0.303	✓

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PFAS Sample Quant Report

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Sample Name	DO702LCS-FS(0)	**Injection Vial**	25
Sample ID	Laboratory Control Sample	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 10:59:25 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.21	3262365.34	38.765	2040.5	6.19	13C5-PFHxA	1668418.19	25.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.21	83421.09	42.983	1437.8	6.19	13C5-PFHxA	1668418.19	25.000	PFHxA	0.026	0.025	✓
PFHpA_1	363.1 / 319.0	6.93	5348200.69	43.449	1885.2	6.92	13C4-PFHpA	2644921.01	25.000	PFHpA			
PFHpA_2	363.1 / 169.0	6.94	67861.88	39.698	11682.0	6.92	13C4-PFHpA	2644921.01	25.000	PFHpA	0.013	0.015	✓
PFOA_1	413.0 / 369.0	7.49	4447459.58	50.076	2001.5	7.47	13C8-PFOA	2141871.54	25.000	PFOA			
PFOA_2	413.0 / 169.0	7.49	141876.33	42.548	1127.0	7.47	13C8-PFOA	2141871.54	25.000	PFOA	0.032	0.037	✓
PFNA_1	463.0 / 419.0	7.96	2718534.78	41.031	1879.8	7.94	13C9-PFNA	1555497.92	25.000	PFNA			
PFNA_2	463.0 / 219.0	7.96	460193.78	43.457	3175.7	7.94	13C9-PFNA	1555497.92	25.000	PFNA	0.169	0.167	✓
PFDA_1	512.9 / 469.0	8.39	1129245.01	39.724	1531.9	8.37	13C6-PFDA	1274935.32	25.000	PFDA			
PFDA_2	512.9 / 219.0	8.39	37252.87	49.397	938.6	8.37	13C6-PFDA	1274935.32	25.000	PFDA	0.033	0.028	✓
PFUnA_1	563.1 / 519.0	8.80	2877592.26	48.328	2030.4	8.78	13C7-PFUnA	1622515.14	25.000	PFUnA			
PFUnA_2	563.1 / 269.1	8.80	129617.76	45.206	16381.4	8.78	13C7-PFUnA	1622515.14	25.000	PFUnA	0.045	0.051	✓
PFDoA_1	613.1 / 569.0	9.20	1817515.32	48.525	1764.3	9.18	13C2-PFDoA	1822318.99	25.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.20	346989.85	52.689	5432.7	9.18	13C2-PFDoA	1822318.99	25.000	PFDoA	0.191	0.187	✓
PFTrDA_1	663.0 / 619.0	9.60	2551461.77	46.267	2341.1	9.94	13C2-PFTeDA	1210393.69	25.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	9.60	72993.29	50.075	5436.5	9.94	13C2-PFTeDA	1210393.69	25.000	PFTrDA	0.029	0.026	✓
PFTeDA_1	713.0 / 669.0	9.96	1628488.93	38.958	2368.7	9.94	13C2-PFTeDA	1210393.69	25.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	9.96	34901.98	42.003	1767.6	9.94	13C2-PFTeDA	1210393.69	25.000	PFTeDA	0.021	0.021	✓
PFBS_1	298.7 / 79.9	6.11	129194.71	44.050	337659.4	6.09	13C3-PFBS	351513.07	23.300	PFBS			
PFBS_2	298.9 / 98.8	6.11	141559.42	43.527	1611.8	6.09	13C3-PFBS	351513.07	23.300	PFBS	1.096	1.105	✓
PFHxS_1	399.0 / 80.0	7.57	512267.95	39.802	1102.0	7.55	13C3-PFHxS	276525.93	23.700	PFHxS			
PFHxS_2	399.0 / 99.0	7.56	196483.47	38.809	2254.7	7.55	13C3-PFHxS	276525.93	23.700	PFHxS	0.384	0.398	✓
PFOS_1	498.9 / 79.9	8.52	178285.78	50.634	6049.1	8.50	13C8-PFOS	130556.71	23.950	PFOS			
PFOS_2	498.9 / 98.9	8.52	53178.26	63.815	2703.2	8.50	13C8-PFOS	130556.71	23.950	PFOS	0.298	0.227	✓
NMeFOSAA_1	570.1 / 419.0	8.42	439014.46	48.066	2934.4	8.41	d3-MeFOSAA	275197.91	25.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.42	26776.21	53.992	765.0	8.41	d3-MeFOSAA	275197.91	25.000	NMeFOSAA	0.061	0.063	✓
NEtFOSAA_1	584.2 / 419.1	8.59	399464.11	49.886	12131.3	8.58	d5-EtFOSAA	252906.62	25.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.59	443419.29	48.758	6462413.3	8.58	d5-EtFOSAA	252906.62	25.000	NEtFOSAA	1.110	1.135	✓
HFPO-DA_1	284.9 / 168.9	6.47	628183.06	39.596	5209.9	6.46	13C3-HFPO-DA	332844.79	25.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.47	93414.90	42.312	715.6	6.46	13C3-HFPO-DA	332844.79	25.000	HFPO-DA	0.149	0.175	✓
ADONA_1	376.9 / 250.9	7.14	8287604.50	51.001	32364.1	7.47	13C8-PFOA	2141871.54	25.000	ADONA			
ADONA_2	376.9 / 84.8	7.14	19080.95	49.533	508.9	7.47	13C8-PFOA	2141871.54	25.000	ADONA	0.002	0.003	✓
9Cl-PF3ONS_1	530.8 / 351.0	8.80	1715242.48	42.705	4816.1	7.47	13C8-PFOA	2141871.54	25.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	8.80	637144.61	46.836	6212.0	7.47	13C8-PFOA	2141871.54	25.000	9Cl-PF3ONS	0.372	0.356	✓
11Cl-PF3OUdS_1	630.9 / 450.9	9.62	4995242.73	46.899	3902.1	7.47	13C8-PFOA	2141871.54	25.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	9.62	1459163.16	45.696	4268.5	7.47	13C8-PFOA	2141871.54	25.000	11Cl-PF3OUdS	0.292	0.303	✓

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PFAS Sample Quant Report

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Printed: 23/08/2023 10:32:39 AM

Sample Name	D7902-FS(0)	**Injection Vial**	26
Sample ID	NBKK-B76-IDW01-AQ-081623	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 11:15:29 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.22	72583.58	9.063	61.8	6.21	13C5-PFHxA	161757.46	25.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.23	1255.88	6.731	28.9	6.21	13C5-PFHxA	161757.46	25.000	PFHxA	0.017	0.025	✓
PFHpA_1	363.1 / 319.0	6.95	81139.99	5.687	97.5	6.93	13C4-PFHpA	313689.89	25.000	PFHpA			
PFHpA_2	363.1 / 169.0	6.94	1478.90	7.267	1770.9	6.93	13C4-PFHpA	313689.89	25.000	PFHpA	0.018	0.015	✓
PFOA_1	413.0 / 369.0	7.46	67593.60	7.348	304.7	7.44	13C8-PFOA	224107.48	25.000	PFOA			
PFOA_2	413.0 / 169.0	7.45	1774.75	5.218	141.8	7.44	13C8-PFOA	224107.48	25.000	PFOA	0.026	0.037	✓
PFNA_1	463.0 / 419.0	N/A	N/A	N/A	N/A	7.61	13C9-PFNA	54369.49	25.000	PFNA			
PFNA_2	463.0 / 219.0	N/A	N/A	N/A	N/A	7.61	13C9-PFNA	54369.49	25.000	PFNA	N/A	0.167	✓
PFDA_1	512.9 / 469.0	N/A	N/A	N/A	N/A	7.84	13C6-PFDA	15053.47	25.000	PFDA			
PFDA_2	512.9 / 219.0	N/A	N/A	N/A	N/A	7.84	13C6-PFDA	15053.47	25.000	PFDA	N/A	0.028	✓
PFUnA_1	563.1 / 519.0	N/A	N/A	N/A	N/A	8.22	13C7-PFUnA	36942.14	25.000	PFUnA			
PFUnA_2	563.1 / 269.1	N/A	N/A	N/A	N/A	8.22	13C7-PFUnA	36942.14	25.000	PFUnA	N/A	0.051	✓
PFDoA_1	613.1 / 569.0	N/A	N/A	N/A	N/A	8.94	13C2-PFDoA	72353.46	25.000	PFDoA			
PFDoA_2	613.1 / 319.0	N/A	N/A	N/A	N/A	8.94	13C2-PFDoA	72353.46	25.000	PFDoA	N/A	0.187	✓
PFTrDA_1	663.0 / 619.0	N/A	N/A	N/A	N/A	9.95	13C2-PFTeDA	94956.37	25.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	N/A	N/A	N/A	N/A	9.95	13C2-PFTeDA	94956.37	25.000	PFTrDA	N/A	0.026	✓
PFTeDA_1	713.0 / 669.0	N/A	N/A	N/A	N/A	9.95	13C2-PFTeDA	94956.37	25.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	N/A	N/A	N/A	N/A	9.95	13C2-PFTeDA	94956.37	25.000	PFTeDA	N/A	0.021	✓
PFBS_1	298.7 / 79.9	N/A	N/A	N/A	N/A	6.11	13C3-PFBS	47293.91	23.300	PFBS			
PFBS_2	298.9 / 98.8	N/A	N/A	N/A	N/A	6.11	13C3-PFBS	47293.91	23.300	PFBS	N/A	1.105	✓
PFHxS_1	399.0 / 80.0	7.54	10447.29	5.842	87.7	7.52	13C3-PFHxS	39192.21	23.700	PFHxS			
PFHxS_2	399.0 / 99.0	7.54	2860.48	4.089	2496.4	7.52	13C3-PFHxS	39192.21	23.700	PFHxS	0.274	0.398	✓
PFOS_1	498.9 / 79.9	7.95	2753.17	24.058	16.8	7.91	13C8-PFOS	4236.78	23.950	PFOS			
PFOS_2	498.9 / 98.9	7.95	1378.64	50.996	152.8	7.91	13C8-PFOS	4236.78	23.950	PFOS	0.501	0.227	
NMeFOSAA_1	570.1 / 419.0	N/A	N/A	N/A	N/A	7.92	d3-MeFOSAA	4987.47	25.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	N/A	N/A	N/A	N/A	7.92	d3-MeFOSAA	4987.47	25.000	NMeFOSAA	N/A	0.063	✓
NEtFOSAA_1	584.2 / 419.1	N/A	N/A	N/A	N/A	8.04	d5-EtFOSAA	3797.07	25.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	N/A	N/A	N/A	N/A	8.04	d5-EtFOSAA	3797.07	25.000	NEtFOSAA	N/A	1.135	✓
HFPO-DA_1	284.9 / 168.9	N/A	N/A	N/A	N/A	6.47	13C3-HFPO-DA	27547.15	25.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	N/A	N/A	N/A	N/A	6.47	13C3-HFPO-DA	27547.15	25.000	HFPO-DA	N/A	0.175	✓
ADONA_1	376.9 / 250.9	N/A	N/A	N/A	N/A	7.44	13C8-PFOA	224107.48	25.000	ADONA			
ADONA_2	376.9 / 84.8	N/A	N/A	N/A	N/A	7.44	13C8-PFOA	224107.48	25.000	ADONA	N/A	0.003	✓
9Cl-PF3ONS_1	530.8 / 351.0	N/A	N/A	N/A	N/A	7.44	13C8-PFOA	224107.48	25.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	N/A	N/A	N/A	N/A	7.44	13C8-PFOA	224107.48	25.000	9Cl-PF3ONS	N/A	0.356	✓
11Cl-PF3OUdS_1	630.9 / 450.9	N/A	N/A	N/A	N/A	7.44	13C8-PFOA	224107.48	25.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	N/A	N/A	N/A	N/A	7.44	13C8-PFOA	224107.48	25.000	11Cl-PF3OUdS	N/A	0.303	✓

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PFAS Sample Quant Report

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Sample Name	D7903-FS(0)	**Injection Vial**	27
Sample ID	NBKK-B76-IDW02-AQ-081623	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 11:31:33 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.22	286917.14	2.895	503.9	6.20	13C5-PFHxA	2111599.03	25.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.23	7865.09	3.264	226.7	6.20	13C5-PFHxA	2111599.03	25.000	PFHxA	0.027	0.025	✓
PFHpA_1	363.1 / 319.0	6.95	225278.39	1.537	232.7	6.93	13C4-PFHpA	3473516.75	25.000	PFHpA			
PFHpA_2	363.1 / 169.0	6.95	1837.59	0.786	237.2	6.93	13C4-PFHpA	3473516.75	25.000	PFHpA	0.008	0.015	✓
PFOA_1	413.0 / 369.0	7.50	179284.51	3.041	343.3	7.48	13C8-PFOA	1460861.58	25.000	PFOA			
PFOA_2	413.0 / 169.0	7.49	6802.62	3.130	620052.4	7.48	13C8-PFOA	1460861.58	25.000	PFOA	0.038	0.037	✓
PFNA_1	463.0 / 419.0	7.98	8517.05	0.568	22.6	7.95	13C9-PFNA	1320273.99	25.000	PFNA			
PFNA_2	463.0 / 219.0	7.97	1491.94	0.378	714.5	7.95	13C9-PFNA	1320273.99	25.000	PFNA	0.175	0.167	✓
PFDA_1	512.9 / 469.0	8.40	2250.32	0.176	15.8	8.38	13C6-PFDA	1656787.85	25.000	PFDA			
PFDA_2	512.9 / 219.0	N/A	N/A	N/A	N/A	8.38	13C6-PFDA	1656787.85	25.000	PFDA	N/A	0.028	
PFUnA_1	563.1 / 519.0	N/A	N/A	N/A	N/A	8.79	13C7-PFUnA	2140638.57	25.000	PFUnA			
PFUnA_2	563.1 / 269.1	N/A	N/A	N/A	N/A	8.79	13C7-PFUnA	2140638.57	25.000	PFUnA	N/A	0.051	✓
PFDoA_1	613.1 / 569.0	N/A	N/A	N/A	N/A	9.19	13C2-PFDoA	2165263.06	25.000	PFDoA			
PFDoA_2	613.1 / 319.0	N/A	N/A	N/A	N/A	9.19	13C2-PFDoA	2165263.06	25.000	PFDoA	N/A	0.187	✓
PFTrDA_1	663.0 / 619.0	N/A	N/A	N/A	N/A	9.95	13C2-PFTeDA	711946.35	25.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	N/A	N/A	N/A	N/A	9.95	13C2-PFTeDA	711946.35	25.000	PFTrDA	N/A	0.026	✓
PFTeDA_1	713.0 / 669.0	N/A	N/A	N/A	N/A	9.95	13C2-PFTeDA	711946.35	25.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	N/A	N/A	N/A	N/A	9.95	13C2-PFTeDA	711946.35	25.000	PFTeDA	N/A	0.021	✓
PFBS_1	298.7 / 79.9	6.12	1608.39	0.250	197.9	6.10	13C3-PFBS	462361.83	23.300	PFBS			
PFBS_2	298.9 / 98.8	6.12	2196.15	0.355	48.5	6.10	13C3-PFBS	462361.83	23.300	PFBS	1.365	1.105	✓
PFHxS_1	399.0 / 80.0	7.58	20598.38	2.070	503.8	7.56	13C3-PFHxS	227904.77	23.700	PFHxS			
PFHxS_2	399.0 / 99.0	7.57	5456.80	1.418	2953.7	7.56	13C3-PFHxS	227904.77	23.700	PFHxS	0.265	0.398	✓
PFOS_1	498.9 / 79.9	8.47	19266.96	4.426	158.1	8.51	13C8-PFOS	159139.85	23.950	PFOS			
PFOS_2	498.9 / 98.9	8.52	4614.50	4.616	2973.2	8.51	13C8-PFOS	159139.85	23.950	PFOS	0.240	0.227	✓
NMeFOSAA_1	570.1 / 419.0	N/A	N/A	N/A	N/A	8.42	d3-MeFOSAA	370306.64	25.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	N/A	N/A	N/A	N/A	8.42	d3-MeFOSAA	370306.64	25.000	NMeFOSAA	N/A	0.063	✓
NEtFOSAA_1	584.2 / 419.1	N/A	N/A	N/A	N/A	8.58	d5-EtFOSAA	363644.03	25.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	N/A	N/A	N/A	N/A	8.58	d5-EtFOSAA	363644.03	25.000	NEtFOSAA	N/A	1.135	✓
HFPO-DA_1	284.9 / 168.9	N/A	N/A	N/A	N/A	6.47	13C3-HFPO-DA	366814.87	25.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	N/A	N/A	N/A	N/A	6.47	13C3-HFPO-DA	366814.87	25.000	HFPO-DA	N/A	0.175	✓
ADONA_1	376.9 / 250.9	N/A	N/A	N/A	N/A	7.48	13C8-PFOA	1460861.58	25.000	ADONA			
ADONA_2	376.9 / 84.8	N/A	N/A	N/A	N/A	7.48	13C8-PFOA	1460861.58	25.000	ADONA	N/A	0.003	✓
9Cl-PF3ONS_1	530.8 / 351.0	N/A	N/A	N/A	N/A	7.48	13C8-PFOA	1460861.58	25.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	N/A	N/A	N/A	N/A	7.48	13C8-PFOA	1460861.58	25.000	9Cl-PF3ONS	N/A	0.356	✓
11Cl-PF3OUdS_1	630.9 / 450.9	9.64	1485.31	0.125	183.3	7.48	13C8-PFOA	1460861.58	25.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	9.63	206.55	0.091	45.1	7.48	13C8-PFOA	1460861.58	25.000	11Cl-PF3OUdS	0.139	0.303	

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PFAS Sample Quant Report

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Sample Name	LZ91 IB	**Injection Vial**	11
Sample ID	Instrument Blank	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 7:14:23 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.20	1778070.60	5.428	6805.2	7.47	13C2-PFOA	1785806.39	5.000				
13C4-PFHpA	367.1 / 322.0	6.93	2848321.12	5.387	11831.8	7.47	13C2-PFOA	1785806.39	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.48	2473652.05	5.390	1661111.0	7.47	13C2-PFOA	1785806.39	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.95	1666418.49	5.375	6462.7	7.47	13C2-PFOA	1785806.39	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.38	1303497.57	4.889	4154.3	8.38	13C2-PFDA	976831.89	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.79	1810377.62	5.055	3520.6	8.38	13C2-PFDA	976831.89	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.20	2023352.98	4.857	5032.9	8.38	13C2-PFDA	976831.89	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	9.95	1244591.58	4.727	2446.7	8.38	13C2-PFDA	976831.89	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.10	402512.45	4.804	3118.0	8.51	13C4-PFOS	70864.06	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.56	300460.59	4.724	5037.8	8.51	13C4-PFOS	70864.06	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.51	157000.95	4.699	19923.5	8.51	13C4-PFOS	70864.06	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.42	323760.80	5.911	2366.4	7.47	13C2-PFOA	1785806.39	5.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.59	298488.37	5.483	29977.5	7.47	13C2-PFOA	1785806.39	5.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.46	368923.25	5.164	4666.5	7.47	13C2-PFOA	1785806.39	5.000		N/A	N/A	✓

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PFAS Sample Quant Report

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Sample Name	DO701PB-FS(0)	**Injection Vial**	24
Sample ID	Procedural Blank	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 10:43:21 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.20	1840154.77	24.416	8823.2	7.47	13C2-PFOA	2054424.23	25.000				
13C4-PFHpA	367.1 / 322.0	6.92	3082009.16	25.336	7919.5	7.47	13C2-PFOA	2054424.23	25.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.47	2631752.78	24.922	8986.3	7.47	13C2-PFOA	2054424.23	25.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.94	1806254.92	25.322	187669.9	7.47	13C2-PFOA	2054424.23	25.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.37	1361320.24	24.579	5663.7	8.37	13C2-PFDA	1014620.45	25.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.79	1854698.86	24.930	3961.1	8.37	13C2-PFDA	1014620.45	25.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.19	2058880.31	23.793	3896.1	8.37	13C2-PFDA	1014620.45	25.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	9.95	1252489.58	22.898	2211.7	8.37	13C2-PFDA	1014620.45	25.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.10	396068.75	20.707	3554.9	8.50	13C4-PFOS	80882.64	23.950		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.55	288837.90	19.892	3572.0	8.50	13C4-PFOS	80882.64	23.950		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.51	147007.86	19.273	355919.3	8.50	13C4-PFOS	80882.64	23.950		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.41	312826.17	24.821	1327.0	7.47	13C2-PFOA	2054424.23	25.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.58	290658.76	23.204	5606.9	7.47	13C2-PFOA	2054424.23	25.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.46	365480.57	22.235	17492.1	7.47	13C2-PFOA	2054424.23	25.000		N/A	N/A	✓

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PFAS Sample Quant Report

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Sample Name	DO702LCS-FS(0)	**Injection Vial**	25
Sample ID	Laboratory Control Sample	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 10:59:25 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.19	1668418.19	23.495	7782.4	7.46	13C2-PFOA	1935715.24	25.000				
13C4-PFHpA	367.1 / 322.0	6.92	2644921.01	23.076	36205.2	7.46	13C2-PFOA	1935715.24	25.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.47	2141871.54	21.527	16588376.0	7.46	13C2-PFOA	1935715.24	25.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.94	1555497.92	23.144	5351.5	7.46	13C2-PFOA	1935715.24	25.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.37	1274935.32	23.255	5154.9	8.37	13C2-PFDA	1004345.95	25.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.78	1622515.14	22.032	6804.9	8.37	13C2-PFDA	1004345.95	25.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.18	1822318.99	21.275	4002.9	8.37	13C2-PFDA	1004345.95	25.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	9.94	1210393.69	22.355	2397.9	8.37	13C2-PFDA	1004345.95	25.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.09	351513.07	20.820	2020.8	8.50	13C4-PFOS	71396.09	23.950		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.55	276525.93	21.575	2505.3	8.50	13C4-PFOS	71396.09	23.950		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.50	130556.71	19.390	3819.4	8.50	13C4-PFOS	71396.09	23.950		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.41	275197.91	23.175	1867.5	7.46	13C2-PFOA	1935715.24	25.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.58	252906.62	21.428	1985.1	7.46	13C2-PFOA	1935715.24	25.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.46	332844.79	21.491	117751.4	7.46	13C2-PFOA	1935715.24	25.000		N/A	N/A	✓

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PFAS Sample Quant Report

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Sample Name	D7902-FS(0)	**Injection Vial**	26
Sample ID	NBKK-B76-IDW01-AQ-081623	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 11:15:29 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.21	161757.46	4.295	1112.8	7.43	13C2-PFOA	1026542.52	25.000				
13C4-PFHpA	367.1 / 322.0	6.93	313689.89	5.161	5285.8	7.43	13C2-PFOA	1026542.52	25.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.44	224107.48	4.247	5839.2	7.43	13C2-PFOA	1026542.52	25.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.61	54369.49	1.525	8724.8	7.43	13C2-PFOA	1026542.52	25.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	7.84	15053.47	4.225	2317.5	7.83	13C2-PFDA	65272.67	25.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.22	36942.14	7.719	1094.0	7.83	13C2-PFDA	65272.67	25.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	8.94	72353.46	12.997	2903.6	7.83	13C2-PFDA	65272.67	25.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	9.95	94956.37	26.985	2154.6	7.83	13C2-PFDA	65272.67	25.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.11	47293.91	21.782	310.6	7.91	13C4-PFOS	9181.33	23.950		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.52	39192.21	23.778	275.4	7.91	13C4-PFOS	9181.33	23.950		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	7.91	4236.78	4.893	770.1	7.91	13C4-PFOS	9181.33	23.950		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	7.92	4987.47	0.792	17093.3	7.43	13C2-PFOA	1026542.52	25.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.04	3797.07	0.607	233.7	7.43	13C2-PFOA	1026542.52	25.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.47	27547.15	3.354	979.6	7.43	13C2-PFOA	1026542.52	25.000		N/A	N/A	✓

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PFAS Sample Quant Report

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Sample Name	D7903-FS(0)	**Injection Vial**	27
Sample ID	NBKK-B76-IDW02-AQ-081623	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 11:31:33 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

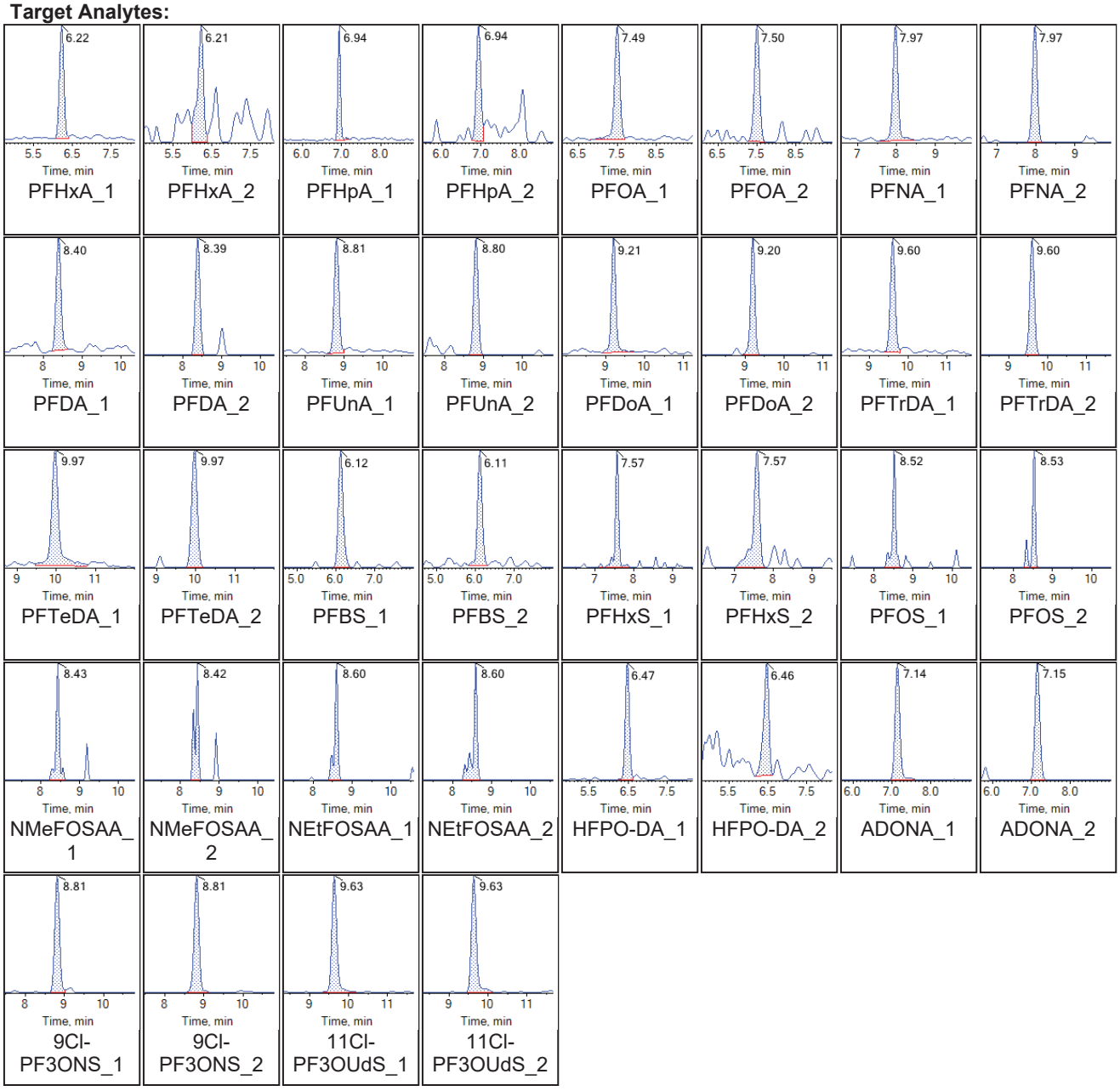
Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.20	2111599.03	44.187	2528.2	7.47	13C2-PFOA	1302652.86	25.000				
13C4-PFHpA	367.1 / 322.0	6.93	3473516.75	45.034	9173.8	7.47	13C2-PFOA	1302652.86	25.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.48	1460861.58	21.817	14169.4	7.47	13C2-PFOA	1302652.86	25.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.95	1320273.99	29.191	3793.7	7.47	13C2-PFOA	1302652.86	25.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.38	1656787.85	21.240	4871.9	8.38	13C2-PFDA	1428968.87	25.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.79	2140638.57	20.430	4354.3	8.38	13C2-PFDA	1428968.87	25.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.19	2165263.06	17.767	7750.5	8.38	13C2-PFDA	1428968.87	25.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	9.95	711946.35	9.242	2718.9	8.38	13C2-PFDA	1428968.87	25.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.10	462361.83	31.261	2107.6	8.51	13C4-PFOS	62544.61	23.950		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.56	227904.77	20.298	2460.3	8.51	13C4-PFOS	62544.61	23.950		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.51	159139.85	26.981	10026.5	8.51	13C4-PFOS	62544.61	23.950		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.42	370306.64	46.339	2231.9	7.47	13C2-PFOA	1302652.86	25.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.58	363644.03	45.784	4317.8	7.47	13C2-PFOA	1302652.86	25.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.47	366814.87	35.195	7318.8	7.47	13C2-PFOA	1302652.86	25.000		N/A	N/A	✓

Chromatograms

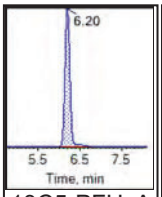
Sample Name	LZ83	**Injection Vial**	3
Sample ID	L1	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034

Chromatograms

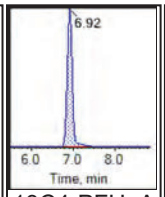
Target Analytes:



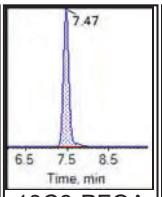
Internal Standards:



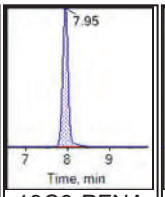
13C5-PFHxA



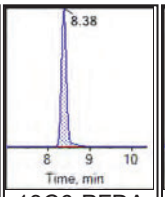
13C4-PFHpA



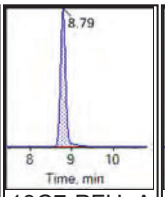
13C8-PFOA



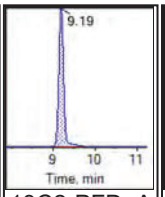
13C9-PFNA



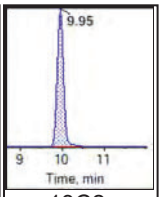
13C6-PFDA



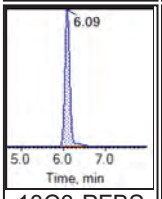
13C7-PFUnA



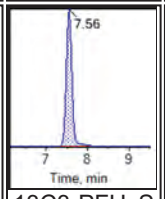
13C2-PFDoA



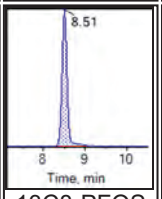
13C2-PFTeDA



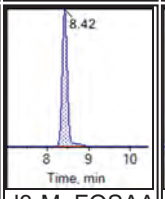
13C3-PFBS



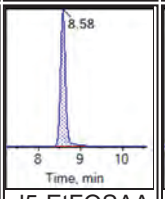
13C3-PFHxS



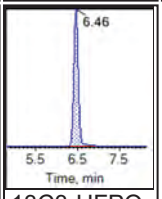
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA

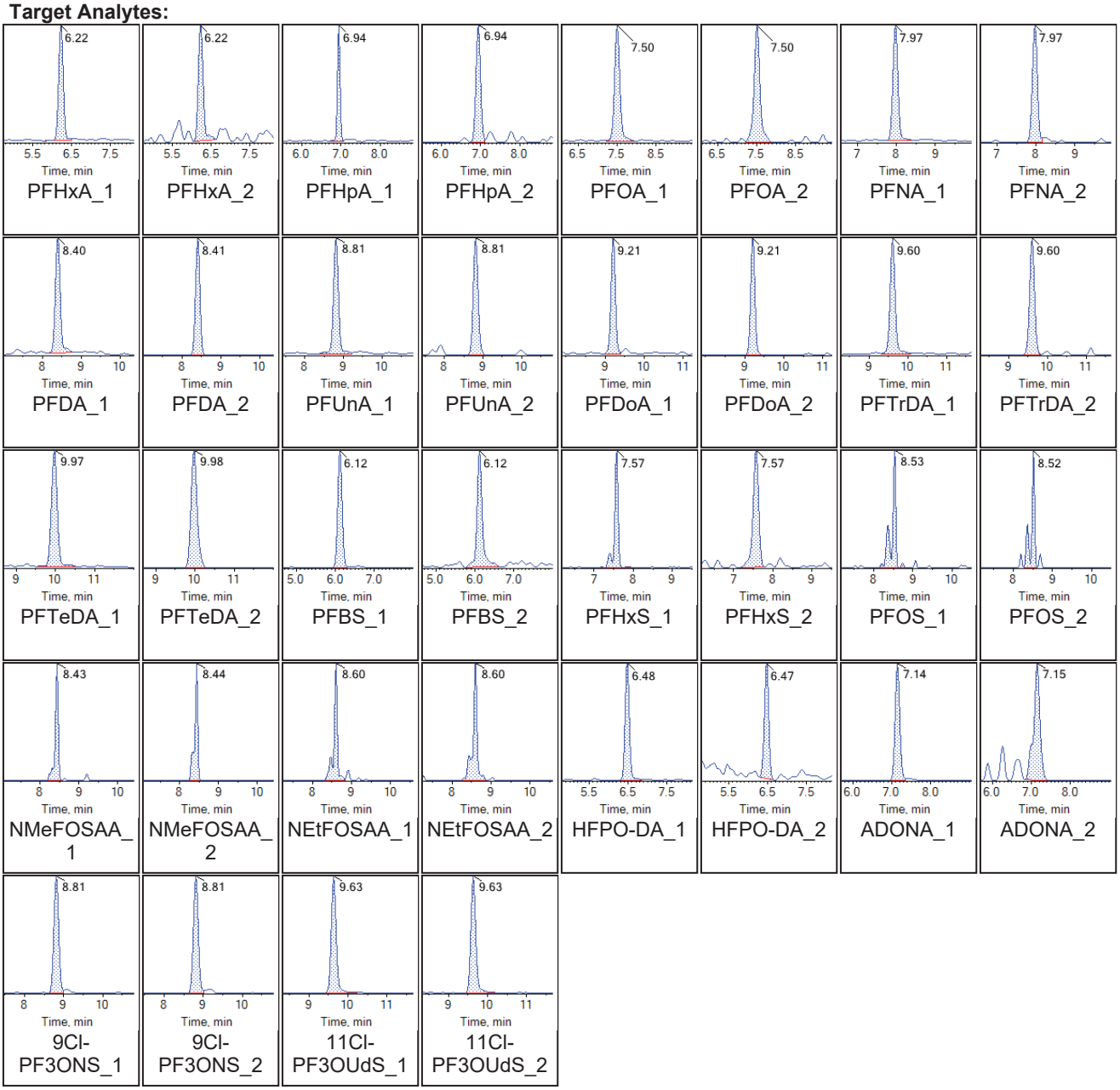


13C3-HFPO-DA

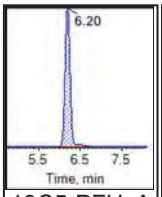
Sample Name	LZ84	**Injection Vial**	4
Sample ID	L2	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:21:58 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034

Chromatograms

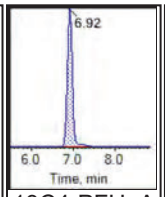
Target Analytes:



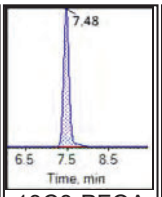
Internal Standards:



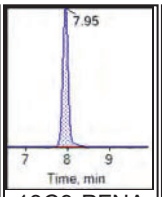
13C5-PFHxA



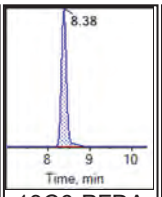
13C4-PFHpA



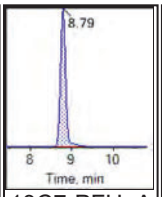
13C8-PFOA



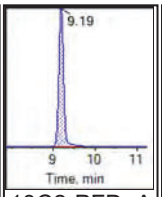
13C9-PFNA



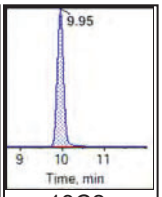
13C6-PFDA



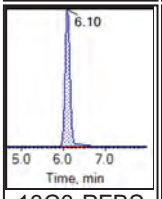
13C7-PFUnA



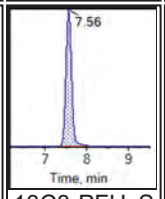
13C2-PFDoA



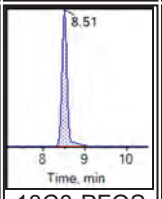
13C2-PFTeDA



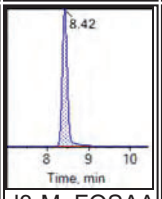
13C3-PFBS



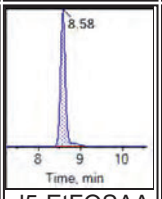
13C3-PFHxS



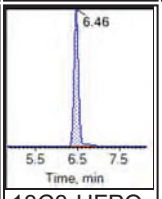
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA



13C3-HFPO-DA

Sample Name	LZ85	**Injection Vial**	5
Sample ID	L3	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:38:02 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034

Chromatograms

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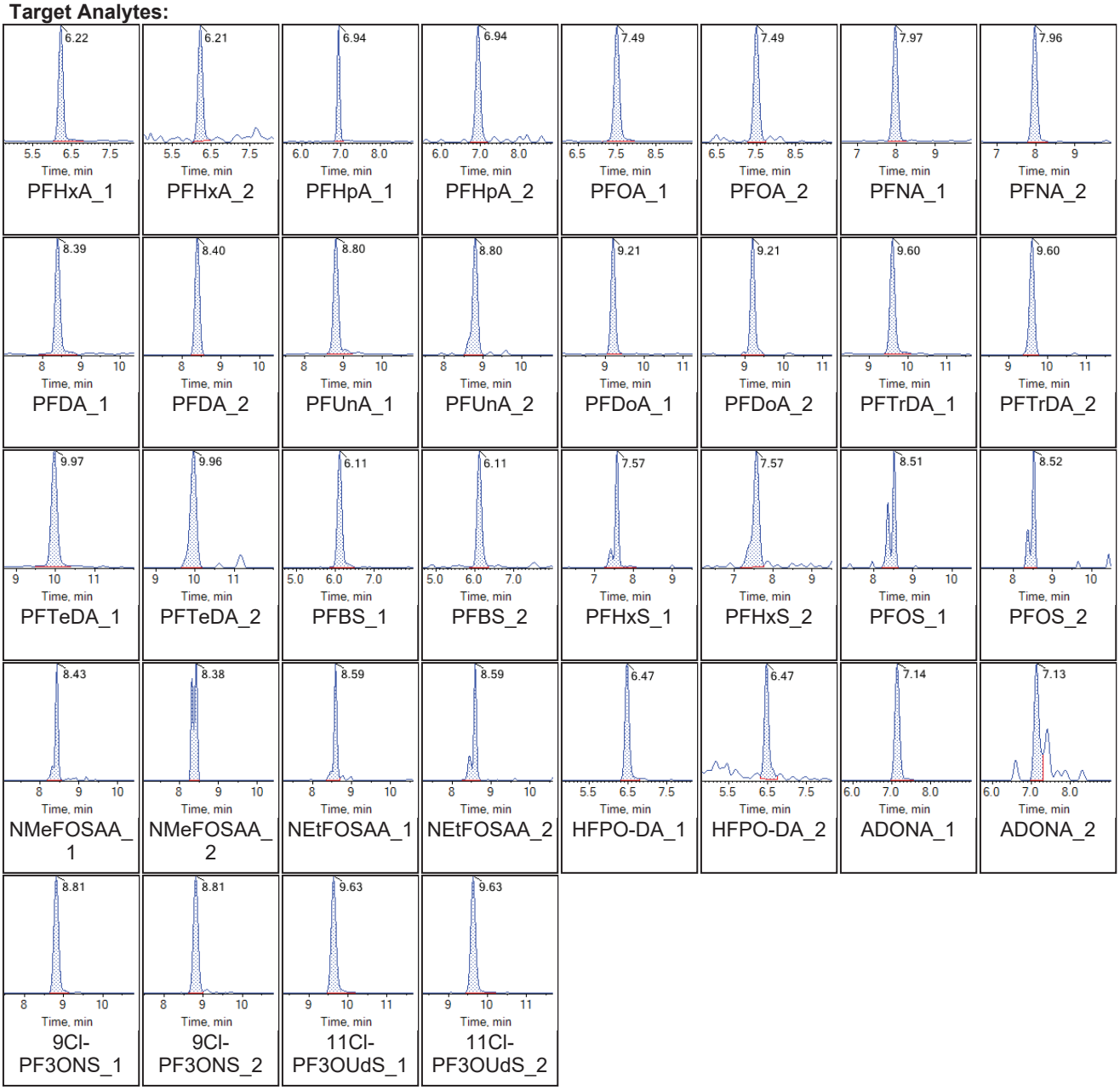
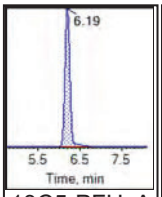
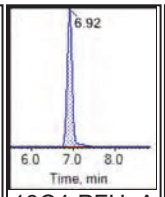


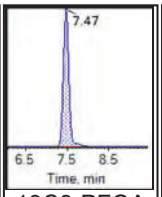
Internal Standards:



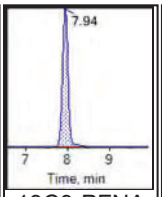
13C5-PFHxA



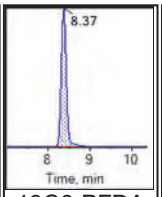
13C4-PFHpA



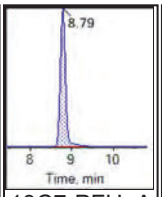
13C8-PFOA



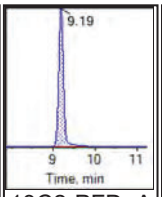
13C9-PFNA



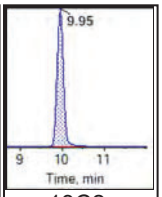
13C6-PFDA



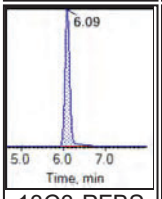
13C7-PFUnA



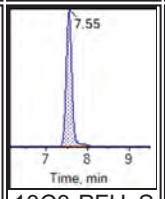
13C2-PFDoA



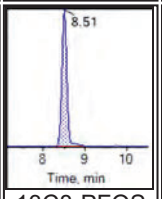
13C2-PFTeDA



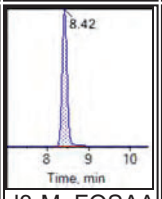
13C3-PFBS



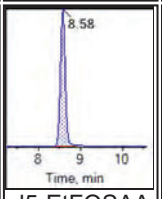
13C3-PFHxS



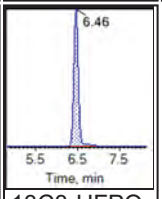
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA

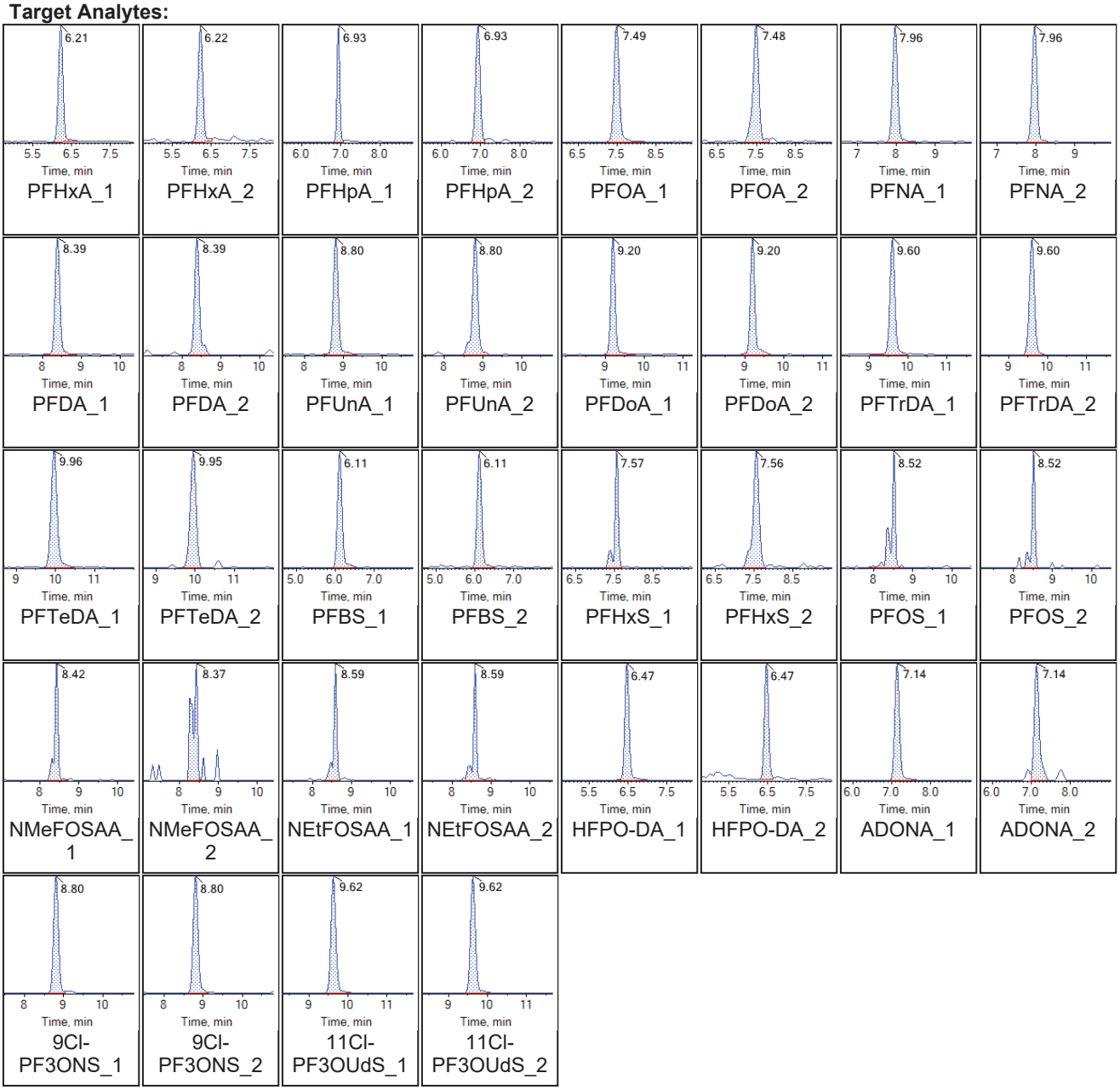


13C3-HFPO-DA

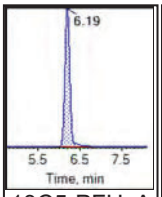
Sample Name	LZ86	**Injection Vial**	6
Sample ID	L4	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:54:06 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034

Chromatograms

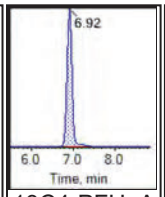
Target Analytes:



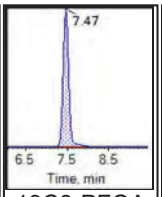
Internal Standards:



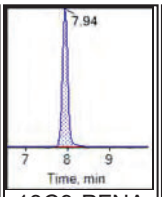
13C5-PFHxA



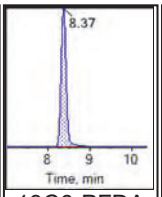
13C4-PFHpA



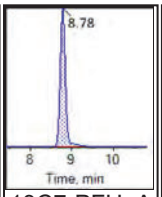
13C8-PFOA



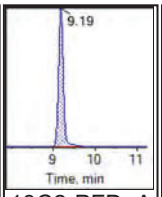
13C9-PFNA



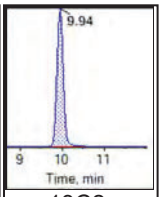
13C6-PFDA



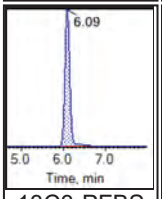
13C7-PFUnA



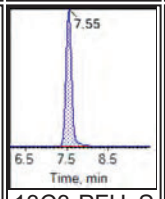
13C2-PFDoA



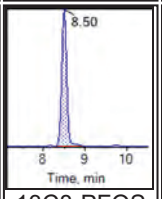
13C2-PFTeDA



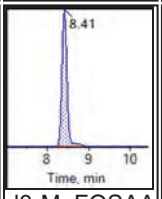
13C3-PFBS



13C3-PFHxS



13C8-PFOS



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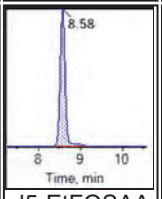

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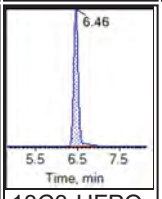
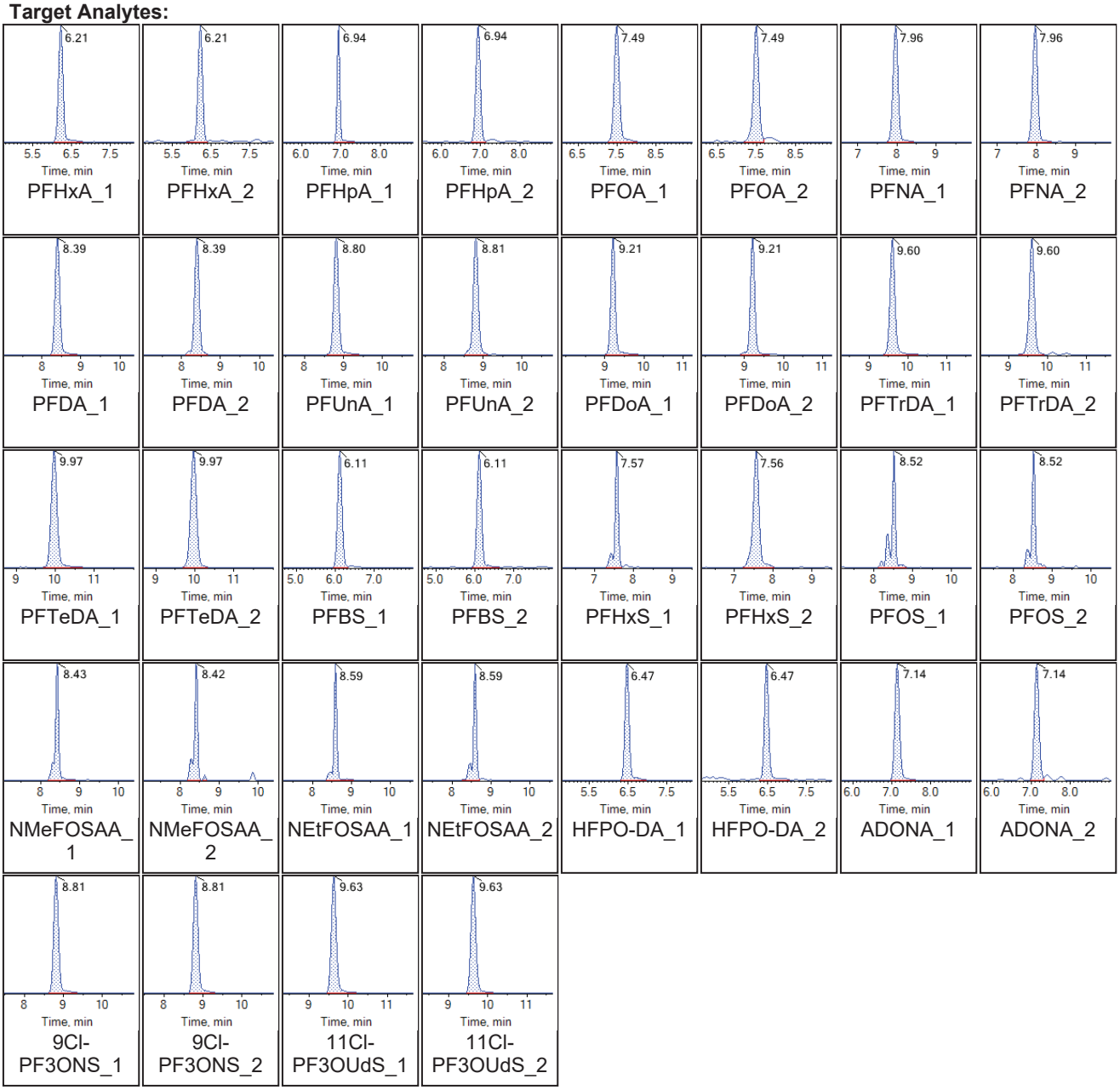


13C3-HFPO-DA

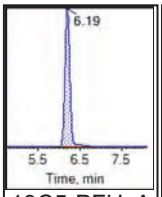
Sample Name	LZ87	**Injection Vial**	7
Sample ID	L5	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:10:10 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034

Chromatograms

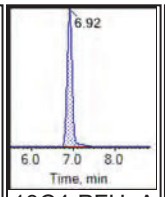
Target Analytes:



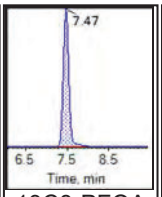
Internal Standards:



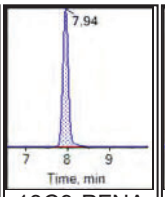
13C5-PFHxA



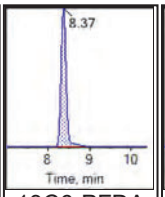
13C4-PFHpA



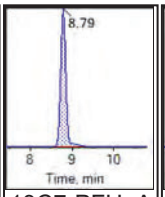
13C8-PFOA



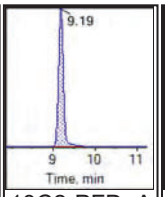
13C9-PFNA



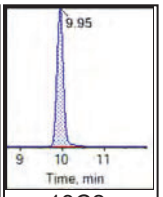
13C6-PFDA



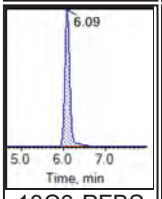
13C7-PFUnA



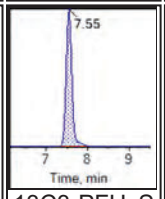
13C2-PFDoA



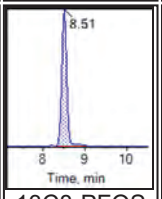
13C2-PFTeDA



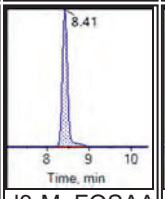
13C3-PFBS



13C3-PFHxS



13C8-PFOS



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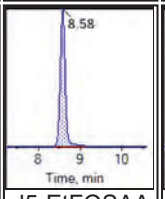

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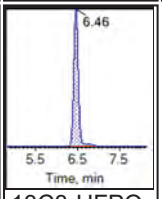
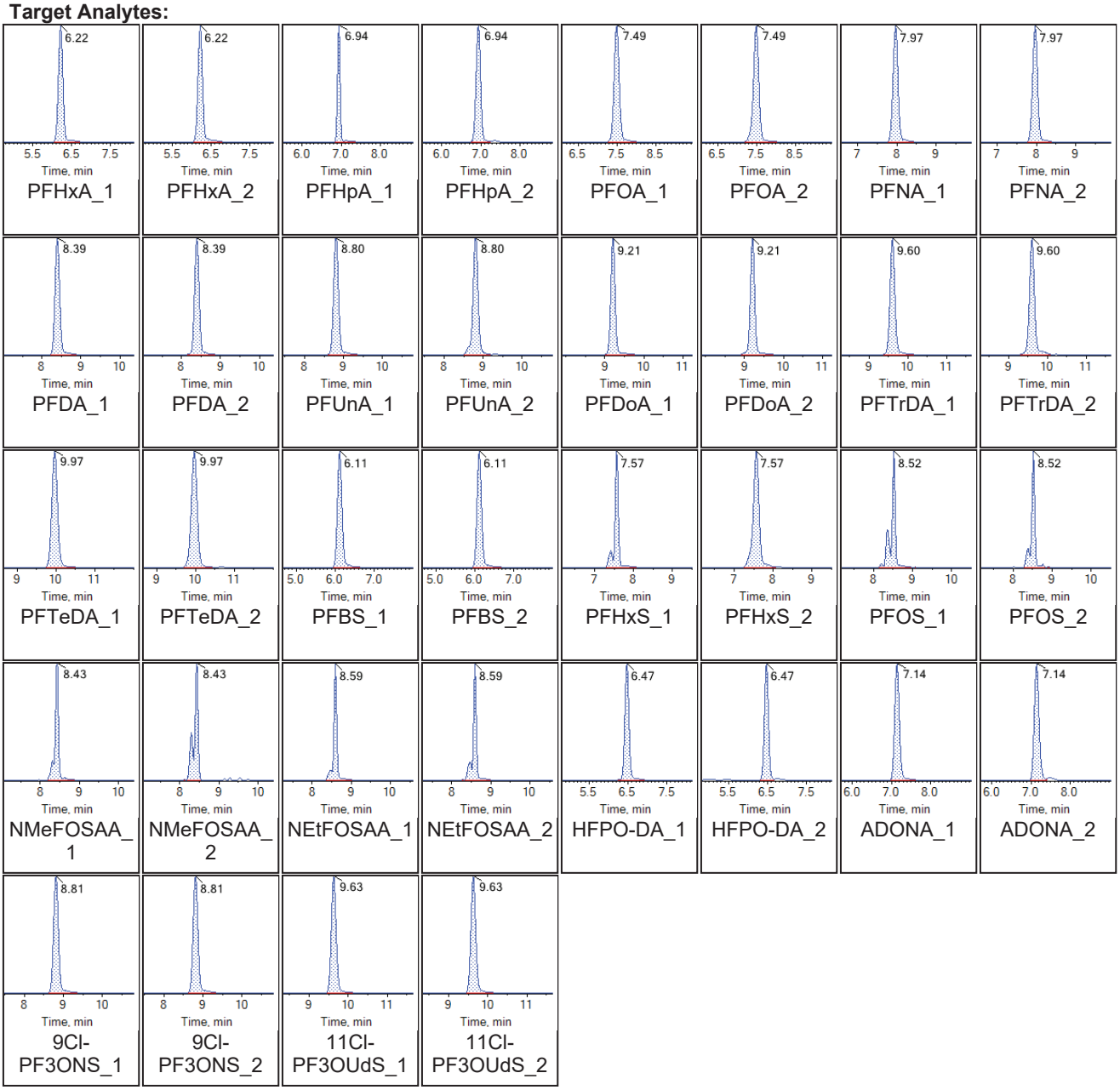


13C3-HFPO-DA

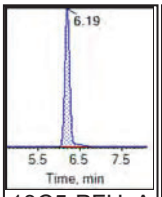
Sample Name	LZ88	**Injection Vial**	8
Sample ID	L6	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:26:12 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034

Chromatograms

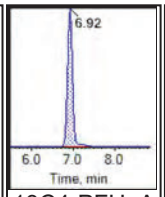
Target Analytes:



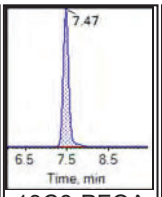
Internal Standards:



13C5-PFHxA



13C4-PFHpA



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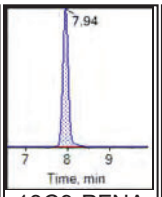
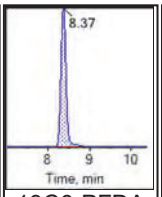


13C9-PFNA



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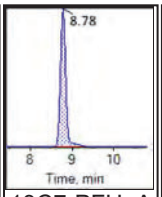
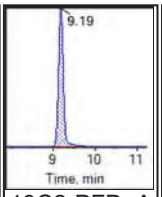


13C7-PFUnA



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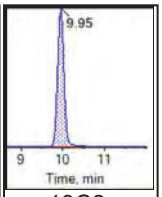

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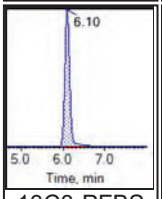
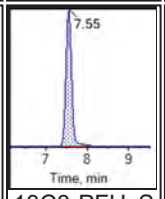
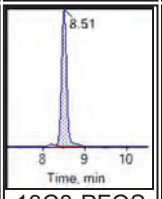


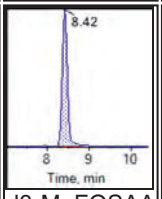
13C3-PFBS



13C3-PFHxS



13C8-PFOS



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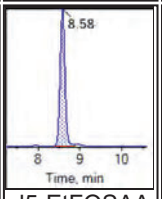
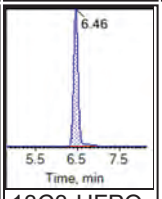


d5-EtFOSAA

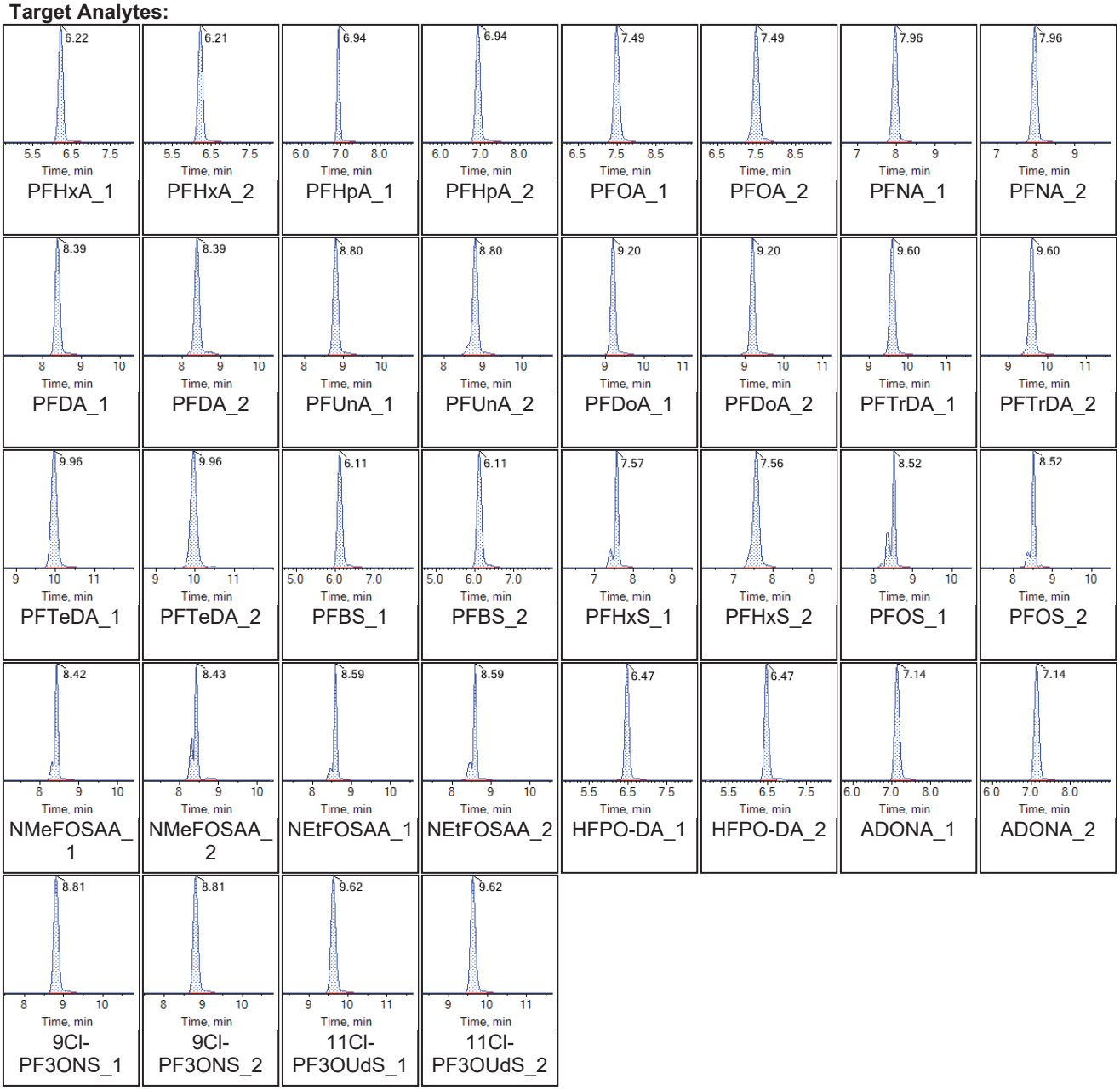


13C3-HFPO-DA

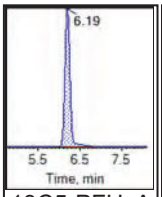
Sample Name	LZ89	**Injection Vial**	9
Sample ID	L7	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:42:16 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034

Chromatograms

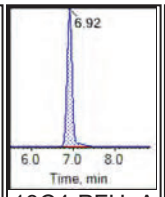
Target Analytes:



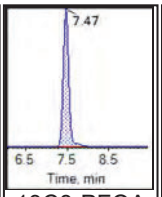
Internal Standards:



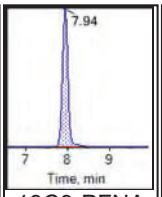
13C5-PFHxA



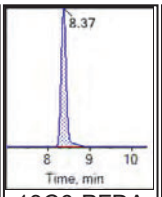
13C4-PFHpA



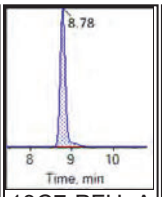
13C8-PFOA



13C9-PFNA



13C6-PFDA



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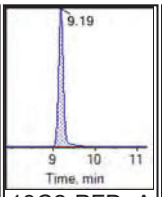
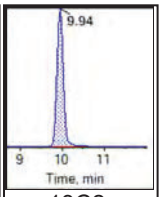
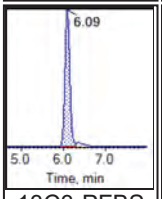


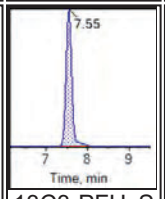
13C2-PFDoA



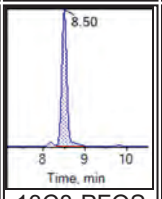
13C2-PFTeDA



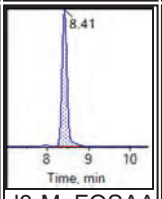
13C3-PFBS



13C3-PFHxS



13C8-PFOS



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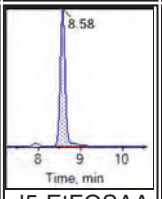
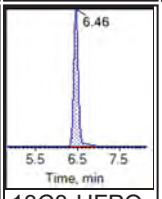


d5-EtFOSAA



13C3-HFPO-DA

Sample Name	LZ90	**Injection Vial**	10
Sample ID	L8	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:58:19 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034

Chromatograms

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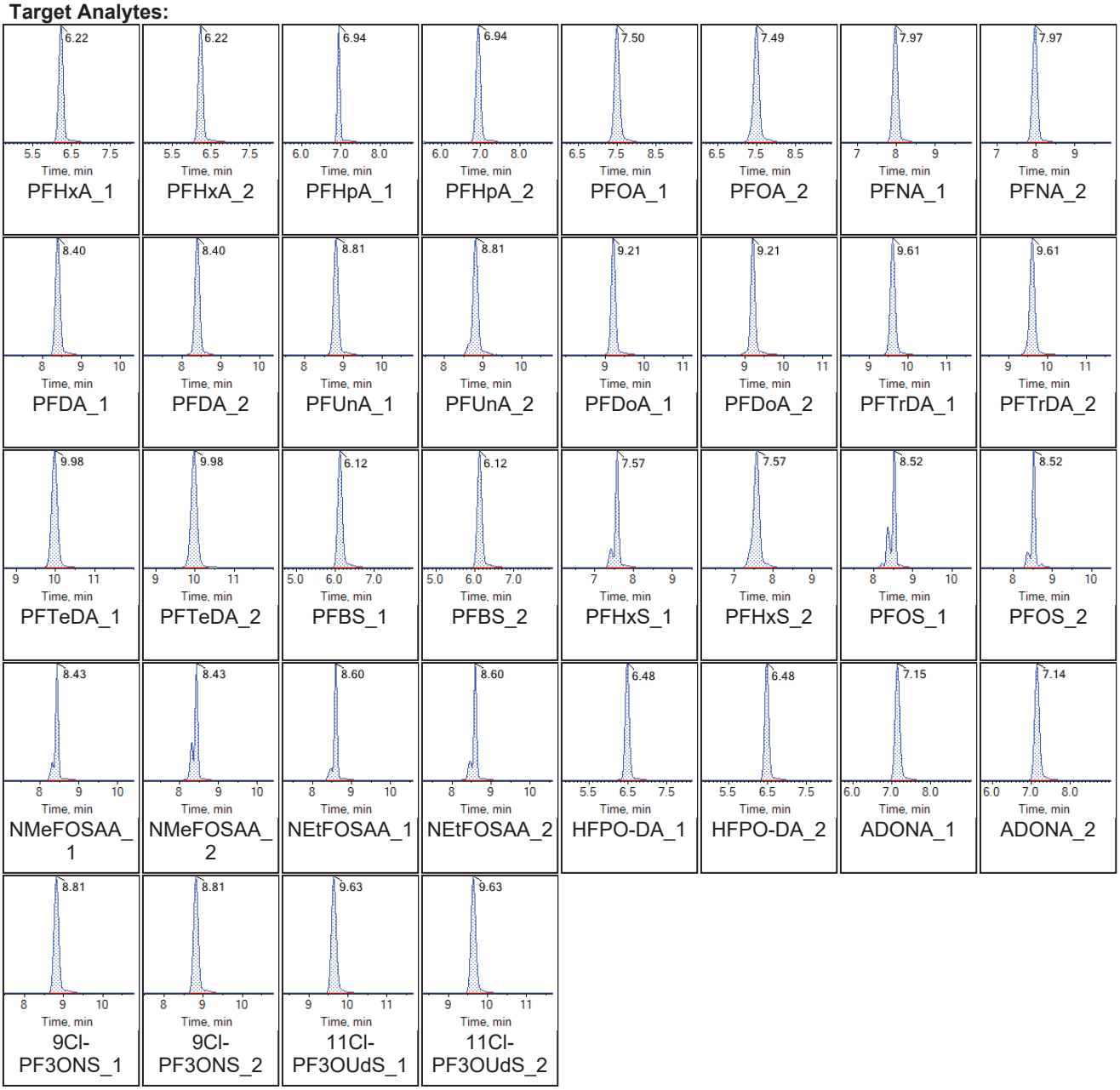
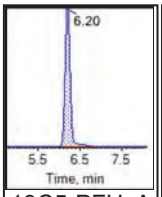
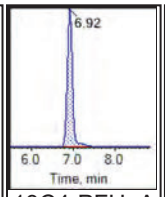


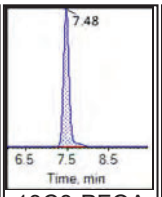
Internal Standards:



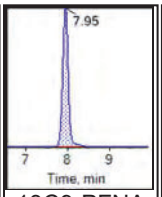
13C5-PFHxA



13C4-PFHpA



13C8-PFOA



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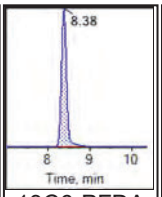
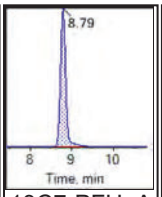
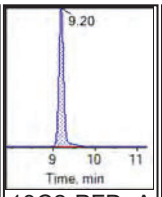


13C6-PFDA



13C7-PFUnA



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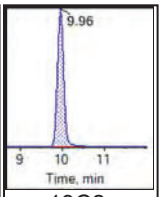
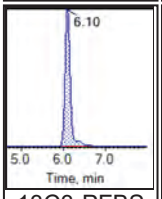
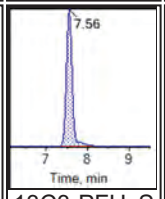


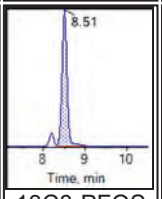
13C2-PFTeDA



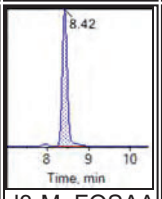
13C3-PFBS



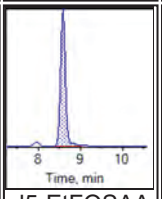
13C3-PFHxS



13C8-PFOS



d3-MeFOSAA



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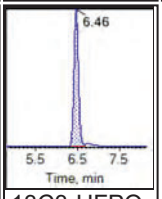

13C3-HFPO-DA

Sample Name	LZ91 IB	Injection Vial	11
Sample ID	Instrument Blank	Injection Volume	5.00
Sample Type	Unknown	Instrument Name	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 7:14:23 PM	Data File	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	Result Table	23-1034

Chromatograms

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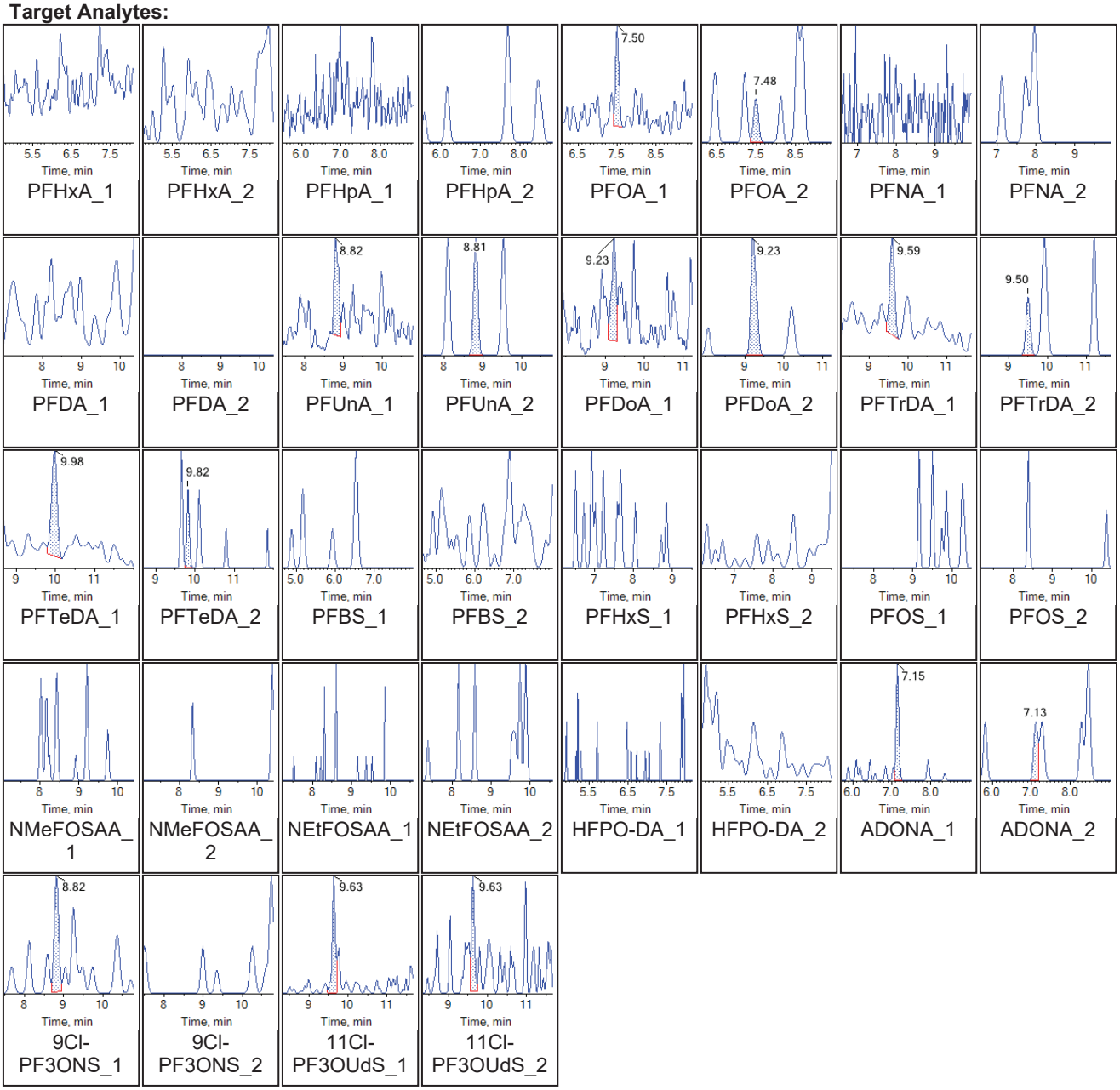
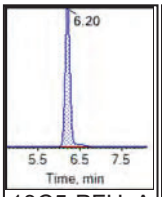
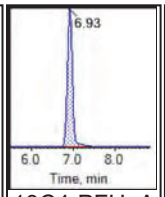


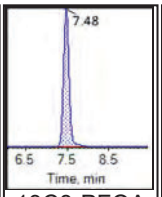
Internal Standards:



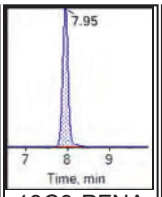
13C5-PFHxA



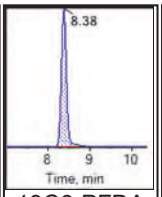
13C4-PFHpA



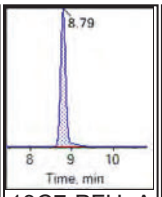
13C8-PFOA



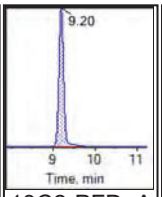
13C9-PFNA



13C6-PFDA



13C7-PFUnA



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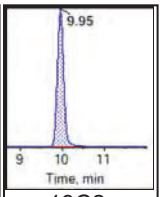
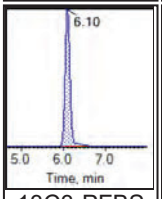
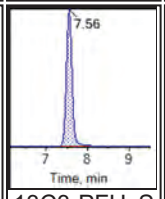


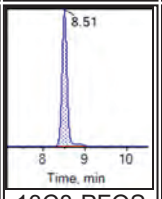
13C2-PFTeDA



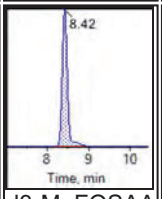
13C3-PFBS



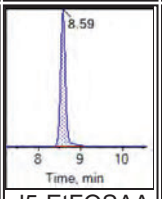
13C3-PFHxS



13C8-PFOS



d3-MeFOSAA



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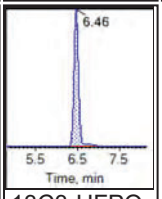
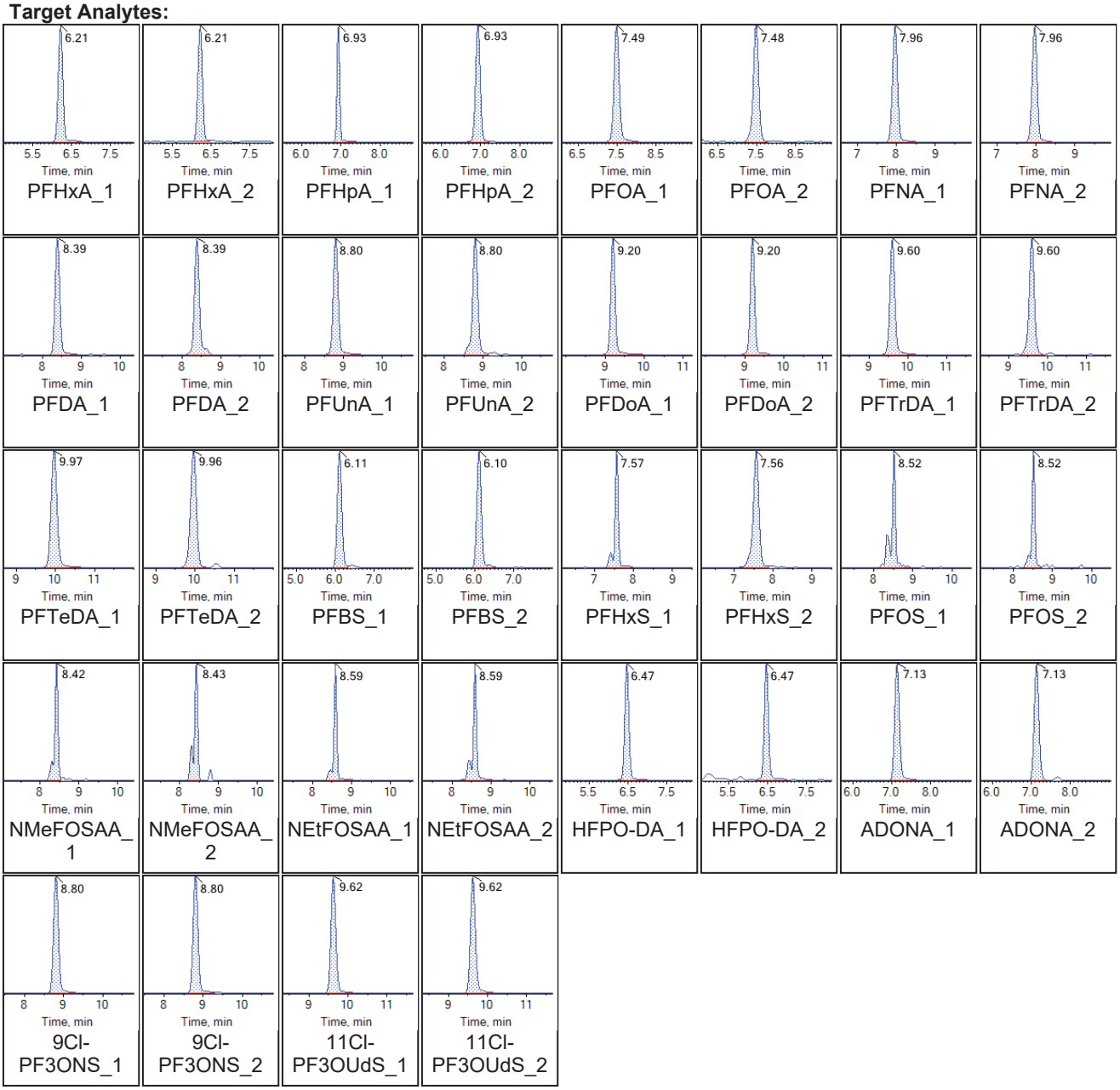


13C3-HFPO-DA

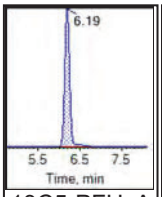
Sample Name	LZ92 ICC	**Injection Vial**	12
Sample ID	ICC	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 7:30:28 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034

Chromatograms

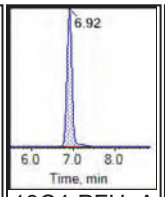
Target Analytes:



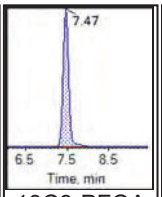
Internal Standards:



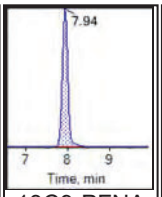
13C5-PFHxA



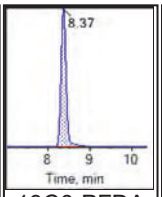
13C4-PFHpA



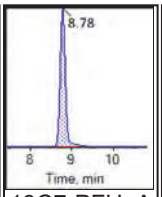
13C8-PFOA



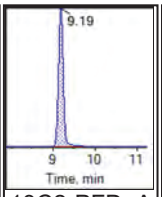
13C9-PFNA



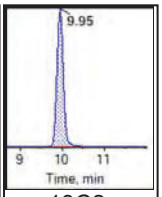
13C6-PFDA



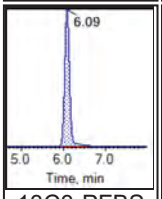
13C7-PFUnA



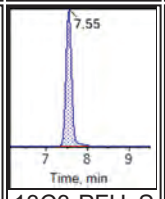
13C2-PFDoA



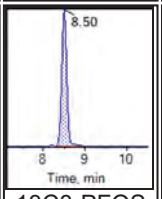
13C2-PFTeDA



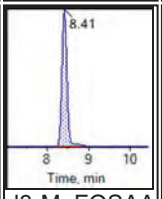
13C3-PFBS



13C3-PFHxS



13C8-PFOS



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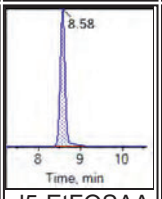
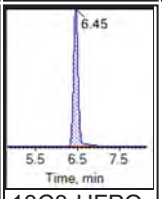


d5-EtFOSAA

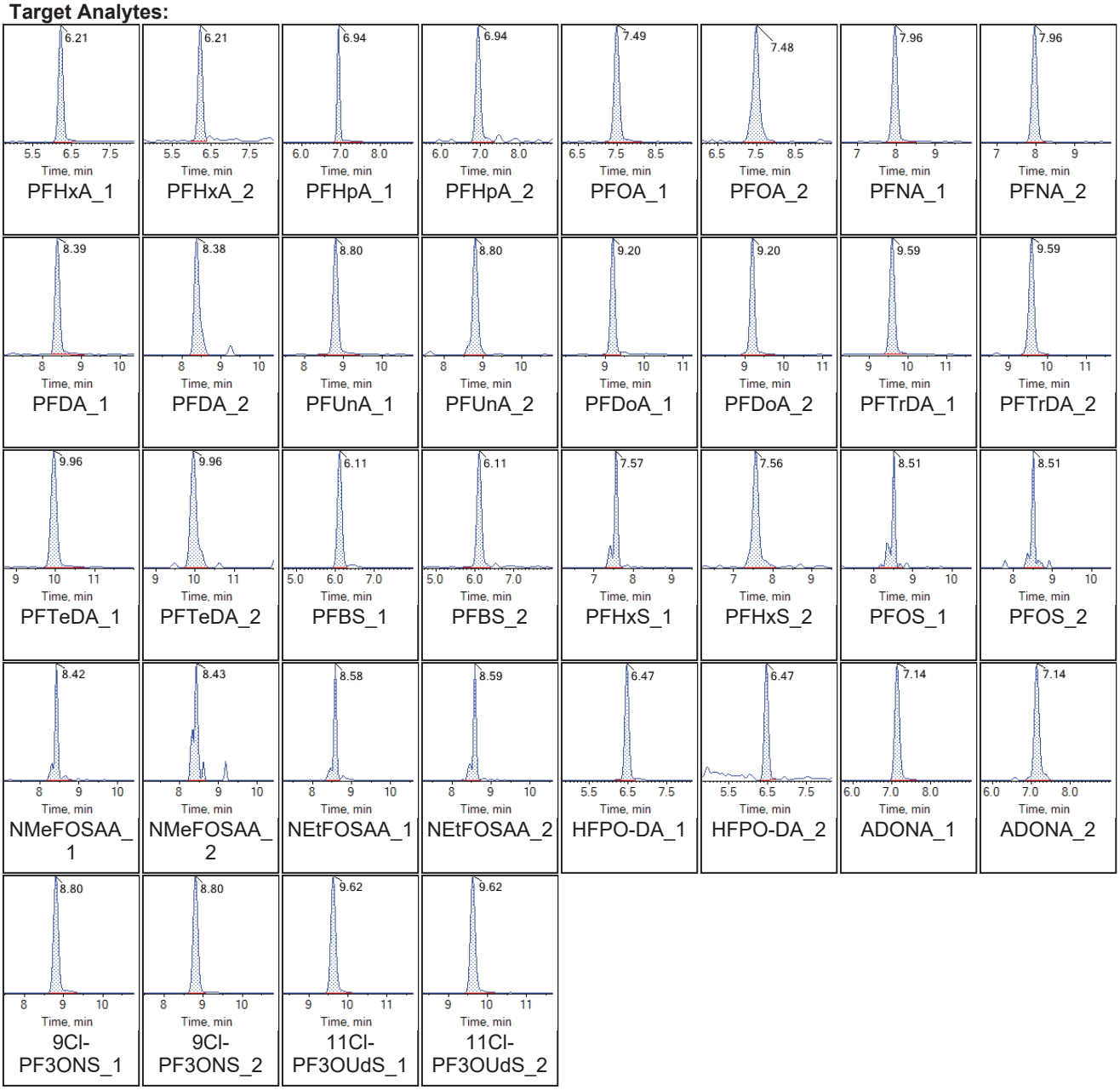


13C3-HFPO-DA

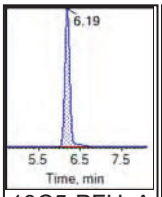
Sample Name	LZ86 CCV	**Injection Vial**	23
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 10:27:16 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034

Chromatograms

Target Analytes:



Internal Standards:



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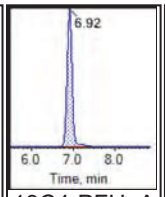
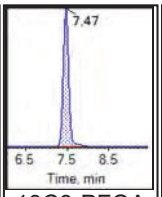
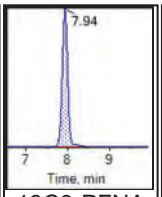


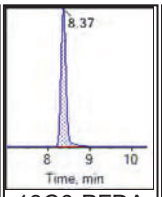
13C4-PFHpA



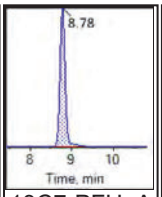
13C8-PFOA



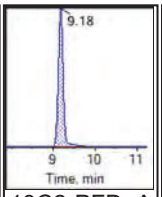
13C9-PFNA



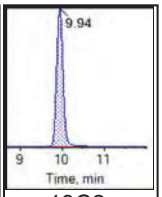
13C6-PFDA



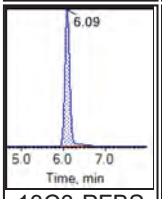
13C7-PFUnA



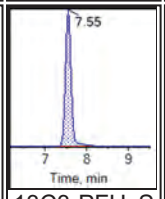
13C2-PFDoA



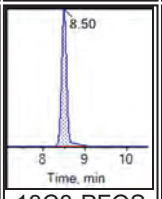
13C2-PFTeDA



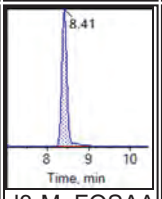
13C3-PFBS



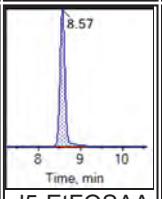
13C3-PFHxS



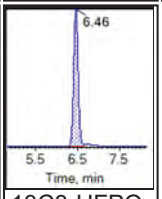
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA



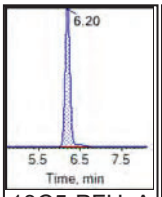
13C3-HFPO-DA

Sample Name	DO701PB-FS(0)	**Injection Vial**	24
Sample ID	Procedural Blank	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 10:43:21 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034

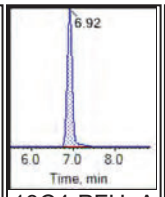
Chromatograms

Target Analytes:

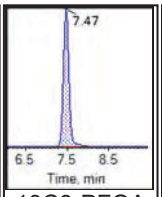
Internal Standards:



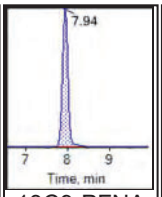
13C5-PFHxA



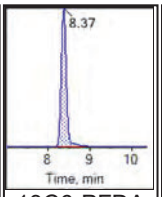
13C4-PFHpA



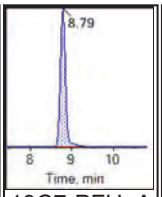
13C8-PFOA



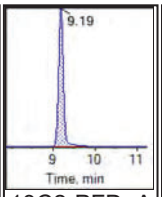
13C9-PFNA



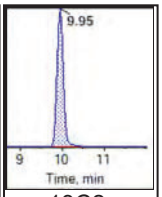
13C6-PFDA



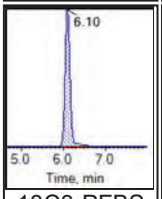
13C7-PFUnA



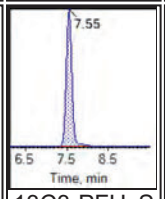
13C2-PFDoA



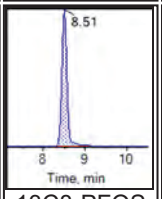
13C2-PFTeDA



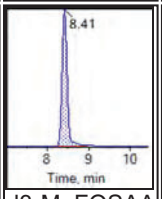
13C3-PFBS



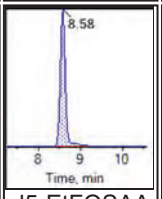
13C3-PFHxS



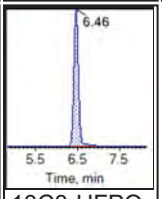
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA

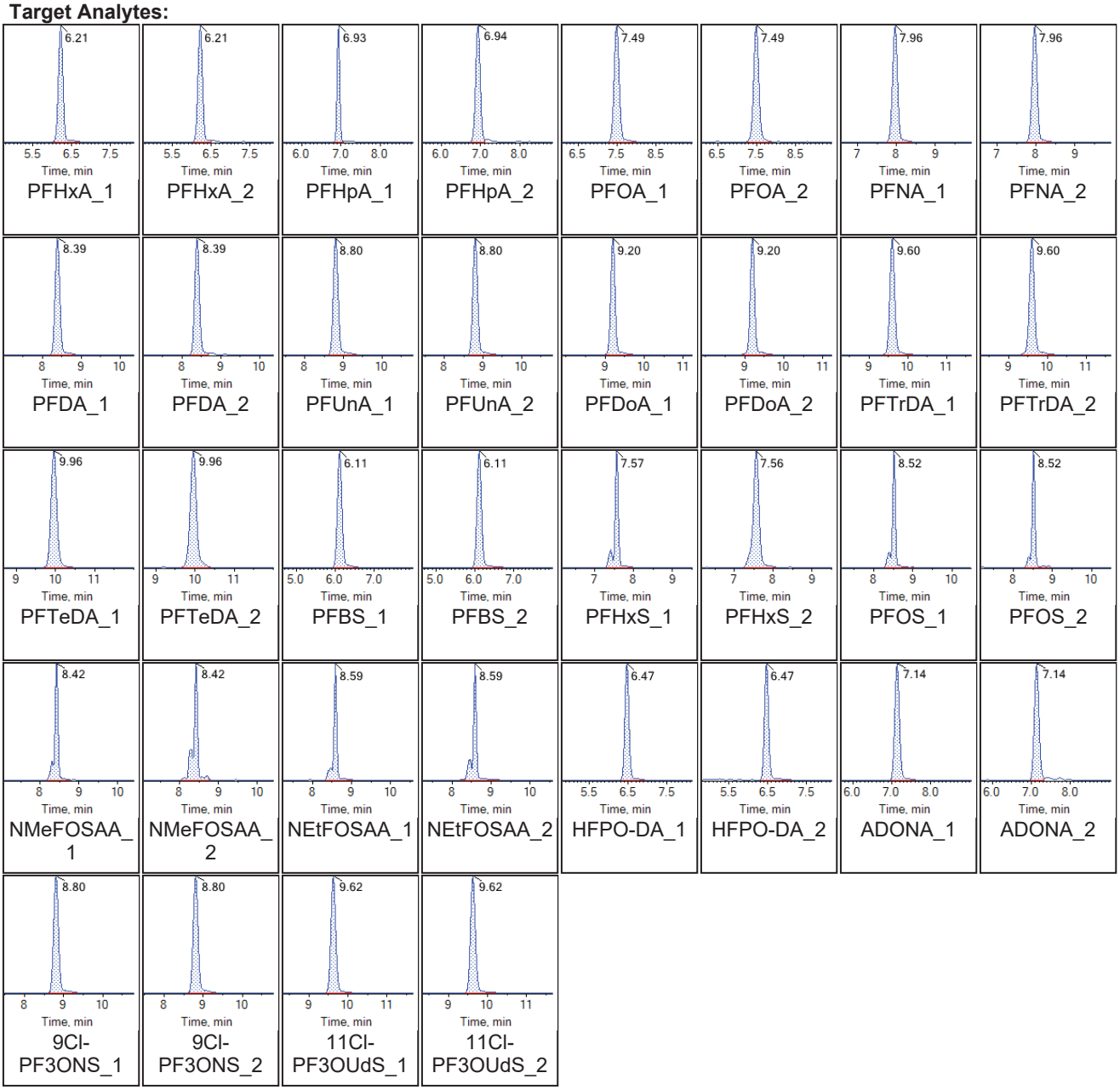


13C3-HFPO-DA

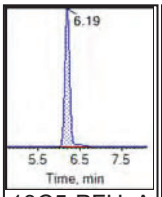
Sample Name	DO702LCS-FS(0)	**Injection Vial**	25
Sample ID	Laboratory Control Sample	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 10:59:25 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034

Chromatograms

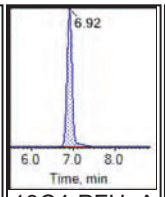
Target Analytes:



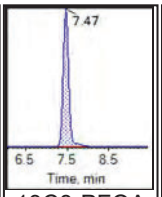
Internal Standards:



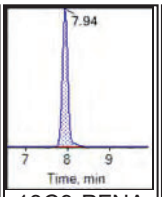
13C5-PFHxA



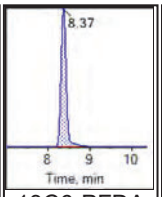
13C4-PFHpA



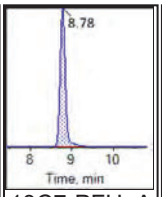
13C8-PFOA



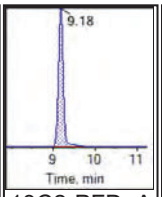
13C9-PFNA



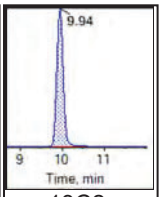
13C6-PFDA



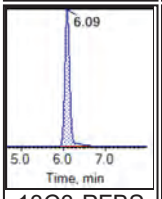
13C7-PFUnA



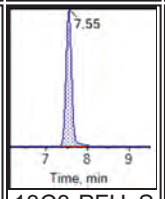
13C2-PFDoA



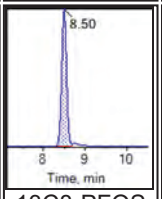
13C2-PFTeDA



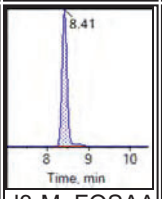
13C3-PFBS



13C3-PFHxS



13C8-PFOS



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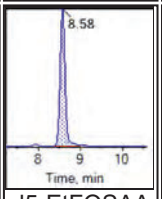
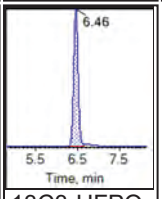


d5-EtFOSAA

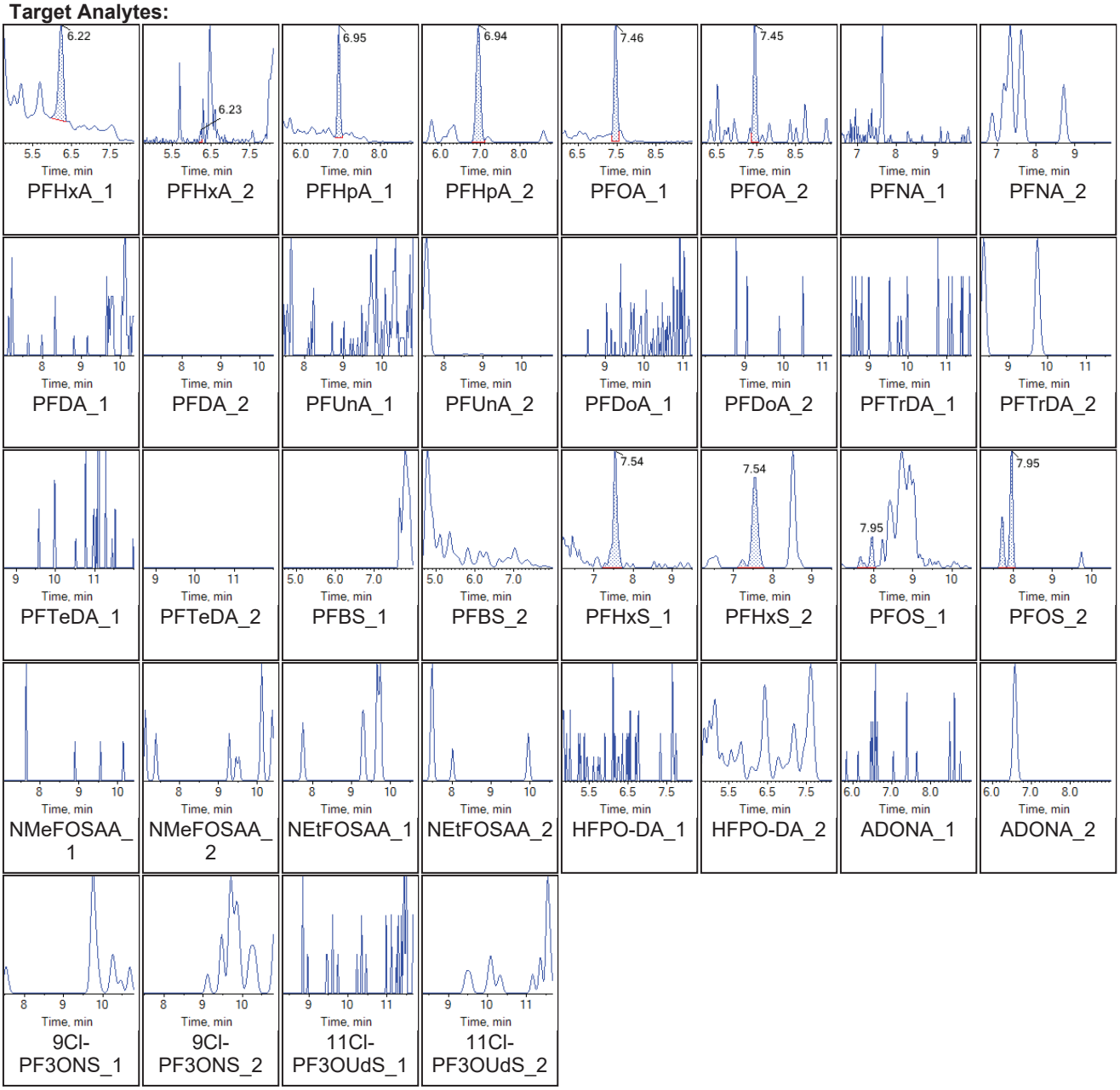


13C3-HFPO-DA

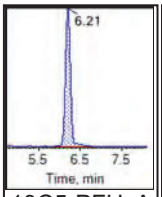
Sample Name	D7902-FS(0)	**Injection Vial**	26
Sample ID	NBKK-B76-IDW01-AQ-081623	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 11:15:29 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034

Chromatograms

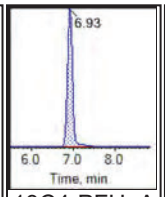
Target Analytes:



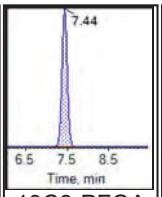
Internal Standards:



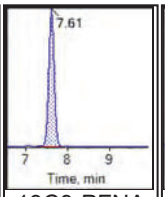
13C5-PFHxA



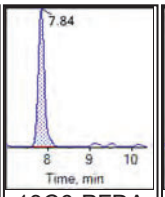
13C4-PFHpA



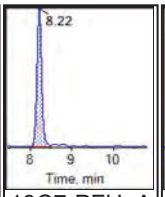
13C8-PFOA



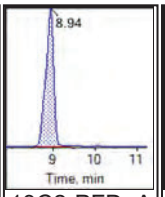
13C9-PFNA



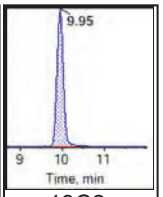
13C6-PFDA



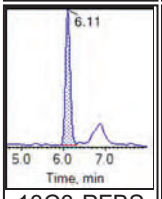
13C7-PFUnA



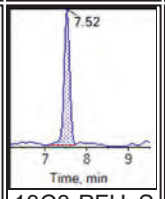
13C2-PFDoA



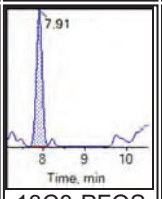
13C2-PFTeDA



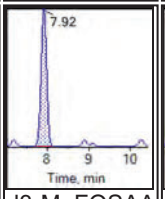
13C3-PFBS



13C3-PFHxS



13C8-PFOS



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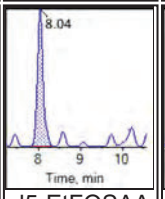

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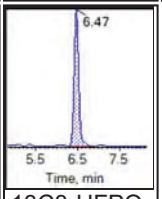

13C3-HFPO-DA

Sample Name	D7903-FS(0)	**Injection Vial**	27
Sample ID	NBKK-B76-IDW02-AQ-081623	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 11:31:33 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034

Chromatograms

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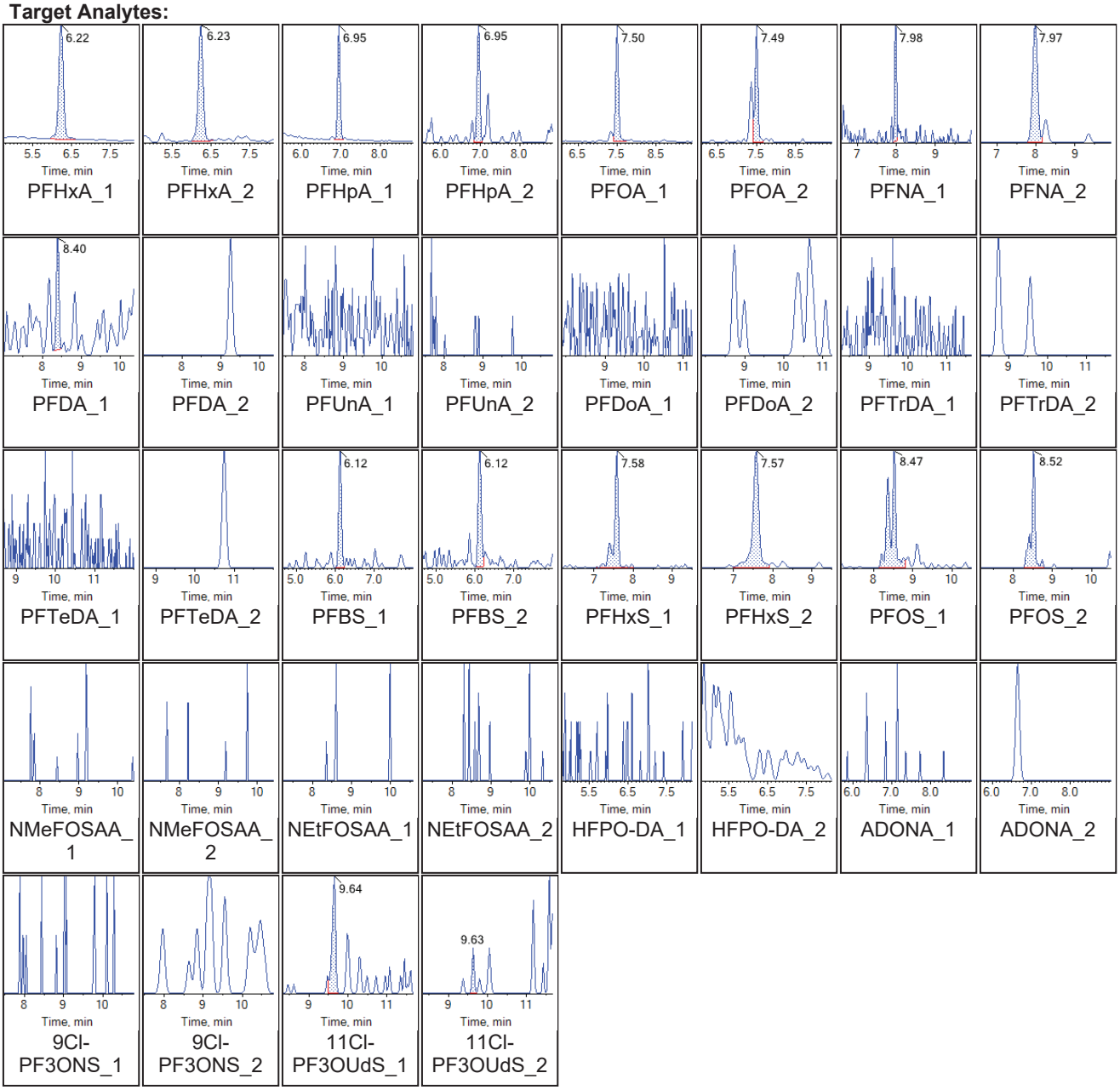
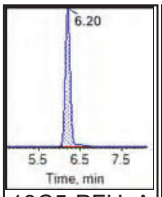
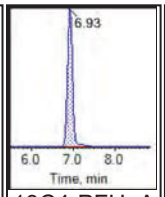


Internal Standards:



13C5-PFHxA



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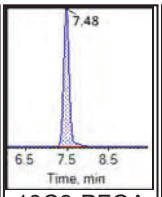

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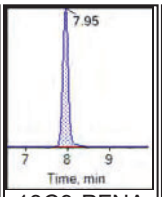
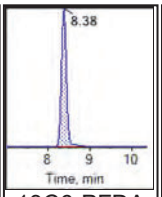


13C9-PFNA



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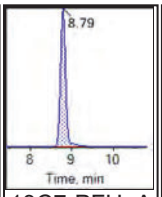

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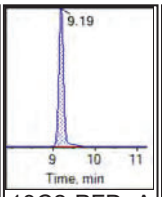

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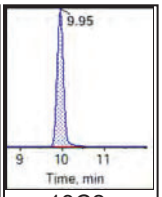
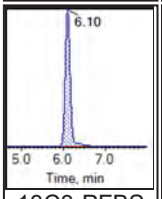
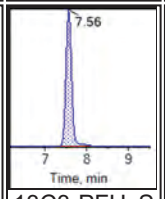


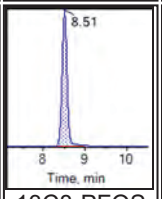
13C2-PFTeDA



13C3-PFBS



13C3-PFHxS



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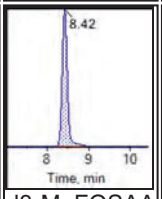
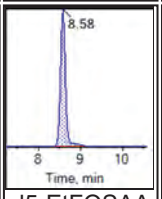


d3-MeFOSAA



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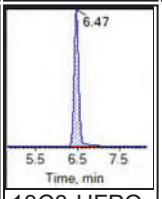

13C3-HFPO-DA

Sample Name	LZ87 CCV	**Injection Vial**	29
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 12:03:44 AM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034

Chromatograms

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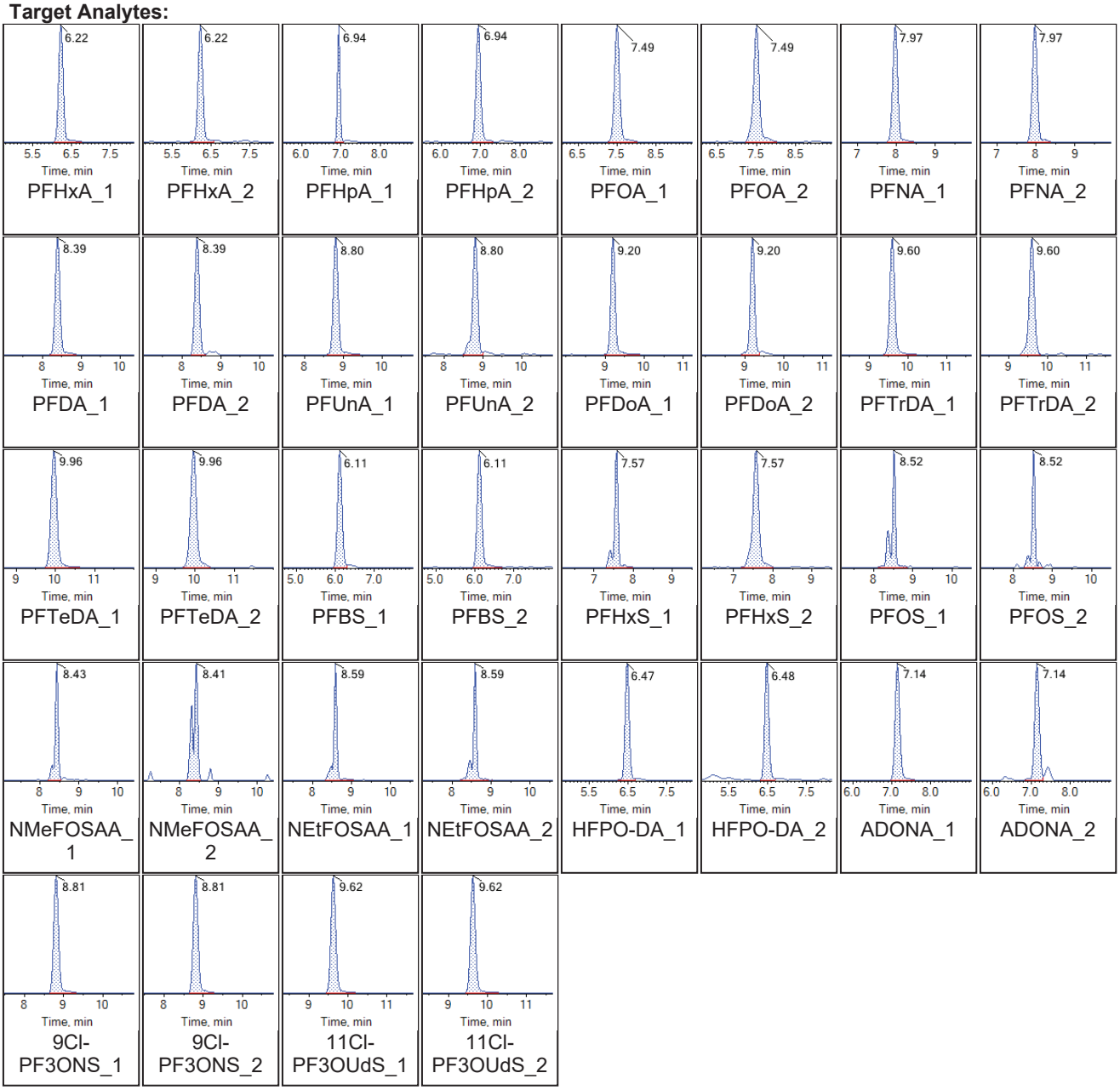
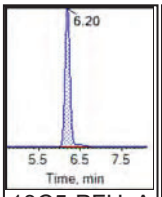
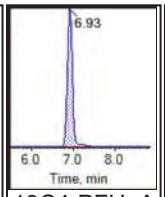


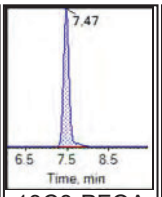
Internal Standards:



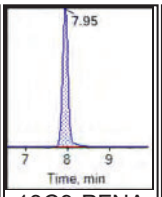
13C5-PFHxA



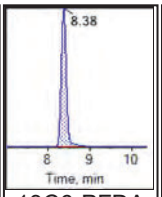
13C4-PFHpA



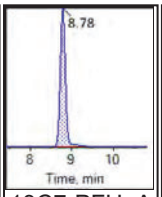
13C8-PFOA



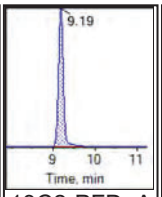
13C9-PFNA



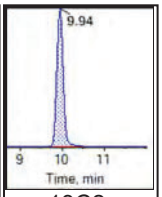
13C6-PFDA



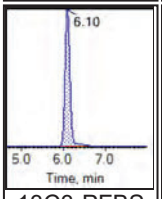
13C7-PFUnA



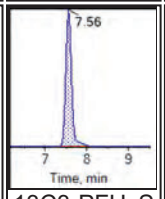
13C2-PFDoA



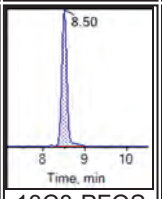
13C2-PFTeDA



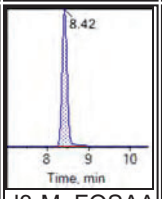
13C3-PFBS



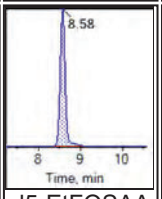
13C3-PFHxS



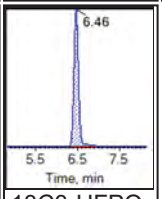
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA

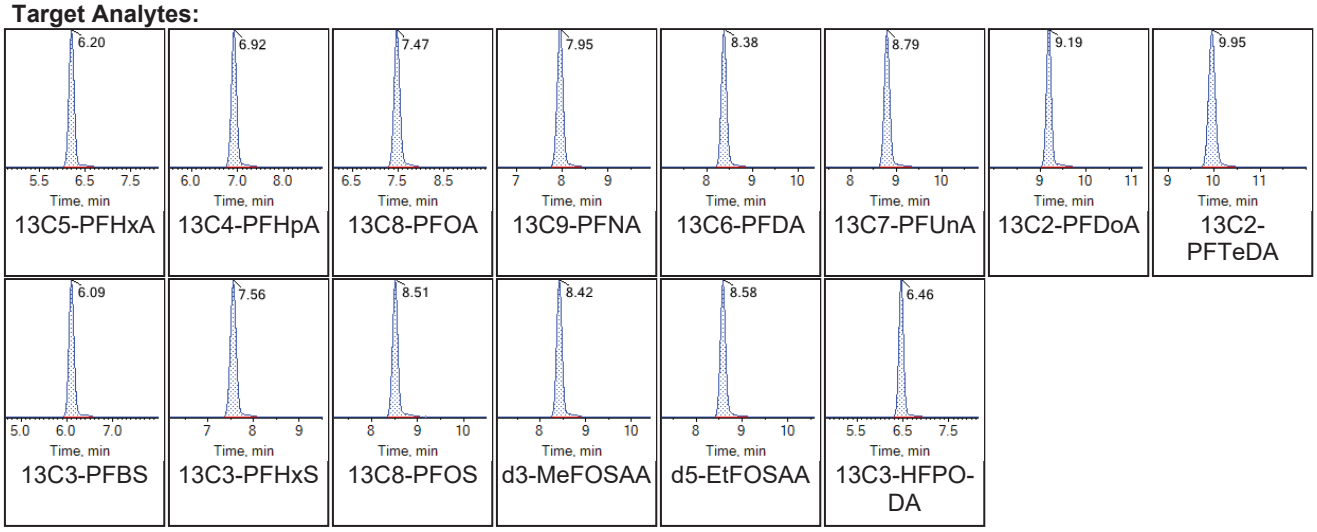


13C3-HFPO-DA

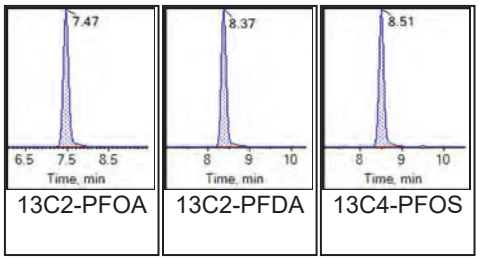
Sample Name	LZ83	**Injection Vial**	3
Sample ID	L1	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:05:55 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS

Chromatograms

Target Analytes:



Internal Standards:



Sample Name	LZ84	**Injection Vial**	4
Sample ID	L2	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:21:58 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS

Chromatograms

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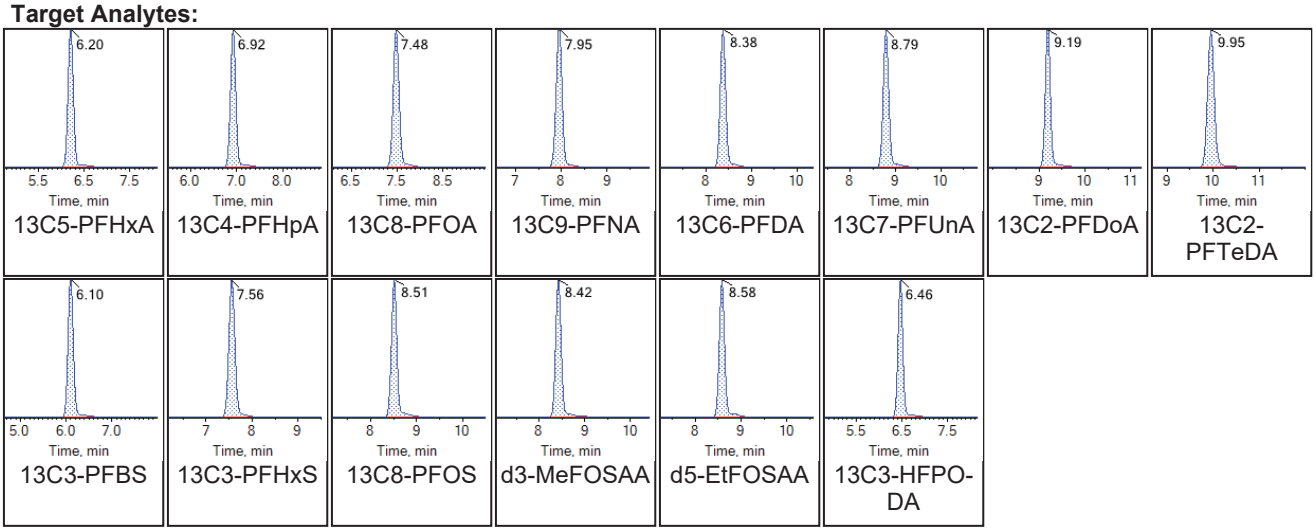
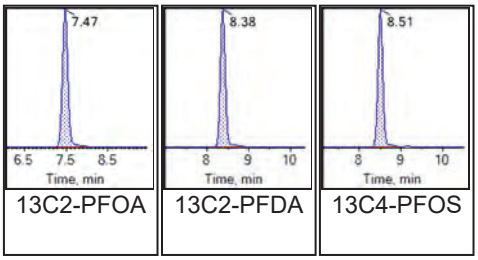


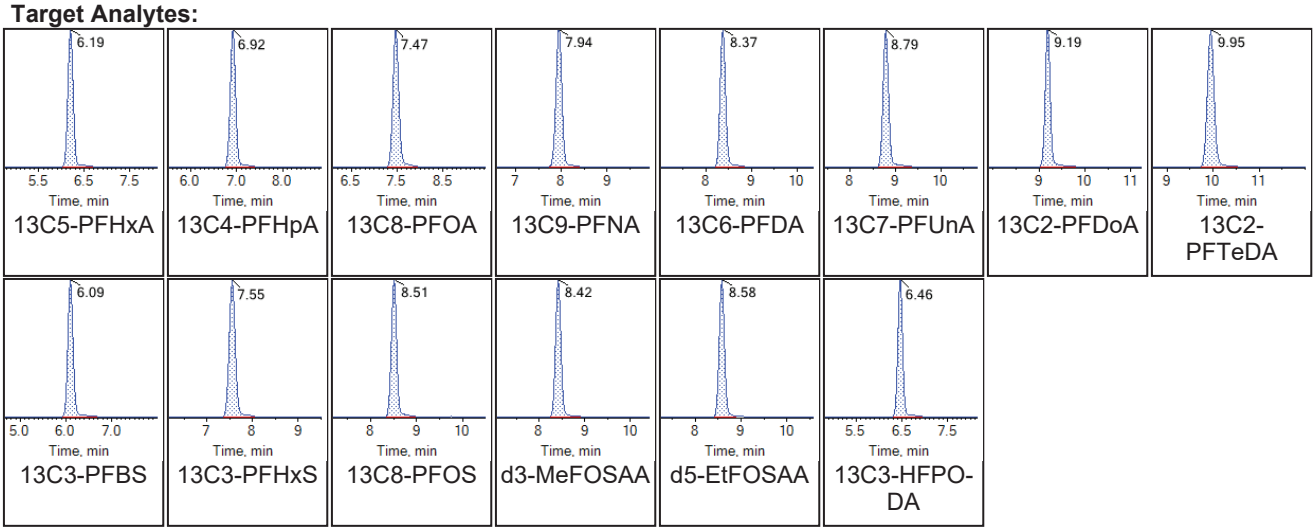
Internal Standards:



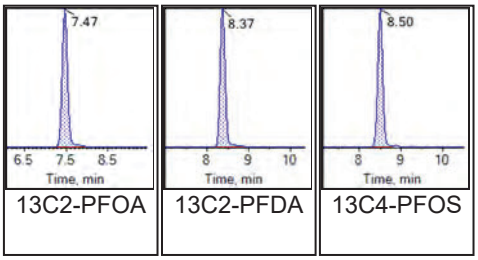
Sample Name	LZ85	**Injection Vial**	5
Sample ID	L3	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:38:02 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS

Chromatograms

Target Analytes:



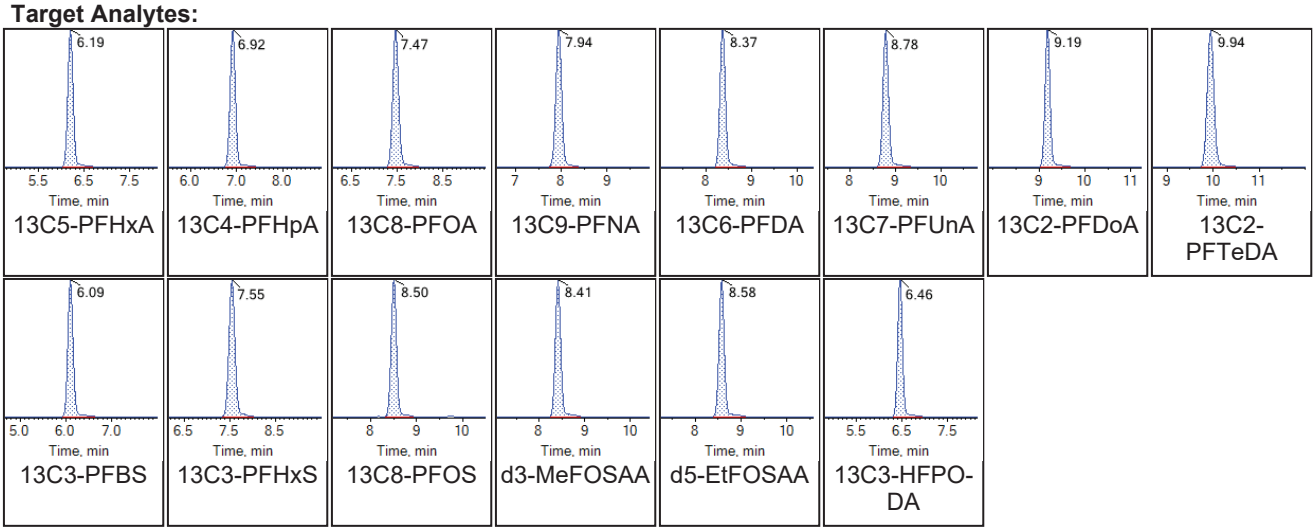
Internal Standards:



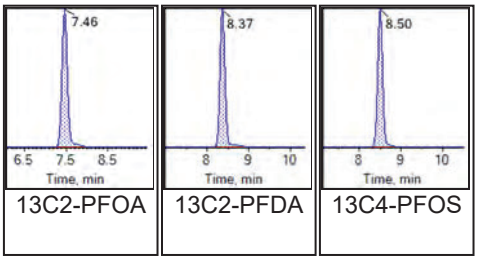
Sample Name	LZ86	**Injection Vial**	6
Sample ID	L4	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 5:54:06 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS

Chromatograms

Target Analytes:



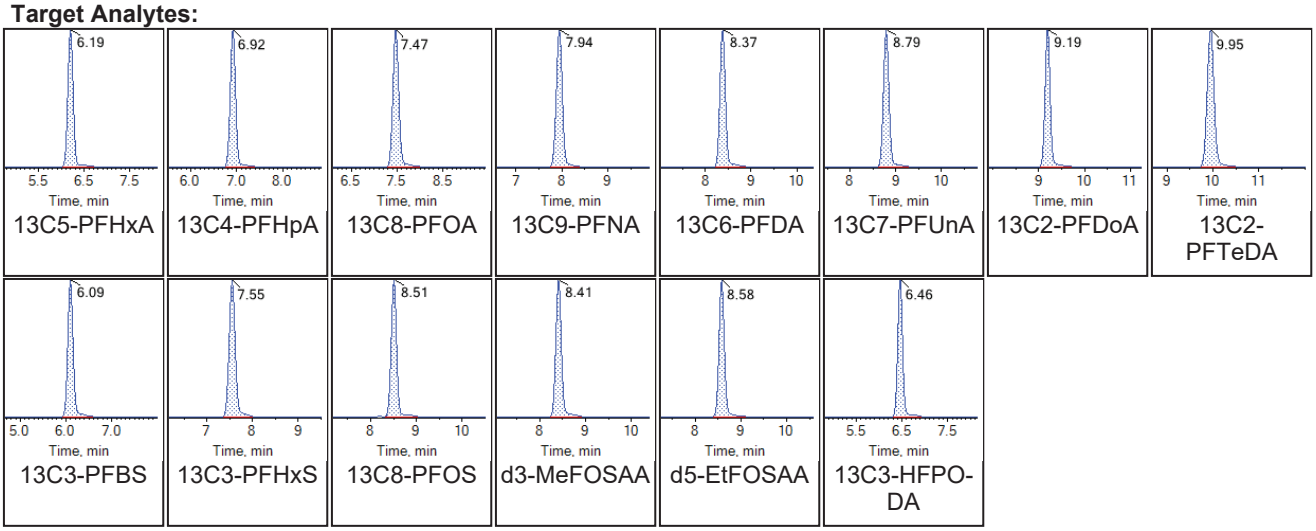
Internal Standards:



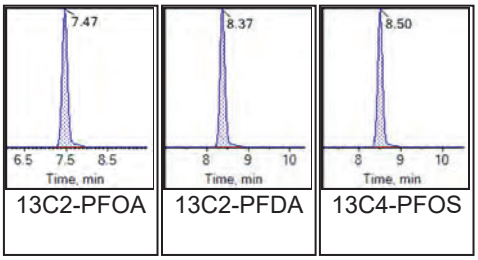
Sample Name	LZ87	**Injection Vial**	7
Sample ID	L5	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:10:10 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS

Chromatograms

Target Analytes:



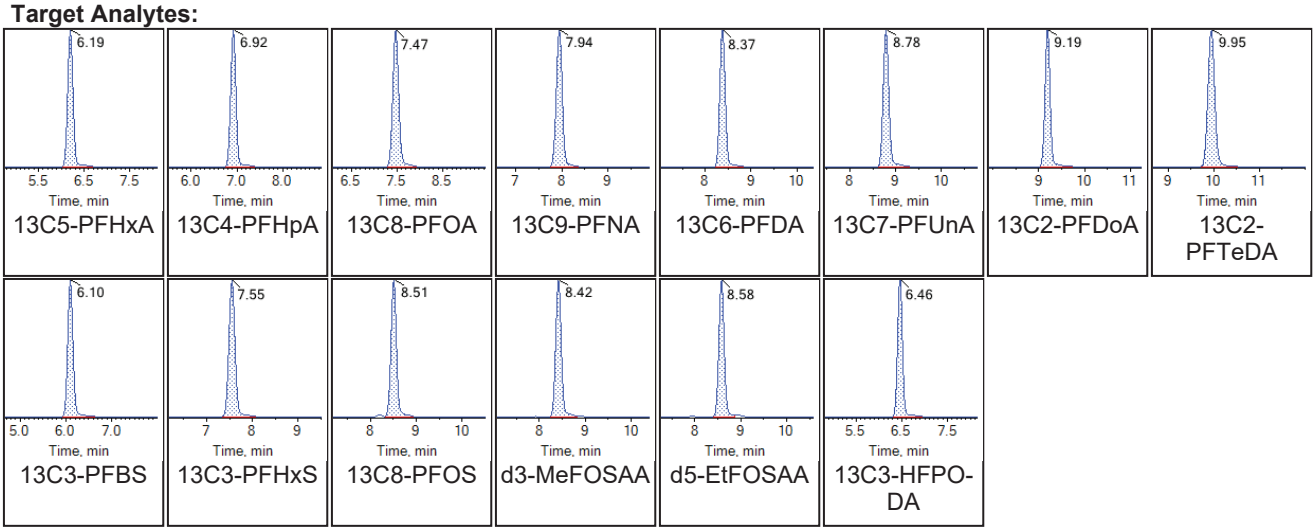
Internal Standards:



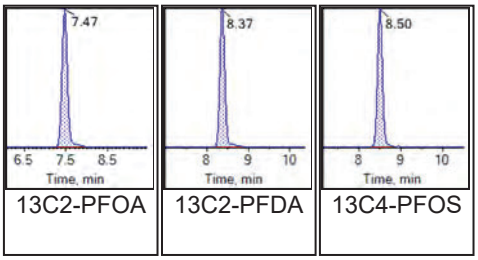
Sample Name	LZ88	**Injection Vial**	8
Sample ID	L6	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:26:12 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS

Chromatograms

Target Analytes:



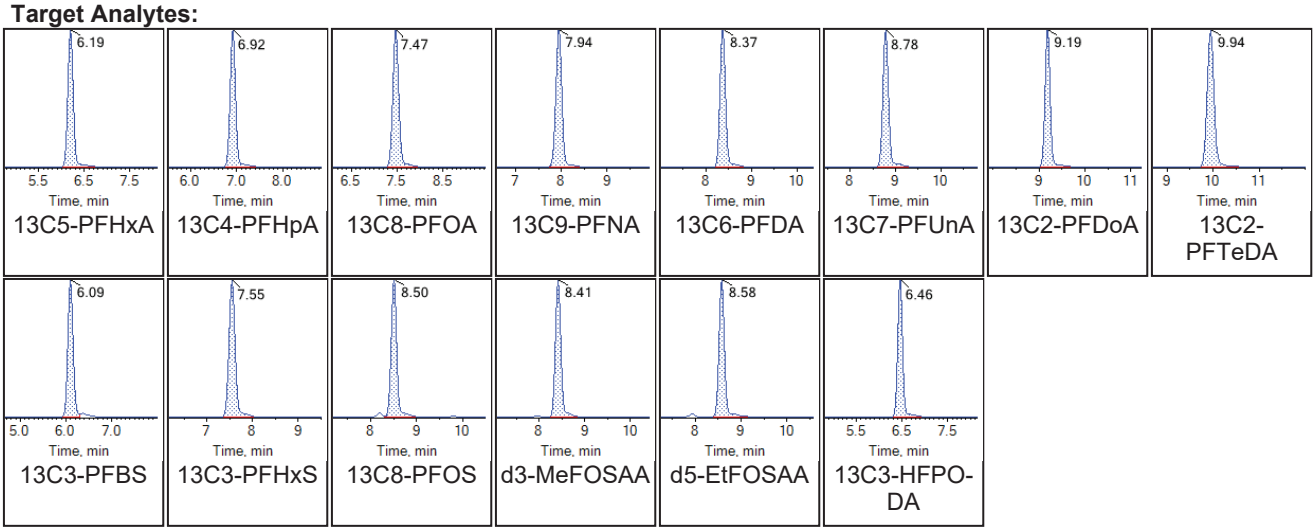
Internal Standards:



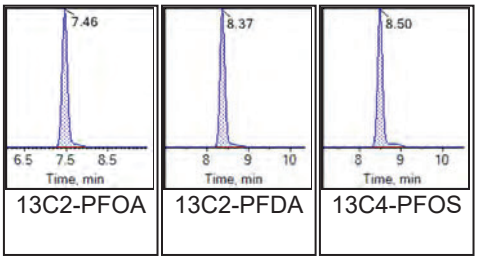
Sample Name	LZ89	**Injection Vial**	9
Sample ID	L7	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:42:16 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS

Chromatograms

Target Analytes:



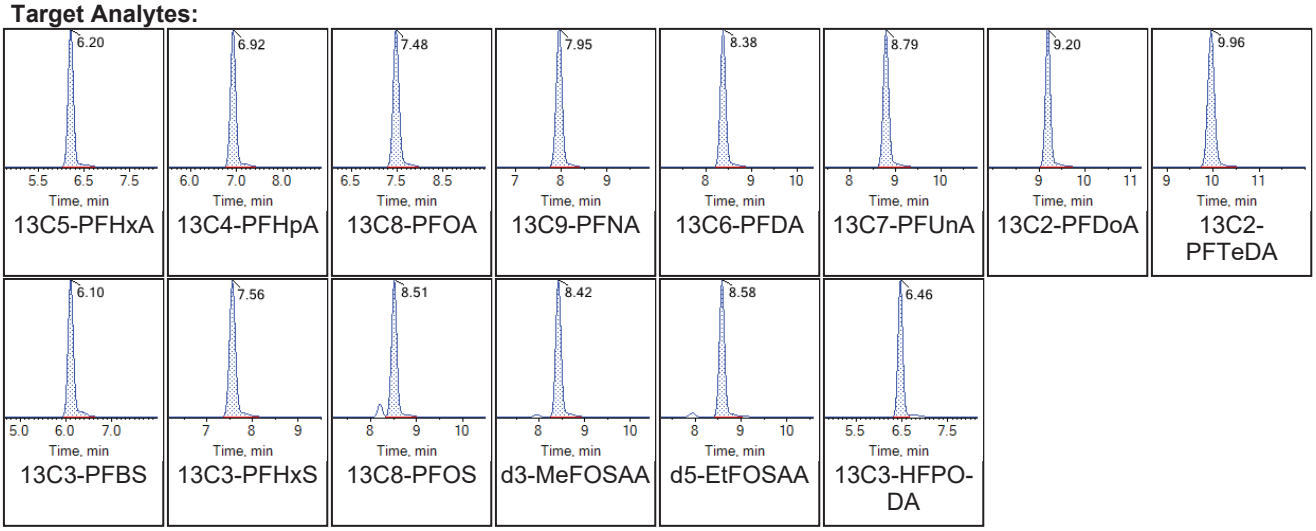
Internal Standards:



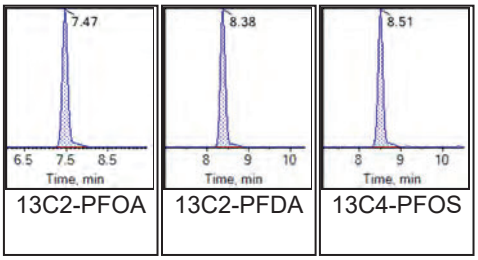
Sample Name	LZ90	**Injection Vial**	10
Sample ID	L8	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:58:19 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS

Chromatograms

Target Analytes:



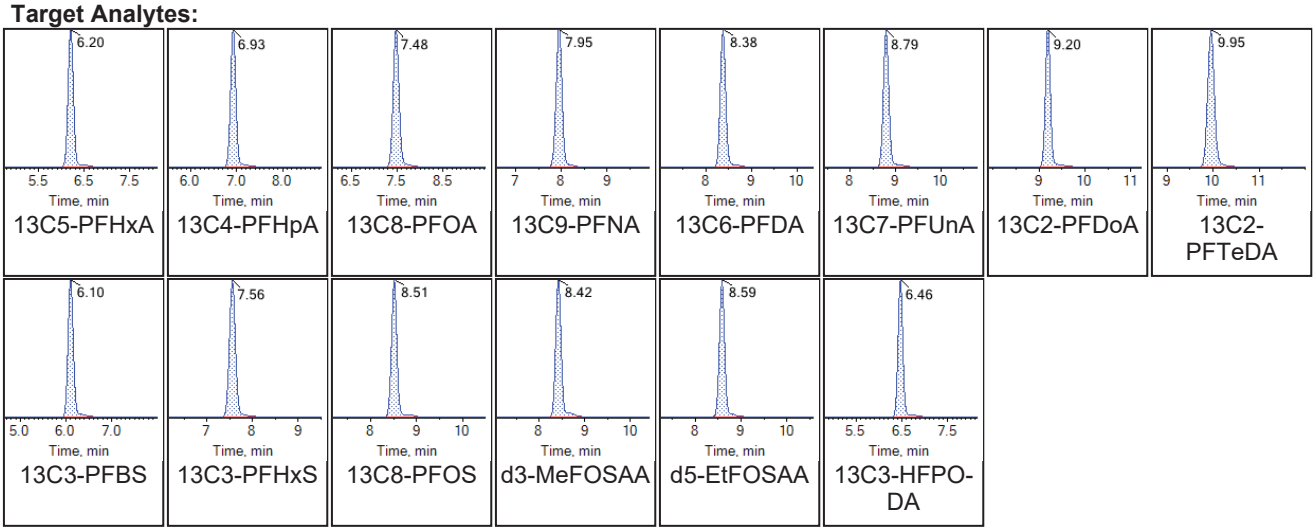
Internal Standards:



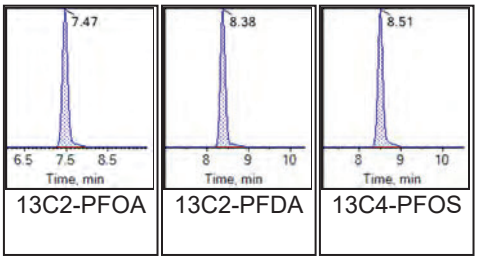
Sample Name	LZ91 IB	**Injection Vial**	11
Sample ID	Instrument Blank	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 7:14:23 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS

Chromatograms

Target Analytes:



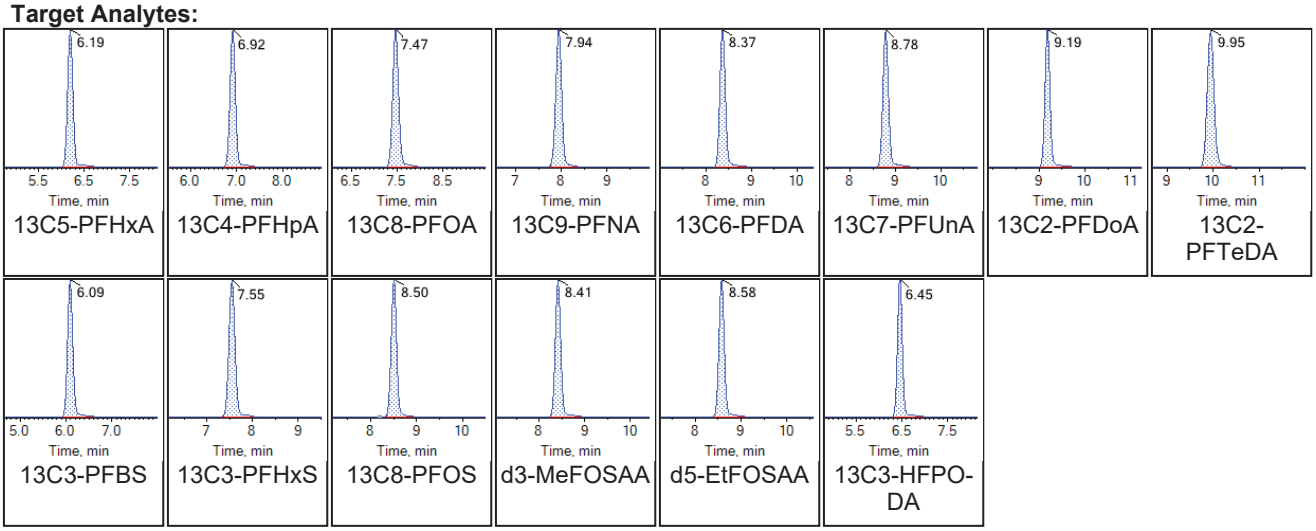
Internal Standards:



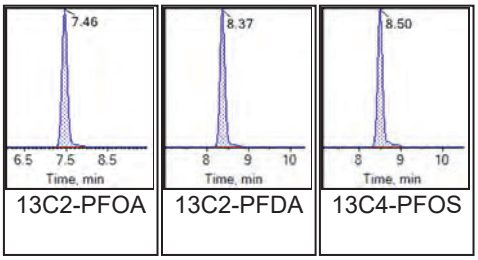
Sample Name	LZ92 ICC	**Injection Vial**	12
Sample ID	ICC	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 7:30:28 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS

Chromatograms

Target Analytes:



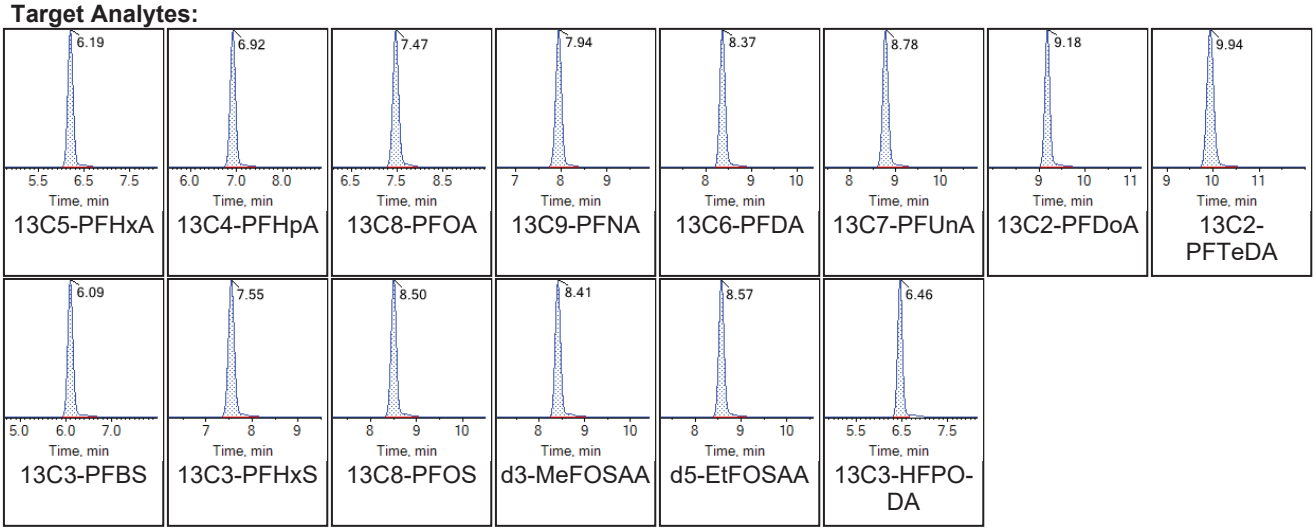
Internal Standards:



Sample Name	LZ86 CCV	**Injection Vial**	23
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 10:27:16 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS

Chromatograms

Target Analytes:



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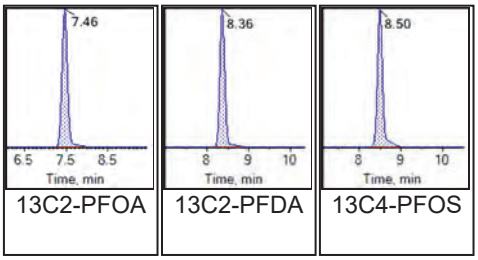
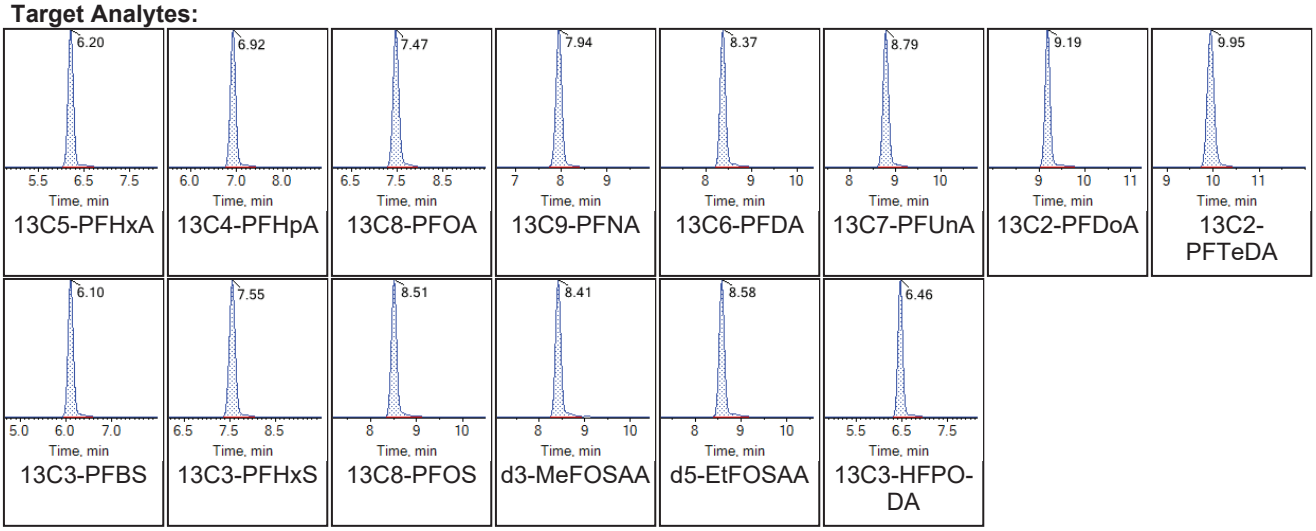


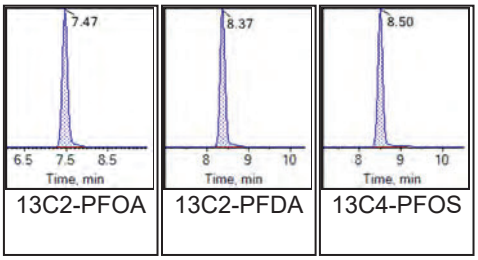
Sample Name	DO701PB-FS(0)	**Injection Vial**	24
Sample ID	Procedural Blank	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 10:43:21 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS

Chromatograms

Target Analytes:



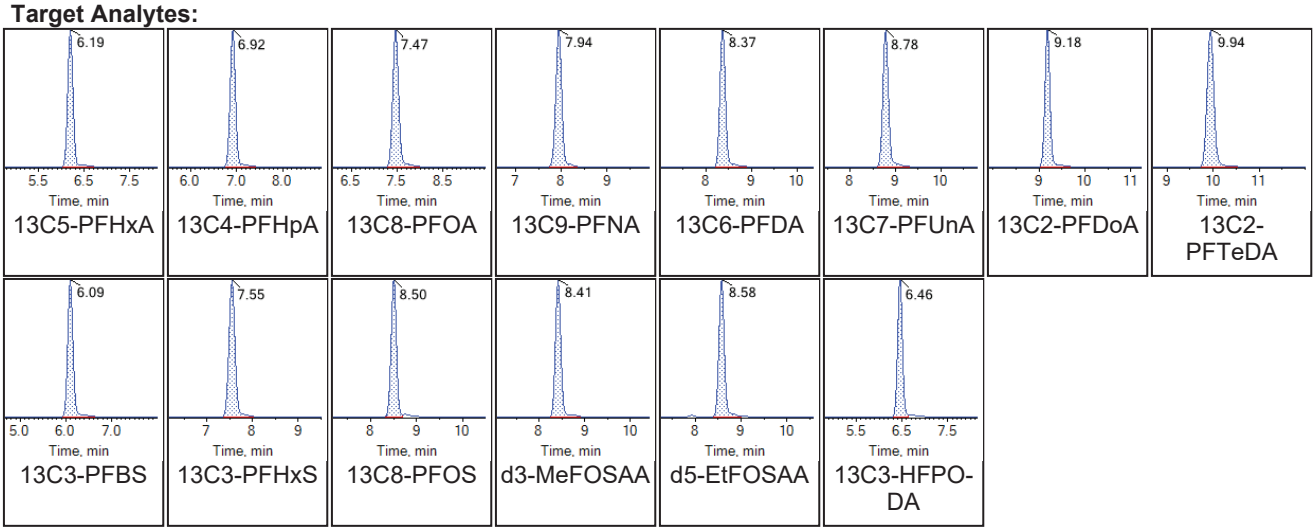
Internal Standards:



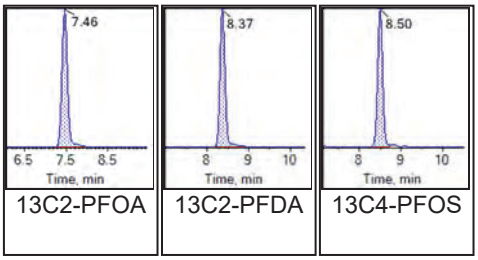
Sample Name	DO702LCS-FS(0)	**Injection Vial**	25
Sample ID	Laboratory Control Sample	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 10:59:25 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS

Chromatograms

Target Analytes:



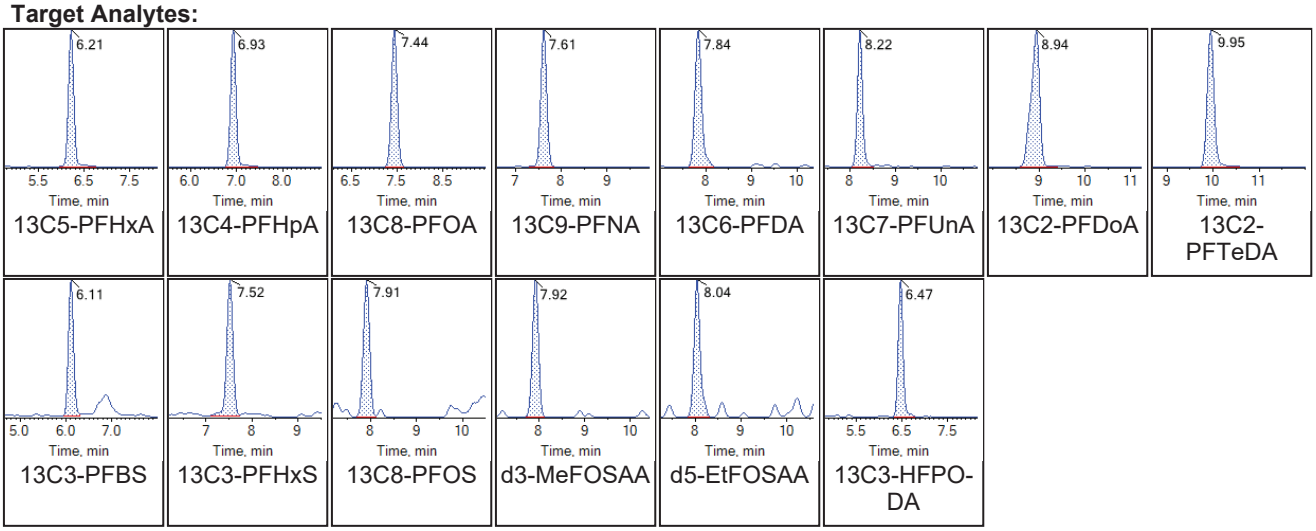
Internal Standards:



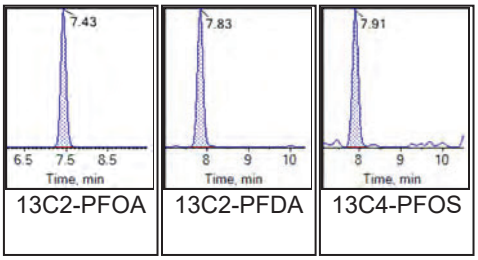
Sample Name	D7902-FS(0)	**Injection Vial**	26
Sample ID	NBKK-B76-IDW01-AQ-081623	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 11:15:29 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS

Chromatograms

Target Analytes:



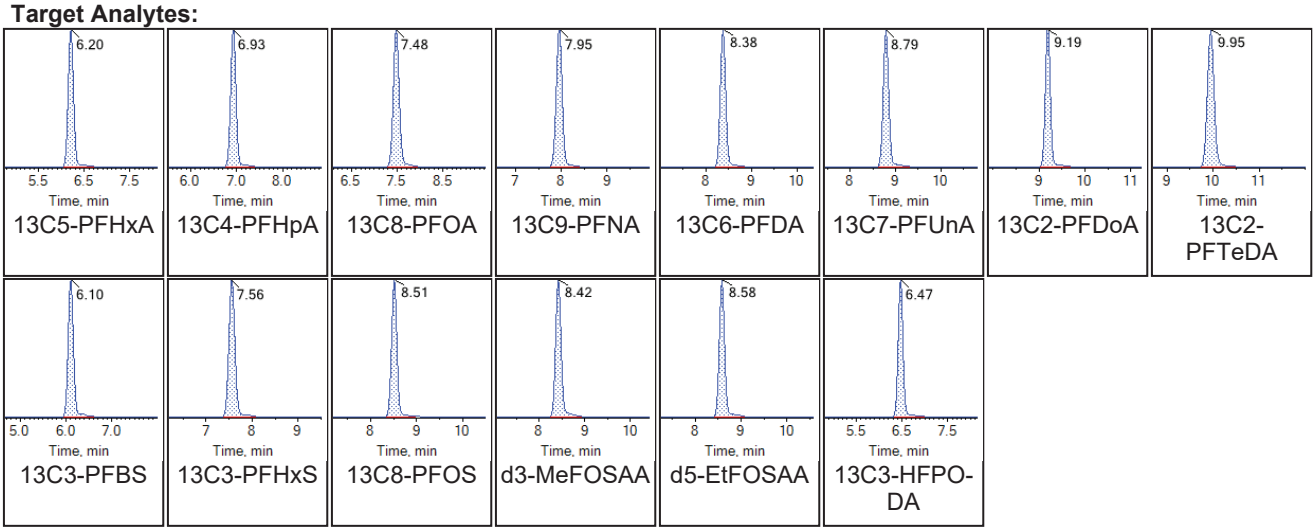
Internal Standards:



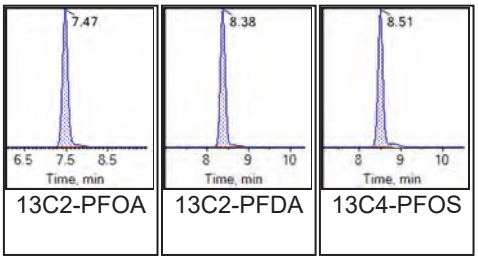
Sample Name	D7903-FS(0)	**Injection Vial**	27
Sample ID	NBKK-B76-IDW02-AQ-081623	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 11:31:33 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS

Chromatograms

Target Analytes:



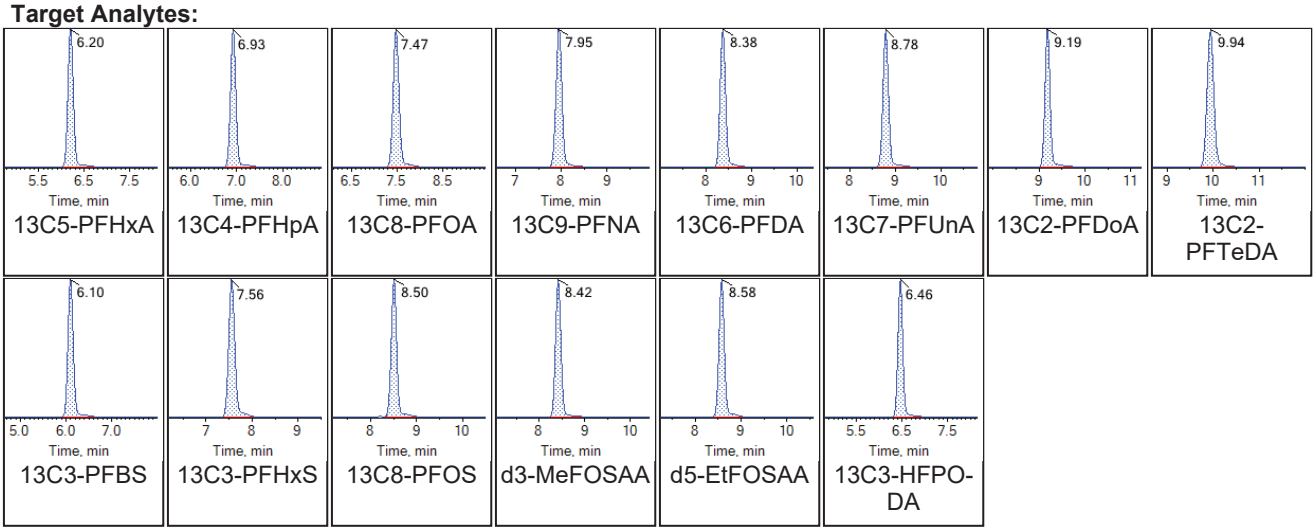
Internal Standards:



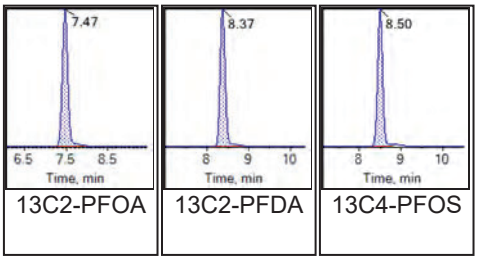
Sample Name	LZ87 CCV	**Injection Vial**	29
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 12:03:44 AM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS

Chromatograms

Target Analytes:



Internal Standards:



Unused Data

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PFAS Sample Quant Report

Created with Analyst Reporter
Printed: 23/08/2023 10:08:50 AM

Sample Name	D7902-FS(0)	**Injection Vial**	14
Sample ID	NBKK-B76-IDW01-AQ-081623	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 8:38:01 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_Unused
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.49	152319.45	7.921	1926.5	7.65	13C2-PFOA	465891.83	25.000				
13C4-PFHpA	367.1 / 322.0	7.20	233584.65	7.419	1214.8	7.65	13C2-PFOA	465891.83	25.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.66	99454.67	4.024	15000.7	7.65	13C2-PFOA	465891.83	25.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	7.74	32613.32	2.802	13440.4	7.65	13C2-PFOA	465891.83	25.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	7.97	10753.90	5.382	352.9	7.96	13C2-PFDA	37737.29	25.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	8.32	40569.34	13.064	6071.7	7.96	13C2-PFDA	37737.29	25.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.44	67438.57	31.112	3643.9	7.96	13C2-PFDA	37737.29	25.000		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.05	3567.72	5.004	5283.6	8.06	13C4-PFOS	7411.41	23.950		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.03	2278.73	0.745	3824.8	7.65	13C2-PFOA	465891.83	25.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.10	5305.07	1.728	803.9	7.65	13C2-PFOA	465891.83	25.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.76	28249.30	6.841	1658.1	7.65	13C2-PFOA	465891.83	25.000		N/A	N/A	✓

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PFAS Sample Quant Report

Created with Analyst Reporter
Printed: 23/08/2023 10:08:50 AM

Sample Name	D7903-FS(0)	**Injection Vial**	15
Sample ID	NBKK-B76-IDW02-AQ-081623	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 8:54:05 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_Unused
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.50	2087446.53	39.551	5690.6	7.78	13C2-PFOA	1278612.94	25.000				
13C4-PFHpA	367.1 / 322.0	7.22	2896844.19	33.525	6986.9	7.78	13C2-PFOA	1278612.94	25.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.78	1277436.36	18.834	9487.5	7.78	13C2-PFOA	1278612.94	25.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	8.28	885524.15	27.720	11278.4	7.78	13C2-PFOA	1278612.94	25.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.75	1294997.55	22.815	3942.7	8.74	13C2-PFDA	1071924.12	25.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	9.21	2213271.31	25.090	4536.5	8.74	13C2-PFDA	1071924.12	25.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.50	635519.17	10.322	5193.5	8.74	13C2-PFDA	1071924.12	25.000		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.93	153416.82	20.617	1545.8	8.93	13C4-PFOS	77350.70	23.950		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.76	307783.96	36.655	1665.5	7.78	13C2-PFOA	1278612.94	25.000		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.94	284424.07	33.756	2435.0	7.78	13C2-PFOA	1278612.94	25.000		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.77	397941.78	35.111	9194.4	7.78	13C2-PFOA	1278612.94	25.000		N/A	N/A	✓

CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

SO

Batch 23-1036

Package DP-23-1140

Submitted to:
CH2M
5701 Cleveland Street
Virginia Beach, VA 23462 USA

Submitted by:
Battelle Norwell Operations
141 Longwater Drive Suite 202
Norwell, MA 02061

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CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

SO

Batch 23-1036

Package DP-23-1140

Submitted to:
CH2M
5701 Cleveland Street
Virginia Beach, VA 23462 USA

NELAP Accreditation Number: E87856 (Florida Department of Health)
DoD-ELAP Accreditation Number: 91667

Submitted by:
Battelle Norwell Operations
141 Longwater Drive Suite 202
Norwell, MA 02061

Analyst Approval: Vincent Urso 2023.08.23 09:49:02 -04'00'

QC Chemist Approval: Digitally signed by Carla Devine Date: 2023.08.24 11:10:39 -04'00'

Project Manager Approval: Digitally signed by Robert Lizotte, Jr. Date: 2023.08.24 11:32:32 -04'00'

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CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

SO

Batch 23-1036

Package DP-23-1140

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Master Signature Page

Name (Printed)	Signature	Initials	Date
Jonathan Thorn		JRT	1/9/2020
Robert Lizotte, Jr.		BL	1.9.2020
Elyn M Fitch		EMF	1/9/2020
Carla Devine		CRD	1/9/2020
Denise Schumitz		DS	1/9/2020
Lauren Griffith		LMG	1.9.2020
Carrie P McCarthy		CPM	1/9/2020
Rich Restuccia		RR	1/9/2020
Sam Guimaraes		SAG	1/9/2020
Jordan Tower		JT	1/9/2020
Christie Usher		CU	1/9/2020
Kevin McInerney		KM	1/14/2020
Matt Schumitz		MOS	1/14/2020
Weidong Li		W.L	1/14/2020
Kayla Lamarre		KAL	1/14/2020
MUNAZ MUNTASIR		MM	01/14/2020
Kristen Nichols		KN	01/14/2020
Kelsey Harnden		KH	01/30/2020
Kevin Bailey		KB	1/30/2020
Stephanie Schultz		SAS	1/30/2020

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Name (Printed)	Signature	Initials	Date
Clinicea Brown		CB	01/30/20
Ryan Kelly		RK	01/30/20
KAREN HYPPOLITE		K.H.	01/31/20
Gail DeRuzzo		GD	01/31/2020
Tracy Stenner			1/31/2020
Ashley Wellington		AW	1131/2020
Daniel Cooney		DAC	1/31/2020
Peter Demers		PD	1/31/2020
Andy Delmar		AD	3/19/2021
Emily Reardon		ER	3/19/2021
Brenton Murphy		Bm	3/19/2021
Haley Hart		H H	3/19/21
Allison Wamaess		AW	3/19/21
Taylor NOonan		TN	3/19/21
FRANCO PALA		FP	3/19/21
Amina Chamanlal		AC	11/03/21
J Michelle Wentzell		MW	11-3-21
Zachary Dreiker		ZD	11/3/21
Drew Croke		DC	11/3/21
Zachary Willenberg		ZW	11/3/21

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Master Signature Page

Name (Printed)	Signature	Initials	Date
Hayley Beal	Hayley Beal	HB	5/9/2022
Nathaniel Kinsman	Nathaniel Kinsman	NK	5/9/2022
Debra Huntress	Debra Huntress	DHU	5/9/22
Vincent Urso	Vincent Urso	VU	5/9/22

Sample Summary

Client: CH2M (Jacobs)
SDG: 23-1036
Project/Site: NBK Keyport
CTO: 4117

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Receipt Date
DO705PB-FS	220520-01: Ottawa Sand	SOLID	8/21/2023	8/21/2023
DO706LCS-FS	220520-01: Ottawa Sand	SOLID	8/21/2023	8/21/2023
D7904-FS	NBKK-B76-IDW01-SO-081523	SO	8/15/2023	8/17/2023
D7905-FS	NBKK-B76-IDW02-SO-081623	SO	8/16/2023	8/17/2023

Work Plan

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WORK/QUALITY ASSURANCE PROJECT PLAN

1.0 GENERAL PROJECT INFORMATION

Project Title:	CTO-4117: NBK Keyport PFAS in Solids
Project Number:	G25161.X1.XX.0026.000001
Client:	CH2M 5701 Cleveland Street Suite 200 Virginia Beach, VA 23462 USA
Client Contact Information:	Juan Acaron Project Chemist (352) 331-8121(V) NA juan.acaron@jacobs.com
Effective Date of QAPP:	9/12/2022
Version Number:	G25161.X1.XX.0026.000001(S)-12
Project Manager:	Thorn, Jonathan
Laboratory Task Manager:	Thorn, Jonathan
Deliverable Due Date:	10/14/2022

2.0 SCOPE OF WORK

Overview:	PFAS in solid samples (18 analytes)
Matrix:	Soil/Sediment

2.1 TECHNICAL APPROACH

2.1.1 Sample Receipt, Storage, and Handling

The list of samples for this project plan are presented in Attachment 1.

Storage Directions:	Store refrigerated.
Sub_Sampling:	None
Procedures:	NA
Contact:	NA
Comment:	NA
Archiving:	Dispose of excess samples after six months.
Disposal:	Dispose of excess samples in the appropriate waste stream.

2.1.2 Sample Preparation

NA

Samples Expected:	Samples Per Batch:	Batches Expected:
20	20	1

Batch quality control samples are defined in Table 1.

Target samples are presented in Attachment 1.

Table 1: Quality Control Samples

Type:	*Description:*	*Count:*	*Rgt:*	*Reference:*	*Comment:*
PB	Laboratory control reagent blank.	1 per batch	--	220520-01: Ottawa Sand Lot:2KA0342	
LCS	Laboratory Control Sample	1 per batch	Yes	220520-01: Ottawa Sand Lot:2KA0342	
MS	Spiked field sample for determining method accuracy in the presence of matrix.	1 per batch	--	NA	
MSD	Spiked field sample for determining method accuracy and precision in the presence of matrix.	1 per batch	--	NA	

2.1.3 Extraction/Preparation

2.1.3.1 Extraction

SOP No.-Rev: **5-370-13**

SOP Title: *Extraction of Poly and Perfluoroalkyl Substances from Environmental Matrices*

Sample Size: 5.00 g

SIS and LCS/MS Compounds: Defined in Table 2.

Deviations: None.

Comments: None.

Table 2: SIS and LCS/MS Spiking Level

Standard Type	Standard Contents		Spike Amount (ng)	Volume (uL)	Comment
PFAS DoD Surrogate (18 Targets)	LS23	SIS	~ 25.0 ng	50 uL	NA
PFAS DoD Second Source LCS/MS (18	LR93	LCS/MS	~ 50 ng	125 uL	Vary spike between 100 and 150 µL

Standard Type	Standard Contents	Spike Amount (ng)	Volume (uL)	Comment
Analytes)				

2.1.3.2 Cleanup

None.

RIS spiking levels are presented in Table 3.

Extract PIV (uL): 5000

Table 3: RIS Spiking Level

Standard Type	Standard Contents	Spike Amount (ng)	Volume (uL)	Comment
PFAS DoD Internal Standards	LS03 RIS	~ 25.0 ng	50 uL	NA

2.1.4 Instrumental Analysis

The list of analytes along with data quality criteria are presented in Attachment 2.

1) SOP_No-Rev: **5-369-09**

SOP_Title: *Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS)*

Deviations: None

Comments: None

2.2. DELIVERABLES

Deliverables Due:	10/14/2022
LIMS Reports:	*No*
Histograms:	*No*
Excel Tables:	*No*
EICs:	*No*
Chromatograms:	*No*
EDDs:	*No*
Comments:	• Individual data sets will be due 28 days after receipt of each sample set. • Select data sets have expedited TAT. • Full Level 4 data package (QSM 5.3 Table B-15 compliant) required.

- CH2M EDD required.
- WO 148003519

3.0 QUALITY

The Method Quality Objectives are defined in Attachment 3.

4.0 ORGANIZATION AND COMMUNICATION

4.1 ORGANIZATION

The project team is defined in Table 4. Supervisors may make substitutions with Project Manager concurrence.

Table 4: Project Team and Roles

Staff Member	Role	Comment
Jonathan R. Thorn	Project Manager	NA
Kelsey Harnden	Sample Preparation	NA
Denise M. Schumitz	LC-MS/MS Analysis	NA
Matt D. Schumitz	Sample Custody	NA
Carla R. Devine	Quality Control Officer	NA
Zachary J. Willenberg	Quality Assurance Officer	NA

4.2 COMMUNICATION

A kick-off meeting will be held to discuss project scope and goals.

5.0 SCHEDULE

The project schedule is presented in Table 5.

Table 5. Schedule of Laboratory Activities

Activity:	Start Date:	End Date:	TAT (days):	Comment:
Sample Receipt	09/12/2022	09/12/2022	0	NA
Sample Preparation	09/12/2022	09/30/2022	18	NA
Instrument Analysis	09/30/2022	10/13/2022	13	NA
Quality Control Review	10/13/2022	10/14/2022	1	NA
Quality Assurance Review	10/14/2022	10/14/2022	0	NA

6.0 BUDGET

The labor budget for the analytical task is presented in Table 6.

Table 6. Labor Budget (Laboratory Analytical Task)

Labor Activity:	Hours/ Batch:	Batches:	Total Hours:	Comment:
Sample Receipt	2	1	2	Hours per 12 samples
Sample Preparation	5	1	5	Hours per 12 samples
Instrument Analysis	5	1	5	Hours per 12 samples
Quality Control Review	2	1	2	1.5 hours per 12 samples
Quality Assurance Review	1	1	1	Hours per 12 samples

7.0 STAFF DEVELOPMENT

None anticipated.

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 1: Target Samples

Shipment: **SHP-220912-02**

Status: Pending

Description: NBK Keyport PFAS SI

Range: E6452-E6463

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E6452	NBKK-B76-SB01-0203	08/30/2022 11:05 am	SO	R0119 (NA)			
2	E6453	NBKK-B76-SB02-0203	08/30/2022 2:20 pm	SO	R0119 (NA)			
3	E6454	NBKK-B76-SB03-0203	08/30/2022 12:35 pm	SO	R0119 (NA)			
4	E6455	NBKK-B76-SB03-3334	09/01/2022 1:10 pm	SO	R0119 (NA)			
5	E6456	NBKK-OU2A5-SS01-0H01	09/07/2022 1:10 pm	SO	R0119 (NA)			
6	E6457	NBKK-B76-SB04-5859	09/06/2022 11:40 am	SO	R0119 (NA)			
7	E6458	NBKK-B76-SS05-0001	09/02/2022 11:05 am	SO	R0119 (NA)			
8	E6459	NBKK-OU2A5-SS03P-0102	09/07/2022 10:50 am	SO	R0119 (NA)			
9	E6460	NBKK-OU2A5-SS03-0102	09/07/2022 10:50 am	SO	R0119 (NA)			
10	E6461	NBKK-B76-SB02-4849	08/31/2022 3:10 pm	SO	R0119 (NA)			
11	E6462	NBKK-B76-SB04-0102	08/31/2022 10:00 am	SO	R0119 (NA)			
12	E6463	NBKK-B76-SB01-2526	08/30/2022 1:55 pm	SO	R0119 (NA)			

Shipment: **SHP-220916-02**

Status: Pending

Description: NBK Keyport

Range: E6619-E6620

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E6619	NBKK-OU2A5-SB02-0102	09/07/2022 11:15 am	SO	R0119 (NA)			
2	E6620	NBKK-OU2A5-SB03-3334	09/08/2022 11:10 am	SO	R0119 (NA)			

Shipment: **SHP-221004-07**

Status: Pending

Description: NBK Keyport

Range: E7804-E7815

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E7804	NBKK-CF1-SS05-0001	09/30/2022 10:08 am	SOIL	R0119 (NA)			
2	E7806	NBKK-CF1-SS04-0001	09/30/2022 10:55 am	SOIL	R0119 (NA)			
3	E7807	NBKK-B1006-SS05-0001	09/30/2022 12:03 pm	SOIL	R0119 (NA)			
4	E7809	NBKK-B1006-SS06-0001	09/30/2022 12:37 pm	SOIL	R0119 (NA)			
5	E7810	NBKK-B1006-SS07-0001	09/30/2022 1:03 pm	SOIL	R0119 (NA)			
6	E7811	NBKK-B1006-SS01-0102	10/01/2022 9:35 am	SOIL	R0119 (NA)			

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WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221004-07**

Status: Pending

Description: NBK Keyport

Range: E7804-E7815

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
7	E7812	NBKK-B1006-SS02-0102	10/01/2022 10:55 am	SOIL	R0119 (NA)			
8	E7813	NBKK-B1006-SS03-0001	10/01/2022 11:30 am	SOIL	R0119 (NA)			
9	E7814	NBKK-B76-SB05-0304	10/01/2022 2:35 pm	SOIL	R0119 (NA)			
10	E7815	NBKK-LFEX-SS03-0102	10/03/2022 10:00 am	SOIL	R0119 (NA)			

Shipment: **SHP-221011-05**

Status: Pending

Description: PNW PFAS SI NBK KEYPORT

Range: E8151-E8156

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E8151	NBKK-LFEX-SB03-0708	10/03/2022 2:50 pm	SOIL	R0119 (NA)			
2	E8152	NBKK-LFEX-SB03-1718	10/03/2022 2:55 pm	SOIL	R0119 (NA)			
3	E8153	NBKK-LFEX-SS02-0001	10/03/2022 2:05 pm	SOIL	R0119 (NA)			
4	E8154	NBKK-LFEX-SB02-2122	10/04/2022 2:25 pm	SOIL	R0119 (NA)			
5	E8155	NBKK-LFEX-SS01-0001	10/04/2022 2:35 pm	SOIL	R0119 (NA)			
6	E8156	NBKK-LFEX-SS04-0001	10/04/2022 5:05 pm	SOIL	R0119 (NA)			

Shipment: **SHP-221013-06**

Status: Pending

Description: PNW PFAS SI NBK-KEYPART

Range: E8359-E8363

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E8359	NBKK-LFEX-SB01-2728	10/06/2022 4:20 pm	SOIL	R0119 (NA)			
2	E8360	NBKK-LFEX-SB04-2627	10/07/2022 3:20 pm	SOIL	R0119 (NA)			
3	E8361	NBKK-CF1-SB02-1H2H	10/07/2022 4:20 pm	SOIL	R0119 (NA)			
4	E8362	NBKK-CF1-SS01-0001	10/08/2022 9:15 am	SOIL	R0119 (NA)			
5	E8363	NBKK-CF1-SB03-0102	10/08/2022 11:25 am	SOIL	R0119 (NA)			

Shipment: **SHP-221019-07**

Status: Pending

Description: PNW PFAS SI NBK-Keyport

Range: E8546-E8547

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E8546	NBKK-CF1-SB01-5152	10/13/2022 3:15 pm	SOIL	R0119 (NA)			

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It can be done

WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221019-07**

Status: Pending

Description: PNW PFAS SI NBK-Keyport

Range: E8546-E8547

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
2	E8547	NBKK-CF1-SB03-5253	10/15/2022 10:20 am	SOIL	R0119 (NA)			

Shipment: **SHP-221028-01**

Status: Pending

Description: PNW PFAS SI NBK-KEYPORT

Range: E9287-E9291

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9287	NBKK-S7-SS04-0102	10/25/2022 9:20 am	SOIL	R0119 (NA)			
2	E9288	NBKK-S7-SB04-0910	10/25/2022 3:15 pm	SOIL	R0119 (NA)			
3	E9289	NBKK-S7-SS05-0102	10/26/2022 11:45 am	SOIL	R0119 (NA)			
4	E9291	NBKK-S7-SB05-0910	10/26/2022 2:20 pm	SOIL	R0119 (NA)			

Shipment: **SHP-221031-02**

Status: Pending

Description: PNW PFAS SI NBK Keyport

Range: E9337-E9346

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9337	NBKK-IDW01-SO-102722	10/27/2022 1:00 pm	SOIL	R0119 (NA)			
2	E9338	NBKK-IDW02-SO-102722	10/27/2022 1:45 pm	SOIL	R0119 (NA)			
3	E9339	NBKK-IDW03-SO-102722	10/27/2022 2:15 pm	SOIL	R0119 (NA)			
4	E9341	NBKK-S7-SS02-0001	10/27/2022 11:25 am	SOIL	R0119 (NA)			
5	E9342	NBKK-S7-SS02-0001 MS	10/27/2022 11:25 am	SOIL	R0119 (NA)			
6	E9343	NBKK-S7-SS02-0001 MSD	10/27/2022 11:25 am	SOIL	R0119 (NA)			
7	E9345	NBKK-S7-SB02-1011	10/27/2022 3:15 pm	SOIL	R0119 (NA)			
8	E9346	NBKK-S7-SS01-0102	10/28/2022 10:00 am	SOIL	R0119 (NA)			

Shipment: **SHP-221103-06**

Status: Pending

Description: PNW PFAS SI NBK KEYORT

Range: E9604-E9612

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:

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It can be done

WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221103-06**

Status: Pending

Description: PNW PFAS SI NBK KEYORT

Range: E9604-E9612

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9604	NBKK-S7-SB01-0809	10/28/2022 1:30 pm	SO	R0119 (NA)			
2	E9605	NBKK-OU2A5-SB02-2930	10/29/2022 1:15 pm	SO	R0119 (NA)			
3	E9606	NBKK-OU2A5-SB02P-2930	10/29/2022 1:15 pm	SO	R0119 (NA)			
4	E9607	NBKK-OU2A5-SB01-3637	10/31/2022 2:00 pm	SO	R0119 (NA)			
5	E9608	NBKK-OU2A5-SB05-0203	11/01/2022 10:55 am	SO	R0119 (NA)			
6	E9609	NBKK-OU2A5-SB05-1011	11/01/2022 12:10 pm	SO	R0119 (NA)			
7	E9610	NBKK-OU2A5-SB04-0203	11/01/2022 12:45 pm	SO	R0119 (NA)			
8	E9611	NBKK-OU2A5-SB04-0506	11/01/2022 2:30 pm	SO	R0119 (NA)			
9	E9612	NBKK-CF1-SS02-0H01	11/01/2022 4:55 pm	SO	R0119 (NA)			

Shipment: **SHP-221110-02**

Status: Pending

Description: NBK Keyport

Range: E9763-E9777

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9763	NBKK-CF1-SB02-3839	11/02/2022 2:00 pm	SO	R0119 (NA)			
2	E9764	NBKK-B1006-SS04-0H01	11/03/2022 1:10 pm	SO	R0119 (NA)			
3	E9765	NBKK-B1006-SS04P-0H01	11/03/2022 1:10 pm	SO	R0119 (NA)			
4	E9766	NBKK-OU2A2-SS02-0H01	11/04/2022 10:10 am	SO	R0119 (NA)			
5	E9767	NBKK-OU2A2-SS03-0203	11/04/2022 1:30 pm	SO	R0119 (NA)			
6	E9768	NBKK-OU2A2-SS03-0203-MS	11/04/2022 1:30 pm	SO	R0119 (NA)			
7	E9769	NBKK-OU2A2-SS03-0203-MSD	11/04/2022 1:30 pm	SO	R0119 (NA)			
8	E9770	NBKK-OU2A2-SS01-0H01	11/05/2022 9:00 am	SO	R0119 (NA)			
9	E9771	NBKK-OU2A2-SS04-0203	11/07/2022 11:45 am	SO	R0119 (NA)			
10	E9773	NBKK-OU2A2-SS05-0102	11/08/2022 9:10 am	SO	R0119 (NA)			
11	E9775	NBKK-OU2A2-SS06-0H01	11/08/2022 10:40 am	SO	R0119 (NA)			
12	E9776	NBKK-OU2A2-SS06-0304	11/08/2022 10:55 am	SO	R0119 (NA)			

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WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221110-02**

Status: Pending

Description: NBK Keyport

Range: E9763-E9777

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
13	E9777	NBKK-OU2A2-SB05-0607	11/08/2022 11:45 am	SO	R0119 (NA)			

Shipment: **SHP-221115-01**

Status: Pending

Description: NBK KEYPORT

Range: D0013-D0015

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	D0013	NBKK-OU2A2-SD01-0004	11/10/2022 2:55 pm	SOIL	R0119 (NA)			
2	D0014	NBKK-OU2A2-SD02-0004	11/10/2022 3:15 pm	SOIL	R0119 (NA)			
3	D0015	NBKK-OU2A2-SD03-0004	11/10/2022 2:05 pm	SOIL	R0119 (NA)			

Shipment: **SHP-221117-06**

Status: Pending

Description: PNW PFAS SI

Range: D0215-D0220

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	D0215	NBKK-IDW05-SO-111522	11/15/2022 9:40 am	SOIL	R0119 (NA)			
2	D0216	NBKK-IDW06-SO-111522	11/15/2022 10:45 am	SOIL	R0119 (NA)			
3	D0217	NBKK-IDW07-SO-111522	11/15/2022 11:45 am	SOIL	R0119 (NA)			
4	D0218	NBKK-IDW08-SO-111522	11/15/2022 1:15 pm	SOIL	R0119 (NA)			
5	D0219	NBKK-IDW09-SO-111522	11/15/2022 2:00 pm	SOIL	R0119 (NA)			
6	D0220	NBKK-IDW10-SO-111522	11/15/2022 2:40 pm	SOIL	R0119 (NA)			

Shipment: **SHP-230811-04**

Status: Pending

Description: Keyport-BLDG 76

Range: D7459-D7477

Comment: NA

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WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-230811-04**

Status: Pending

Description: Keyport-BLDG 76

Range: D7459-D7477

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	D7459	NBKK-B76-SB08-1516	08/09/2023 5:13 pm	SOIL	F0115 (NA)			
2	D7460	NBKK-B76-SB08P-1516	08/09/2023 5:14 pm	SOIL	F0115 (NA)			
3	D7461	NBKK-B76-SS11-0001	08/08/2023 2:00 pm	SOIL	F0115 (NA)			
4	D7462	NBKK-B76-SB11-0103	08/08/2023 2:20 pm	SOIL	F0115 (NA)			
5	D7465	NBKK-B76-SS06-0001	08/08/2023 4:34 pm	SOIL	F0115 (NA)			
6	D7466	NBKK-B76-SS08-0001	08/10/2023 11:03 am	SOIL	F0115 (NA)			
7	D7467	NBKK-B76-SS09-0001	08/09/2023 11:45 am	SOIL	F0115 (NA)			
8	D7468	NBKK-B76-SB09-1415	08/09/2023 12:00 pm	SOIL	F0115 (NA)			
9	D7469	NBKK-B76-SS10-0001	08/09/2023 5:10 pm	SOIL	F0115 (NA)			
10	D7470	NBKK-B76-SS10-0103	08/09/2023 5:15 pm	SOIL	F0115 (NA)			
11	D7471	NBKK-B76-SS12-0001	08/09/2023 11:00 am	SOIL	F0115 (NA)			
12	D7472	NBKK-B76-SB12-0103	08/09/2023 11:15 am	SOIL	F0115 (NA)			
13	D7473	NBKK-B76-SB12-0103-MS	08/09/2023 11:15 am	SOIL	F0115 (NA)			
14	D7474	NBKK-B76-SB12-0103-MSD	08/09/2023 11:15 am	SOIL	F0115 (NA)			
15	D7475	NBKK-B76-SS13-0001	08/09/2023 3:00 pm	SOIL	F0115 (NA)			
16	D7476	NBKK-B76-SS13P-0001	08/09/2023 3:05 pm	SOIL	F0115 (NA)			
17	D7477	NBKK-B76-SB13-0103	08/09/2023 3:15 pm	SOIL	F0115 (NA)			

Shipment: **SHP-230817-04**

Status: Pending

Description: Keyport BLDG76

Range: D7883-D7905

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	D7883	NBKK-B76-SS07-0001	08/10/2023 5:05 pm	SOIL	R0119 (NA)	BIN	483	
2	D7884	NBKK-B76-SS07-0001-MS	08/10/2023 5:05 pm	SOIL	R0119 (NA)	BIN	483	
3	D7885	NBKK-B76-SS07-0001-MSD	08/10/2023 5:05 pm	SOIL	R0119 (NA)	BIN	483	
4	D7886	NBKK-B76-SB07-2223	08/10/2023 5:20 pm	SOIL	R0119 (NA)	BIN	483	
5	D7887	NBKK-B76-SB07-1516	08/10/2023 5:15 pm	SOIL	R0119 (NA)	BIN	483	
6	D7889	NBKK-B76-SB08-2425	08/10/2023 11:20 am	SOIL	R0119 (NA)	BIN	483	
7	D7890	NBKK-B76-SB09-1920	08/09/2023 11:50 am	SOIL	R0119 (NA)	BIN	483	
8	D7891	NBKK-B76-SB06-2325	08/11/2023 10:09 am	SOIL	R0119 (NA)	BIN	483	
9	D7892	NBKK-B76-SB06-0910	08/11/2023 10:04 am	SOIL	R0119 (NA)	BIN	483	
10	D7904	NBKK-B76-IDW01-SO-0815823	08/15/2023 11:42 am	SO	R0119 (NA)	BIN	483	
11	D7905	NBKK-B76-IDW02-SO-0816823	08/16/2023 11:42 am	SO	R0119 (NA)	BIN	483	

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name:	Master_369D
SOP Reference:	5-369 - Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS)
Description:	PFAS by DoD QSM 5.3 Table B-15
Matrix:	S - Solid Samples, like soil or sediment, prepared and anlyzed under the same class of detection limits.
Detection Limit Study:	5-369
Instrument:	LC-MS/MS
MQO Criteria	Universal_LC
Standard Report:	Standard Result Report

Method Specific Reporting				Holding Times (days)		Data Flags	
Result Units:	ng/g	***Unit Conversion:***	(none)	***Sample:***	14	***DL_Flag:***	U
Weight Basis:	DRY	***Result Format:***	Fixed Digits	***Frozen:***	14	***RL_Flag:***	J
Standard Basis:	SIS	***# of Figures/Digits:***	2	***Extract:***	28	***PB_Flag:***	B
Oil Weight Basis:	No	***Oil Weight Source:***	Oil Weight			***DIL_Flag:***	D
U-Value Substition:	U-Flag=MD	***Histograms:***	No			***HT_Flag:***	T
ECD_Reporting:	No						

No:	Analyte:	Report Name:	Type	RIS	SIS	Hidden:	Graph:
1	Perfluoro-n-hexanoic acid	PFHxA	T		13C5-PFHxA	No	No
2	Perfluoro-n-heptanoic Acid	PFHpA	T		13C4-PFHpA	No	No
3	Perfluoro-n-octanoic Acid	PFOA	T		13C8-PFOA	No	No
4	Perfluorononanoic Acid	PFNA	T		13C9-PFNA	No	No
5	Perfluoro-n-decanoic Acid	PFDA	T		13C6-PFDA	No	No
6	Perfluoro-n-undecanoic acid	PFUnA	T		13C7-PFUnA	No	No
7	Perfluoro-n-dodecanoic acid	PFDoA	T		13C2-PFDoA	No	No
8	Perfluoro-n-tridecanoic acid	PFTrDA	T		13C2-PFTeDA	No	No
9	Perfluoro-n-tetradecanoic acid	PFTeDA	T		13C2-PFTeDA	No	No
10	N-methylperfluoro-1-octanesulfonamidoacetic acid	NMeFOSAA	T		d3-MeFOSAA	No	No
11	N-ethylperfluoro-octanesulfonamidoacetic acid	NEtFOSAA	T		d5-EtFOSAA	No	No
12	Perfluoro-1-butanesulfonate	PFBS	T		13C3-PFBS	No	No
13	Perfluoro-1-hexanesulfonate	PFHxS	T		13C3-PFHxS	No	No
14	Perfluoro-1-octanesulfonate	PFOS	T		13C8-PFOS	No	No
15	Hexafluoropropylene oxide dimer acid	HFPO-DA	T		13C3-HFPO-DA	No	No
16	Adona	Adona	T		13C8-PFOA	No	No
17	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	T		13C8-PFOA	No	No

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name: Master_369D

No:	Analyte:	Report Name:	Type	RIS	SIS	Hidden:	Graph:
18	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	T		13C8-PFOA	No	No
1	13C5-PFHxA	13C5-PFHxA	SIS	13C2-PFOA		No	No
2	13C4-PFHpA	13C4-PFHpA	SIS	13C2-PFOA		No	No
3	13C8-PFOA	13C8-PFOA	SIS	13C2-PFOA		No	No
4	13C9-PFNA	13C9-PFNA	SIS	13C2-PFOA		No	No
5	13C6-PFDA	13C6-PFDA	SIS	13C2-PFDA		No	No
6	13C7-PFUnA	13C7-PFUnA	SIS	13C2-PFDA		No	No
7	13C2-PFDoA	13C2-PFDoA	SIS	13C2-PFDA		No	No
8	13C2-PFTeDA	13C2-PFTeDA	SIS	13C2-PFDA		No	No
9	d3-MeFOSAA	d3-MeFOSAA	SIS	13C4-PFOS		No	No
10	d5-EtFOSAA	d5-EtFOSAA	SIS	13C4-PFOS		No	No
11	13C3-PFBS	13C3-PFBS	SIS	13C4-PFOS		No	No
12	13C3-PFHxS	13C3-PFHxS	SIS	13C4-PFOS		No	No
13	13C8-PFOS	13C8-PFOS	SIS	13C4-PFOS		No	No
14	13C3-HFPO-DA	13C3-HFPO-DA	SIS	13C2-PFOA		No	No

Total Analytes: 32

Subtract Peaks:

None

Sum Peaks:

None

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name: Master_369D

ICAL Acceptance Criteria:

Curve Fit:	Limit Mean(%):	Mean Qual:	Limit Ind.:	Ind. Qual:	Min Points:	Points Qual:	Comments:
Linear	NA	NA	0.99	N	5	N	y = Bx + C
Quadratic	NA	NA	0.99	N	6	N	y = Ax^2 + Bx + C

Continuing Calibration Verification Criteria:

CCV Name: 5-369

Frequency Hrs:		Mean PD(%):		Individual PD(%):		RIS/SIS RT Window (min):		Area Limit Low(%):	Area Limit High(%):		Comment:
12	(N)	30	(N)	30	(N)	0.04	(N)	-50	100	(N)	NA

Independent Calibration Verification:

ICC Name: 5-369

Mean PD Limit(%):		Ind. PD Limit(%):		RIS/SIS Window Limit (Secs):		Area Limit High(%):	Area Limit Low(%):		Comment:
30	(N)	30	(N)	0.04	(N)	-50	100	(N)	NA

Mass Discrimination Criteria:

None

Degredation Check Criteria:

None

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 3: Method Quality Objectives

MQO Application:	***Universal_LC***		
MQO:	**Acceptance Criteria:**	**Qual:**	**Corrective Action:**
Procedural Blank	Samples must be greater than five times the blank concentration (>5xPB).	B	Review with Project Manager; re-analyze or justify results in project records.
PB Measurement Quality Objective	Organic results in the Procedural Blank are less than 1/2 times the LOQ (<1/2xLOQ)	N	Review with Project Manager; re-analyze or justify results in project records.
Laboratory Control Sample	Recovery values 70-130%.	N	Review with project manager; re-analyze or justify reporting the results in project records.
Matrix Spike / Matrix Spike Duplicate Recovery	Organics 70-130%. Analyte concentration in MS/MSD must be greater than five times reported background concentration.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the Original	n	
Matrix Spike/Spike Duplicate Precision	Organics results less than 30% Relative Percent Difference (RPD). Analyte concentration in MS/MSD must be greater than five times reported background concentration.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the Original	n	
Standard Reference Material Accuracy	Organics Percent Difference less than 30% from a range of certified values on average. Analyte concentration must be greater than five times the Method Detection Limit (>5xMDL).	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the MDL	n	
Analytical Duplicate Precision	Organics results less than 30% Relative Percent Difference (RPD). Analyte concentration must be > 5x MDL.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Original is less than 5 times the MDL	n	

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 3: Method Quality Objectives

MQO Application:	***Universal_LC***		
MQO:	**Acceptance Criteria:**	**Qual:**	**Corrective Action:**
Analytical Triplicate Precision	Organics results less than 30% Relative Standard Deviation (RSD). Analyte concentration must be > 5x MDL.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Original is less than 5 times the MDL	n	
Surrogate Compound Recovery	Recovery results between 50% and 150%.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
Control Oil	RPD < 30% for at least 90% of analytes	N	Results examined by project manager, task leader, or subcontractor lab manager. Reextraction, reanalysis, or justification documented.
Instrument Calibration	5-369-9: R-squared greater than or equal to 0.990		Results examined by project manager, task leader, or subcontractor lab manager. Reextraction, reanalysis, or justification documented.
Independent Calibration Check Solution	5-369-9: Individual PD less than or equal to 30%. Mean Percent Difference less than or equal to 30%.	N	Review with Project Manager; re-analyze or justify in project records.
Continuing Calibration Verification	5-369-9: Individual PD less than or equal to 30%. Mean Percent Difference less than or equal to 30%.	N	Review with Project Manager; re-analyze or justify in project records.

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ShpNo SHP-230817-04

Battelle Project No: 026.000001

Sample Receipt Form

Approved: ☐ Authorized ☐

Project Number: 704758CH **Client:** Jacobs

Received by: Schumitz, Matt **Date/Time Received:** Thursday, August 17, 2023 10:00 AM

No. of Shipping Containers: 3

SHIPMENT

Method of Delivery: Commercial Carrier **Tracking Number:** Fed Ex

COC Forms: ☑ Shipped with samples ☐ No Forms

Cooler(s)/Box(es)

Cntr	Type	Tracking No.	Seal	Seal	Container	Therm.	Temp C	Smps
1 of 3	Cooler	7825 9871 9195	Custody Seals	Intact	Intact	Therm_4	1.9	9
2 of 3	Cooler	7825 9871 9200	Custody Seals	Intact	Intact	Therm_4	1.7	12
3 of 3	Cooler	7825 8836 7937	Custody Seals	Intact	Intact	Therm_4	2.3	4

Samples

Sample Labels:
☑ Sample labels agree with COC forms
☐ Discrepancies (see Sample Custody Corrective Action Form)

Container Seals:
☐ Tape ☐ Custody Seals ☐ Other Seals (See sample Log)
☑ Seals intact for each shipping container
☐ Seals broken (See sample log for impacted samples)

Condition of Samples:
☑ Sample containers intact
☐ Sample containers broken/leaking (See Custody Corrective Action Form)

Temperature upon receipt (°C): 2.3 Temperature Blank used ☑ Yes ☐ No
(Note: If temperature upon receipt differs from required conditions, see sample log comment field)

Samples Acidified: ☐ Yes ☐ No ☑ Unknown

Initial pH 5-9?: ☐ Yes ☐ No ☑ NA
If no, individual sample adjustments on the Auxiliary Sample Receipt Form

Total Residual Chlorine Present?: ☐ Yes ☐ No ☑ NA
If yes, individual sample adjustments on the Auxiliary Sample Receipt Form

Head Space <1% in samples for water VOC analysis: ☐ Yes ☐ No ☑ NA
Individual sample deviations noted on sample log

Samples Containers:
Samples returned in PC-grade jars: ☐ Yes ☐ No ☑ Unknown /Lot No.: Unknown

Storage Location: Custody: Refrigerator - R0119 (NA) **BDO IDs Assigned:** D7881 - D7905

Samples logged in by: Schumitz, Matt **Date/Time:** 08/17/2023 10:00 AM

Approved By: **Approved On:**

Authorized By: **Authorized On:**

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ShpNo SHP-230817-04

Battelle Project No: 026.000001

Sample Receipt Form Details

Approved: ☐ **Authorized** ☐

Project Number: 704758CH **Client:** Jacobs

Received by: Schumitz, Matt **Date/Time Received:** Thursday, August 17, 2023 10:00 AM

No. of Shipping Containers: 3

BDO Id:	Client Sample ID:	Collection Date:	Login Date:	Ctrs:	Matrix:	Temp:	pH:	TRC:	VOC:	Stored In:	Loc:	No:	Comments:
D7881	NBKK-B76-FB01-081123	08/11/23 13:51	08/17/23 12:07	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7882	NBKK-B76-EB01-081123	08/11/23 13:25	08/17/23 12:07	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7883	NBKK-B76-SS07-0001	08/10/23 17:05	08/17/23 12:07	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7884	NBKK-B76-SS07-0001-MS	08/10/23 17:05	08/17/23 12:11	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7885	NBKK-B76-SS07-0001-MSD	08/10/23 17:05	08/17/23 12:11	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7886	NBKK-B76-SB07-2223	08/10/23 17:20	08/17/23 12:11	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7887	NBKK-B76-SB07-1516	08/10/23 17:15	08/17/23 12:11	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7888	NBKK-B76-EB01-081023	08/10/23 17:30	08/17/23 12:12	2	W	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7889	NBKK-B76-SB08-2425	08/10/23 11:20	08/17/23 12:13	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7890	NBKK-B76-SB09-1920	08/09/23 11:50	08/17/23 12:13	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7891	NBKK-B76-SB06-2325	08/11/23 10:09	08/17/23 12:14	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7892	NBKK-B76-SB06-0910	08/11/23 10:04	08/17/23 12:14	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7893	NBKK-B76-MW06-0823	08/14/23 15:17	08/17/23 12:14	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7894	NBKK-B76-MW06P-0823	08/14/23 15:12	08/17/23 12:15	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7895	NBKK-B76-FB01-081423	08/14/23 16:21	08/17/23 12:15	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7896	NBKK-B76-MW08-0823	08/15/23 9:49	08/17/23 12:16	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7897	NBKK-B76-MW07-0823	08/15/23 13:51	08/17/23 12:16	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7898	NBKK-B76-EB01-081523	08/15/23 13:56	08/17/23 12:17	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7899	NBKK-B76-MW09-0823	08/14/23 16:13	08/17/23 12:17	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7900	NBKK-B76-MW09-0823-MS	08/14/23 16:13	08/17/23 12:17	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7901	NBKK-B76-MW09-0823-MSD	08/14/23 16:13	08/17/23 12:18	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7902	NBKK-B76-IDW01-AQ-081623	08/16/23 11:20	08/17/23 12:18	2	W	2.3	NA	NA	NA	R0119 (NA)	BIN	482	
D7903	NBKK-B76-IDW02-AQ-081623	08/16/23 11:57	08/17/23 12:18	2	W	2.3	NA	NA	NA	R0119 (NA)	BIN	482	
D7904	NBKK-B76-IDW01-SO-081523	08/15/23 11:42	08/17/23 12:19	1	SO	2.3	NA	NA	NA	R0119 (NA)	BIN	483	
D7905	NBKK-B76-IDW02-SO-081623	08/16/23 11:02	08/17/23 12:19	1	SO	2.3	NA	NA	NA	R0119 (NA)	BIN	483	

Total Samples: 25

BATTELLE Chain of Custody

PAGE 1 OF 2

Project Name: KEYPORT BLD676	**Client Project Manager:** DENNIS BALLAM	**Client Project Number:** 704758CH
Deliver Results to: JUAN ACARON	**Samples Collected by:** LYNDSEY KLEPPIN	
Address: 3011 SW WILLSTON ROAD GAINSVILLE, FL 32608-3164	**Phone:** 907 227 0525	
	Email: LYNDSEY.KLEPPIN@JACOBS.COM	
Phone: 352-384-7002	**Time Zone:** AK	14B003519
Email: JUAN.ACARON@JACOBS.COM	**PO reference:**	

Test / Preservative[1]: PFAS

COC Number: CB1523-01

Turnaround Time[2]:
- ☐ 28-days (standard)
- ☐ 21-days (Rush)
- ☐ 14-days (Rush)
- ☒ 7-days (Rush)
- ☐ 3-day (Rush)

	Sample ID	Date	Time	Type[3]	Matrix	Count	Lab ID	PFAS	Sample Comments
✓	NBKK-B76-FB01-CB1123	8/11/23	1351		WATER	2	D7881	X	
✓	NBKK-B76-EB01-CB1123	8/11/23	1325		WATER	2	82	X	
✓	NBKK-B76-SS07-0001	8/10/23	1705		SOIL	1	83	X	
✓	NBKK-B76-SS07-0001-MS	8/10/23	1705		SOIL	1	84	X	
✓	NBKK-B76-SS07-0001-MSD	8/10/23	1705		SOIL	1	85	X	
✓	NBKK-B76-SB07-2223	8/10/23	1720		SOIL	1	86	X	HOLD
✓	NBKK-B76-SB07-1516	8/10/23	1715		SOIL	1	87	X	
✓	NBKK-B76-EB01-CB1023	8/10/23	1730		~~SOIL~~ W	2	88	X	
✓	NBKK-B76-SB08-2425	8/10/23	1120		SOIL	1	89	X	
✓	NBKK-B76-SB09-1920	8/09/23	1150		SOIL	1	90	X	
✓	NBKK-B76-SB06-2325	8/11/23	1009		SOIL	1	91	X	HOLD
✓	NBKK-B76-SB06-0910	8/11/23	1004		SOIL	1	92	X	
✓	NBKK-B76-MW06-0823	8/14/23	1517		WATER	2	93	X	
✓	NBKK-B76-MW06P-0823	8/14/23	1512		WATER	2	94	X	
✓	NBKK-B76-FB01-CB1423	8/14/23	1821		WATER	2	D7895	X	

Relinquished by (Print/Sign): LYNDSEY KLEPPIN	Company: JACOBS	Date/Time: 8/15/23 1600	Received by (Print/Sign):	Company: BWO	Date/Time: 8/17/23 1000
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:

Field Project comments: SOIL SAMPLES IN COOLER #01
WATER SAMPLES IN COOLER #02

Receipt comments:

[1] include comments in the Field Project comment field if there are method specific requirements, i.e., "WHO PCB Congener list", "PFAS – 18 analytes", or "PFAS – 29 analytes from UCMR5"

[2] Rush TAT request should be verified with the lab prior to submitting samples

[3] Client sample type, if applicable

BATTELLE Chain of Custody

Project Name: KEYPORT BLDG 76	**Client Project Manager:** DENNIS BALLAM	**Client Project Number:** 704758CH
Deliver Results to: JAN ACARON	**Samples Collected by:** LYNDSEY KLEPPIN	
Address:	**Phone:** 907 227 0535	
	Email: LYNDSEY.KLEPPIN@JACOBS.COM	
Phone:	**Time Zone:** AK	
Email:	**PO reference:** 1480003519	

Test / Preservative[1]: PFAS

COC Number: ØB1523-Ø2

Turnaround Time[2]:
- ☐ 28-days (standard)
- ☐ 21-days (Rush)
- ☐ 14-days (Rush)
- ☐ 7-days (Rush)
- ☐ 3-day (Rush)

	Sample ID	Date	Time	Type[3]	Matrix	Count	Lab ID	PFAS	Sample Comments
✓	NBKK-B76-MWØ8-ØB23	8/15/23	Ø949		WATER	2	D7896	X	
✓	NBKK-B76-MWØ7-ØB23	8/15/23	1351		WATER	2	97	X	
✓	NBKK-B76-EBØ1-ØB1523	8/15/23	1356		WATER	2	98	X	
✓	NBKK-B76-MWØ9-ØB23	8/14/23	1613		WATER	2	99	X	
✓	NBKK-B76-MWØ9-ØB23-MS	8/14/23	1613		WATER	2	D7900	X	
✓	NBKK-B76-MWØ9-ØB23-MSD	8/14/23	1613		WATER	2	D7901	X	

Relinquished by (Print/Sign)	Company	Date/Time	Received by (Print/Sign)	Company	Date/Time
LYNDSEY KLEPPIN	JACOBS	8/15/23 1600		BNO	8/17/23 1000

Field Project comments:
SOIL SAMPLES IN COOLER # Ø1
WATER CAMPLES IN COOLER #02

Receipt comments:

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[1] include comments in the Field Project comment field if there are method specific requirements, i.e., "WHO PCB Congener list", "PFAS – 18 analytes", or "PFAS – 29 analytes from UCMR5"

[2] Rush TAT request should be verified with the lab prior to submitting samples

[3] Client sample type, if applicable

BATTELLE

Chain of Custody

Project Name: KEYPORT BLDG 76	**Client Project Manager:** DENNIS BALLAM	**Client Project Number:** 704758CH	**COC Number:** 08623
Deliver Results to: JUAN ALARON	**Samples Collected by:** LYNDSEY KLEPPIN		**Turnaround Time[2]:** ☐ 28-days (standard) ☐ 21-days (Rush) ☐ 14-days (Rush) ☒ 7-days (Rush) ☐ 3-day (Rush)
Address: 3011 SW WILLISTON RD GAINSVILLE FL 32608-3967	**Phone:** 907 227 0525		
Phone: 352-384-7002	**Email:** LYNDSEY.KLEPPINC@JACOBS.COM		
Email: JAN.ALARON@JACOBS.COM	**Time Zone:** AK		
	PO reference: 4800351 9		

Sample ID	Date	Time	Type[3]	Matrix	Count	Lab ID	Test / Preservative[1]: PFAS	Sample Comments
NBKK-B76-1DW01-AQ-DB1623	8/16/23	1120		W	2	D7902	X	
NBKK-B76-1DW02-AQ-DB1623	8/16/23	1157		W	2	D7903	X	
NBKK-B76-1DW01-SO-DB1523	8/15/23	1142		SO	1	D7904	X	
NBKK-B76-1DW02-SO-DB1623	8/16/23	1102		SO	1	D7905	X	

Relinquished by (Print/Sign): LYNDSEY KLEPPIN	Company: JACOBS	Date/Time: 8/16/23 1400	Received by (Print/Sign):	Company: BNO	Date/Time: 8/17/23 1000	
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:	
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:	
Field Project comments:			Receipt comments:			

[1] include comments in the Field Project comment field if there are method specific requirements, i.e., "WHO PCB Congener list", "PFAS – 18 analytes", or "PFAS – 29 analytes from UCMR5"

[2] Rush TAT request should be verified with the lab prior to submitting samples

[3] Client sample type, if applicable

not lift using this tag.

GIN ID:PWTA (714) 548-5904
OBS
1 CLEVELAND ST STE 200
RGINIA BEACH, VA 23462
ITED STATES US

SHIP DATE: 15AUG23
ACTWGT: 53.70 LB
CAD: 6992270/SSF02422
DIMS: 25x13x14 IN

BILL THIRD PARTY

JONATHAN THORN
BATTELLE ANALYTICAL SERVICES
141 LONGWATER DR SUITE 202
704750CH CTO-4117
NORWELL MA 02061

81) 681-5565 REF:
DEPT:

FedEx Express

1 of 2
RK# 7825 3871 9195
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MASTER

WED - 16 AUG 10:30
PRIORITY OVERNIGH
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0206
MA-US BO

XE XPUA

Thurmy
1.9

Do not lift using this tag.

ORIGIN ID:PWTA (714) 548-5904
JACOBS
5701 CLEVELAND ST STE 200
VIRGINIA BEACH, VA 23462
UNITED STATES US

SHIP DATE: 15AUG23
ACTWGT: 50.80 LB
CAD: 6992270/SSF02422
DIMS: 25x13x14 IN

BILL THIRD PARTY

Part # 156297-435 RRD12 EXP 09/23

TO JONATHAN THORN
BATTELLE ANALYTICAL SERVICES
141 LONGWATER DR SUITE 202
704750CH CTO-4117
NORWELL MA 02061

(781) 681-5565 REF:
INV:
PO:
DEPT:

FedEx Express

2 of 2
MPS# 7825 3871 9200
0263
Mstr# 7825 3871 9195

0201

WED - 16 AUG 10:30A
PRIORITY OVERNIGHT
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MA-US BOS

XE XPUA

Thurmy
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247 1 B 10.30 9200 08 16

ORIGIN ID:PWTA (000) 000-0000

JACOBS
5701 CLEVELAND ST STE 200

VIRGINIA BEACH, VA 23462
UNITED STATES US

SHIP DATE: 16AUG23
ACTWGT: 31.55 LB
CAD: 6992270/SSF02422
DIMS: 18x15x13 IN

BILL THIRD PARTY

Part # 156297-435 RRDB2 EXP 09/23

TO **BATELL**
ATTN: JONOTHAN THORN
141 LONGWATER DRIVE STE 202

NORWELL MA 02061
(781) 681-5565 REF:
INV:
PO: 704758CH DEPT:

FedEx
Express

E

J233123072501uv

THU - 17 AUG 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7825 8836 7937**

AHS
02061
MA-US BOS

XE XPUA

Thorn 4
2:30

Data Tables

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-IDW01-SO-081523
Battelle ID	D7904-FS
Sample Type	SA
Collection Date	08/15/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	12.87
Matrix	SO
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.173	0.500	1.00
PFOS	1763-23-1	1.11	D7904-FS(0)	1.000	8/22/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7904-FS(0)	1.000	8/22/2023	0.150	0.500	2.00

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-IDW01-SO-081523
Battelle ID	D7904-FS
Sample Type	SA
Collection Date	08/15/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	83	D7904-FS(0)	8/22/2023
13C4-PFHpA	85	D7904-FS(0)	8/22/2023
13C8-PFOA	80	D7904-FS(0)	8/22/2023
13C9-PFNA	81	D7904-FS(0)	8/22/2023
13C6-PFDA	83	D7904-FS(0)	8/22/2023
13C7-PFUnA	74	D7904-FS(0)	8/22/2023
13C2-PFDoA	63	D7904-FS(0)	8/22/2023
13C2-PFTeDA	51	D7904-FS(0)	8/22/2023
d3-MeFOSAA	79	D7904-FS(0)	8/22/2023
d5-EtFOSAA	72	D7904-FS(0)	8/22/2023
13C3-PFBS	84	D7904-FS(0)	8/22/2023
13C3-PFHxS	74	D7904-FS(0)	8/22/2023
13C8-PFOS	69	D7904-FS(0)	8/22/2023
13C3-HFPO-DA	83	D7904-FS(0)	8/22/2023

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-IDW02-SO-081623
Battelle ID	D7905-FS
Sample Type	SA
Collection Date	08/16/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	23.35
Matrix	SO
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.173	0.499	0.998
PFOS	1763-23-1	0.647 J	D7905-FS(0)	1.000	8/22/2023	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	D7905-FS(0)	1.000	8/22/2023	0.150	0.499	2.00

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-IDW02-SO-081623
Battelle ID	D7905-FS
Sample Type	SA
Collection Date	08/16/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	79	D7905-FS(0)	8/22/2023
13C4-PFHpA	77	D7905-FS(0)	8/22/2023
13C8-PFOA	73	D7905-FS(0)	8/22/2023
13C9-PFNA	73	D7905-FS(0)	8/22/2023
13C6-PFDA	77	D7905-FS(0)	8/22/2023
13C7-PFUnA	67	D7905-FS(0)	8/22/2023
13C2-PFDoA	64	D7905-FS(0)	8/22/2023
13C2-PFTeDA	51	D7905-FS(0)	8/22/2023
d3-MeFOSAA	62	D7905-FS(0)	8/22/2023
d5-EtFOSAA	55	D7905-FS(0)	8/22/2023
13C3-PFBS	86	D7905-FS(0)	8/22/2023
13C3-PFHxS	77	D7905-FS(0)	8/22/2023
13C8-PFOS	74	D7905-FS(0)	8/22/2023
13C3-HFPO-DA	73	D7905-FS(0)	8/22/2023

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	LZ91 IB
Battelle ID	LZ91 IB_08/22/2023
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	08/22/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	Solid
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	0.173	0.500	1.00
PFOS	1763-23-1	0.500 U	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	0.150	0.500	2.00

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	LZ91 IB
Battelle ID	LZ91 IB_08/22/2023
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	08/22/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	Solid
Sample Size	5.000
Size Unit-Basis	g

Surrogate Recoveries (%)

13C5-PFHxA	102
13C4-PFHpA	107
13C8-PFOA	99
13C9-PFNA	99
13C6-PFDA	93
13C7-PFUnA	98
13C2-PFDoA	94
13C2-PFTeDA	93
d3-MeFOSAA	117
d5-EtFOSAA	114
13C3-PFBS	119
13C3-PFHxS	112
13C8-PFOS	108
13C3-HFPO-DA	95

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	220520-01: Ottawa Sand
Battelle ID	DO705PB-FS
Sample Type	PB
Collection Date	08/21/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	0.00
Matrix	SOLID
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.173	0.499	0.998
PFOS	1763-23-1	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	DO705PB-FS(0)	1.000	8/22/2023	0.150	0.499	2.00

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	220520-01: Ottawa Sand
Battelle ID	DO705PB-FS
Sample Type	PB
Collection Date	08/21/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	111	DO705PB-FS(0)	8/22/2023
13C4-PFHpA	108	DO705PB-FS(0)	8/22/2023
13C8-PFOA	86	DO705PB-FS(0)	8/22/2023
13C9-PFNA	95	DO705PB-FS(0)	8/22/2023
13C6-PFDA	91	DO705PB-FS(0)	8/22/2023
13C7-PFUnA	86	DO705PB-FS(0)	8/22/2023
13C2-PFDoA	72	DO705PB-FS(0)	8/22/2023
13C2-PFTeDA	64	DO705PB-FS(0)	8/22/2023
d3-MeFOSAA	78	DO705PB-FS(0)	8/22/2023
d5-EtFOSAA	79	DO705PB-FS(0)	8/22/2023
13C3-PFBS	103	DO705PB-FS(0)	8/22/2023
13C3-PFHxS	88	DO705PB-FS(0)	8/22/2023
13C8-PFOS	86	DO705PB-FS(0)	8/22/2023
13C3-HFPO-DA	98	DO705PB-FS(0)	8/22/2023

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	220520-01: Ottawa Sand
Battelle ID	DO706LCS-FS
Sample Type	LCS
Collection Date	08/21/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	0.00
Matrix	SOLID
Sample Size	5.020
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	Target	Recovery	Qual	Control Limits Lower	Upper
PFHxA	307-24-4	10.8	DO706LCS-FS(0)	1.000	8/22/2023	9.96	108		70	132
PFHpA	375-85-9	9.63	DO706LCS-FS(0)	1.000	8/22/2023	9.96	97		71	131
PFOA	335-67-1	12.4	DO706LCS-FS(0)	1.000	8/22/2023	9.96	124		69	133
PFNA	375-95-1	9.47	DO706LCS-FS(0)	1.000	8/22/2023	9.96	95		72	129
PFDA	335-76-2	10.0	DO706LCS-FS(0)	1.000	8/22/2023	9.96	100		69	133
PFUnA	2058-94-8	11.8	DO706LCS-FS(0)	1.000	8/22/2023	9.96	118		64	136
PFDoA	307-55-1	11.9	DO706LCS-FS(0)	1.000	8/22/2023	9.96	119		69	135
PFTrDA	72629-94-8	12.9	DO706LCS-FS(0)	1.000	8/22/2023	9.96	130		66	139
PFTeDA	376-06-7	9.81	DO706LCS-FS(0)	1.000	8/22/2023	9.96	98		69	133
NMeFOSAA	2355-31-9	11.3	DO706LCS-FS(0)	1.000	8/22/2023	9.96	113		63	144
NEtFOSAA	2991-50-6	9.69	DO706LCS-FS(0)	1.000	8/22/2023	9.96	97		61	139
PFBS	375-73-5	12.5	DO706LCS-FS(0)	1.000	8/22/2023	9.96	126		72	128
PFHxS	355-46-4	11.2	DO706LCS-FS(0)	1.000	8/22/2023	9.96	112		67	130
PFOS	1763-23-1	11.7	DO706LCS-FS(0)	1.000	8/22/2023	9.96	117		68	136
HFPO-DA	13252-13-6	9.23	DO706LCS-FS(0)	1.000	8/22/2023	9.96	93		71	153
Adona	919005-14-4	13.7	DO706LCS-FS(0)	1.000	8/22/2023	9.96	138		61	139
9Cl-PF3ONS	756426-58-1	12.8	DO706LCS-FS(0)	1.000	8/22/2023	9.96	129		60	140
11Cl-PF3OUdS	763051-92-9	11.3	DO706LCS-FS(0)	1.000	8/22/2023	9.96	113		40	160

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	220520-01: Ottawa Sand
Battelle ID	DO706LCS-FS
Sample Type	LCS
Collection Date	08/21/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	100	DO706LCS-FS(0)	8/22/2023
13C4-PFHpA	103	DO706LCS-FS(0)	8/22/2023
13C8-PFOA	83	DO706LCS-FS(0)	8/22/2023
13C9-PFNA	95	DO706LCS-FS(0)	8/22/2023
13C6-PFDA	88	DO706LCS-FS(0)	8/22/2023
13C7-PFUnA	81	DO706LCS-FS(0)	8/22/2023
13C2-PFDoA	73	DO706LCS-FS(0)	8/22/2023
13C2-PFTeDA	67	DO706LCS-FS(0)	8/22/2023
d3-MeFOSAA	76	DO706LCS-FS(0)	8/22/2023
d5-EtFOSAA	72	DO706LCS-FS(0)	8/22/2023
13C3-PFBS	86	DO706LCS-FS(0)	8/22/2023
13C3-PFHxS	79	DO706LCS-FS(0)	8/22/2023
13C8-PFOS	78	DO706LCS-FS(0)	8/22/2023
13C3-HFPO-DA	103	DO706LCS-FS(0)	8/22/2023

Glossary of Data Qualifiers

Flag:	Application:
B	Analyte found in the sample at a concentration <10x the level found in the procedural blank
D	Dilution Run. Initial run outside the initial calibration range of the instrument
E	Estimate, result is greater than the highest concentration level in the calibration
J	Analyte detected below the Limit of Quantitation (LOQ)
MI	Significant Matrix Interference - value could not be determined.
N	Quality Control (QC) value is outside the accuracy or precision Data Quality Objective (DQO)
NA	Not Applicable
T	Holding Time (HT) exceeded
U	Analyte not detected or detected below the Detection Limit (DL) value, Limit of Detection (LOD) reported
Q	Ion ratio outside of criteria (50% difference from calibration expected ratio)

Miscellaneous Documentation

QA/QC Summary
Batch 23-1036

Project:	CTO-4117: NBK Keyport
Client Project Manager:	Juan Acaron
Parameters:	PFAS
Laboratory:	Battelle, Norwell, MA
Matrix:	SO
Data Set:	DP-23-1140
Analytical SOP:	5-369
Method Reference:	PFAS to QSM 5.3 Table B-15

Sample Custody		
Collection Date	Receipt Date	Temp (°C)
8/9 – 11, 14 – 16/2023	8/17/2023	1.9, 1.7, 2.3
Corrective Actions	None.	
Sample Storage	The samples were stored refrigerated until extraction.	
Related samples	None.	

	METHOD SUMMARIES
Sample Preparation	Solid samples were homogenized and aliquoted into extraction tubes and 2.5 mL of PFAS free water was added to the PB, LCS, and all samples with low moisture (< 20% moisture). Samples were fortified with surrogates prior to the addition of solvent. The samples were serially extracted on the Geno/Grinder with 0.3% NH_3OH in methanol. After the first extraction, the samples were centrifuged, and the extract was decanted into a new falcon tube. After the second extraction, the samples were centrifuged, and the extract was combined with the first extract. Extracts were refined with dispersive Envi-carb to remove co-extracted interferences and transferred to a 250 mL HDPE bottle. Extracts were brought to 300 mL with PFAS free water, pH was verified between 6.0 and 8.0, adjusted as needed, and processed through Weak-anion exchange (WAX) solid phase extraction (SPE) cartridges. Target analytes are eluted from the WAX SPE using 1% NH_3OH in methanol. Acetic acid was added to the extracts and fortified with internal standards. Extracts were transferred to LC-MS/MS for analysis.
Prep comments	pH of all samples prior to SPE was verified between 6 and 8 and adjusted as needed.
Analysis	PFAS were measured by liquid chromatography tandem mass spectrometry (LC-MS/MS) in the multiple reaction monitoring (MRM). An initial calibration consisting of representative target analytes, labelled analogs, and internal standards was analyzed prior to analysis to demonstrate the linear range of analysis. Calibration verification was performed at the beginning and end of 10 injections and at the end of each sequence. Target PFAS were quantified using the isotope dilution method. Samples are reported in ng/g concentrations on a dry weight basis to three (3) significant figures.
Analysis Comments	Samples analyzed on Sciex 6500 (AD) LC-MS/MS. MeFOSAA, EtFOSAA, PFHxS, and PFOS in the LCS, and field samples when detected, were found and reported as a combination of the branched and linear isomers.

QA/QC Summary
Batch 23-1036

	The following calibration points were not used in the primary or secondary transitions, when applicable, for the calibration: • 11Cl-PF3OUdS in the L1. These points were not used in this calibration as they were outside the linear range for the analyte in this analytical run. As these points are below the LOQ concentration equivalent, the reported concentrations are not above the high point of the calibrations, and these analytes use a minimum of five points for linear and six points for quadratic, there is no impact on the reported data excluding these points. Points in the middle of calibration points are not excluded from use. Secondary exceedances for calibrations, ICC, and CCV samples are not documented as the secondary transition is monitored solely for peak identification, not quantification. There is no impact on the reported data.

Holding Times	Extraction Date(s)	Analysis Date(s)
	8/21/2023	8/22/2023

Procedural Blank (PB)	A PB was prepared with this analytical batch to ensure the sample extraction and analysis methods are free of contamination.
≤ ½ the LOQ Samples >10x PB	No exceedances noted.
	No comments.

Laboratory Control Spike (LCS)	A LCS was prepared with this analytical batch. The percent recoveries of target analytes were calculated to measure accuracy.
Laboratory derived control limits for recovery	No exceedances noted.
	No comments.

Matrix Spike and Matrix Spike Duplicate (MS/MSD)	A MS/MSD was prepared with this analytical batch. The percent recoveries of target analytes were calculated to measure accuracy.
Laboratory derived control limits for recovery and <30% RPD	Project specific MS/MSD not included in this data set.
	No comments.

Extracted Internal Standard Analytes	Labelled analog compounds were added prior to extraction. The recoveries are calculated to measure extraction efficiency.
50-150% of true value	No exceedances noted.
	No comments.

Internal Standard Analytes	Labelled analog compounds were added prior to analysis.
+/- 50% of the area of the L5 calibration point.	No exceedances noted.
	No comments.

QA/QC Summary
Batch 23-1036

Initial Calibration (ICAL)	The LC-MS/MS was calibrated with multi-level calibration curve for all compounds using linear or quadratic curve fitting.
+/- 30% of true value, $R^2 \geq 0.99$	No exceedances noted.
	No comments.

Independent Calibration Check (ICC)	The independent check was run after each initial calibration to verify the calibration. This standard is from a different source than the ICAL.
+/- 30% of true value	No exceedances noted.
	No comments.

Continuing Calibration Verification (CCV)	Continuing calibration standards were run at the beginning and end of 10 injections and at the end of the sequence to ensure that initial calibration is still valid.
+/- 30% of true value	No exceedances noted.
	No comments.

Instrument Blank (IB)	Immediately following the highest standard analyzed and daily prior to sample analysis.
≤ ½ the LOQ	No exceedances noted.
	No comments.

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project Number: G25161.X1.XX.0026.000001
Preparation Batch: 23-1036
Data Set: DP-23-1140
Test Code: Master_369D

QC Parameter:	Exceed:	Justification:
Procedural Blank	0	None
PB Measurement Quality Objective	0	None
Laboratory Control Sample	0	None
Matrix Spike / Matrix Spike Duplicate Recovery	NA	None
Matrix Spike / Matrix Spike Duplicate Precision	NA	None
Extracted Internal Standard Analytes (Surrogates)	0	None
Instrument Calibration	0	None
Instrument Blank	0	None
Independent Calibration Check	0	None
Continuing Calibration Verification	0	None

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It can be done

BATTELLE - NORWELL OPERATIONS
MISCELLANEOUS DOCUMENTATION FORM

Project Title:	CTO-4117: Northwest PFAS Investigatio	**Data Set Number:**	DP-23-1140
Project Number:	G25161.X1.XX.0026.000001	**Prep Batch Number:**	23-1036
Entered By:	Vincent Urso	**Entered On:**	08/23/2023
Test Code (Matrix Type):	Master_369D(S)		

Samples that were manually integrated are noted on the Manual Integration reports with the comment “Manual” under the Integration Type columns. Changes were made due to incorrect auto integration of a peak by the data system. The analyst’s initials on this statement indicate that all integrations were reviewed and approved by the analyst performing the analysis. VU 23AUG2023

The following calibration points were not used in the primary or secondary transitions, when applicable, for the calibration:
• 11Cl-PF3OUdS in the L1.
These points were not used in this calibration as they were outside the linear range for the analyte in this analytical run. As these points are below the LOQ concentration equivalent, the reported concentrations are not above the high point of the calibrations, and these analytes use a minimum of five points for linear and six points for quadratic, there is no impact on the reported data excluding these points. Points in the middle of calibration points are not excluded from use.

Task Leader Approval:

SupervisorApproval:

PM Approval:

Digitally signed by Robert Lizotte, Jr.
Date: 2023.08.24 10:45:20 -04'00'

BATTELLE

Manual Integration Report

Created with Analyst Reporter
Printed: 24/08/2023 8:46:54 AM

Analyte: PFHxA_1 (313.0 / 269.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	13C5-PFHxA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C5-PFHxA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C5-PFHxA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C5-PFHxA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C5-PFHxA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C5-PFHxA	Baseline
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C5-PFHxA	Baseline
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C5-PFHxA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C5-PFHxA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C5-PFHxA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Baseline	13C5-PFHxA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C5-PFHxA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-081523	8/22/2023 9:58:24 PM	Baseline	13C5-PFHxA	Baseline
D7905-FS(0)	NBKK-B76-IDW02-SO-081623	8/22/2023 10:14:27 PM	Baseline	13C5-PFHxA	Baseline
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C5-PFHxA	Valley

BATTELLE

Manual Integration Report

Created with Analyst Reporter
Printed: 24/08/2023 8:46:54 AM

Analyte: PFHxA_2 (313.0 / 118.9)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	13C5-PFHxA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C5-PFHxA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C5-PFHxA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C5-PFHxA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C5-PFHxA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C5-PFHxA	Baseline
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C5-PFHxA	Baseline
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C5-PFHxA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C5-PFHxA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C5-PFHxA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C5-PFHxA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C5-PFHxA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C5-PFHxA	Baseline
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Baseline	13C5-PFHxA	Baseline
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C5-PFHxA	Valley

BATTELLE

Manual Integration Report

Created with Analyst Reporter
Printed: 24/08/2023 8:46:54 AM

Analyte: PFHpA_1 (363.1 / 319.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	13C4-PFHpA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C4-PFHpA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C4-PFHpA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C4-PFHpA	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C4-PFHpA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C4-PFHpA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C4-PFHpA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C4-PFHpA	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C4-PFHpA	Baseline
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C4-PFHpA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C4-PFHpA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C4-PFHpA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Baseline	13C4-PFHpA	Baseline
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Baseline	13C4-PFHpA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C4-PFHpA	Valley

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Analyte: PFHpA_2 (363.1 / 169.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C4-PFHpA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C4-PFHpA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C4-PFHpA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C4-PFHpA	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C4-PFHpA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C4-PFHpA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C4-PFHpA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C4-PFHpA	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C4-PFHpA	Baseline
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C4-PFHpA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C4-PFHpA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C4-PFHpA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C4-PFHpA	Baseline
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Valley	13C4-PFHpA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C4-PFHpA	Valley

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Analyte: PFOA_1 (413.0 / 369.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	13C8-PFOA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C8-PFOA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C8-PFOA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C8-PFOA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C8-PFOA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C8-PFOA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C8-PFOA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C8-PFOA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C8-PFOA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C8-PFOA	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Valley	13C8-PFOA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C8-PFOA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C8-PFOA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Valley	13C8-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C8-PFOA	Valley

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Analyte: PFOA_2 (413.0 / 169.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	13C8-PFOA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C8-PFOA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C8-PFOA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C8-PFOA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C8-PFOA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C8-PFOA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C8-PFOA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C8-PFOA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C8-PFOA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C8-PFOA	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Valley	13C8-PFOA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C8-PFOA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C8-PFOA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Valley	13C8-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C8-PFOA	Valley

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Analyte: PFNA_1 (463.0 / 419.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C9-PFNA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C9-PFNA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C9-PFNA	Baseline
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C9-PFNA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C9-PFNA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C9-PFNA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C9-PFNA	Baseline
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C9-PFNA	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C9-PFNA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C9-PFNA	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C9-PFNA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C9-PFNA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C9-PFNA	Baseline
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Valley	13C9-PFNA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C9-PFNA	Valley

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Analyte: PFNA_2 (463.0 / 219.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C9-PFNA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C9-PFNA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C9-PFNA	Baseline
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C9-PFNA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C9-PFNA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C9-PFNA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C9-PFNA	Baseline
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C9-PFNA	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C9-PFNA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C9-PFNA	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C9-PFNA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C9-PFNA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Baseline	13C9-PFNA	Baseline
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Baseline	13C9-PFNA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C9-PFNA	Valley

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Analyte: PFDA_1 (512.9 / 469.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C6-PFDA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C6-PFDA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C6-PFDA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C6-PFDA	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C6-PFDA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C6-PFDA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C6-PFDA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C6-PFDA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C6-PFDA	Baseline
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C6-PFDA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C6-PFDA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C6-PFDA	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C6-PFDA	Baseline
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C6-PFDA	Baseline
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C6-PFDA	Valley

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Manual Integration Report

Analyte: PFDA_2 (512.9 / 219.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	13C6-PFDA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C6-PFDA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C6-PFDA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C6-PFDA	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C6-PFDA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C6-PFDA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C6-PFDA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C6-PFDA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C6-PFDA	Baseline
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C6-PFDA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C6-PFDA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C6-PFDA	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	13C6-PFDA	Baseline
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C6-PFDA	Baseline
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C6-PFDA	Valley

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Analyte: PFUnA_1 (563.1 / 519.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C7-PFUnA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C7-PFUnA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C7-PFUnA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C7-PFUnA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C7-PFUnA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C7-PFUnA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C7-PFUnA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C7-PFUnA	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C7-PFUnA	Baseline
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C7-PFUnA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C7-PFUnA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C7-PFUnA	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C7-PFUnA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C7-PFUnA	Baseline
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C7-PFUnA	Valley

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Manual Integration Report

Analyte: PFUnA_2 (563.1 / 269.1)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	13C7-PFUnA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C7-PFUnA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C7-PFUnA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C7-PFUnA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C7-PFUnA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C7-PFUnA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C7-PFUnA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C7-PFUnA	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C7-PFUnA	Baseline
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C7-PFUnA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C7-PFUnA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C7-PFUnA	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Baseline	13C7-PFUnA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C7-PFUnA	Baseline
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C7-PFUnA	Valley

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Analyte: PFDoA_1 (613.1 / 569.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C2-PFDoA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C2-PFDoA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C2-PFDoA	Baseline
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C2-PFDoA	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C2-PFDoA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C2-PFDoA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C2-PFDoA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C2-PFDoA	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C2-PFDoA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C2-PFDoA	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C2-PFDoA	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C2-PFDoA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C2-PFDoA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C2-PFDoA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C2-PFDoA	Valley

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Analyte: PFDoA_2 (613.1 / 319.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C2-PFDoA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C2-PFDoA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C2-PFDoA	Baseline
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C2-PFDoA	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C2-PFDoA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C2-PFDoA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C2-PFDoA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C2-PFDoA	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C2-PFDoA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C2-PFDoA	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C2-PFDoA	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C2-PFDoA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C2-PFDoA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C2-PFDoA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C2-PFDoA	Valley

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Manual Integration Report

Analyte: PFTrDA_1 (663.0 / 619.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C2-PFTeDA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C2-PFTeDA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C2-PFTeDA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C2-PFTeDA	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C2-PFTeDA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C2-PFTeDA	Baseline
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C2-PFTeDA	Baseline
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C2-PFTeDA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C2-PFTeDA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C2-PFTeDA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C2-PFTeDA	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C2-PFTeDA	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	13C2-PFTeDA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C2-PFTeDA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C2-PFTeDA	Baseline

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Manual Integration Report

Analyte: PFTrDA_2 (663.0 / 168.9)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	13C2-PFTeDA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C2-PFTeDA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C2-PFTeDA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C2-PFTeDA	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C2-PFTeDA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C2-PFTeDA	Baseline
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C2-PFTeDA	Baseline
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C2-PFTeDA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C2-PFTeDA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C2-PFTeDA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C2-PFTeDA	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C2-PFTeDA	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	13C2-PFTeDA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C2-PFTeDA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C2-PFTeDA	Baseline

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Manual Integration Report

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Analyte: PFTeDA_1 (713.0 / 669.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	13C2-PFTeDA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C2-PFTeDA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C2-PFTeDA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C2-PFTeDA	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C2-PFTeDA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C2-PFTeDA	Baseline
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C2-PFTeDA	Baseline
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C2-PFTeDA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C2-PFTeDA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C2-PFTeDA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C2-PFTeDA	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C2-PFTeDA	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C2-PFTeDA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C2-PFTeDA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C2-PFTeDA	Baseline

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Manual Integration Report

Analyte: PFTeDA_2 (713.0 / 168.9)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	13C2-PFTeDA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C2-PFTeDA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C2-PFTeDA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C2-PFTeDA	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C2-PFTeDA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C2-PFTeDA	Baseline
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C2-PFTeDA	Baseline
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C2-PFTeDA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C2-PFTeDA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C2-PFTeDA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C2-PFTeDA	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C2-PFTeDA	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	13C2-PFTeDA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C2-PFTeDA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C2-PFTeDA	Baseline

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Analyte: PFBS_1 (298.7 / 79.9)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	13C3-PFBS	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C3-PFBS	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C3-PFBS	Baseline
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C3-PFBS	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C3-PFBS	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C3-PFBS	Baseline
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C3-PFBS	Baseline
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C3-PFBS	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C3-PFBS	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C3-PFBS	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C3-PFBS	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C3-PFBS	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	13C3-PFBS	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C3-PFBS	Baseline
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C3-PFBS	Baseline

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Analyte: PFBS_2 (298.9 / 98.8)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C3-PFBS	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C3-PFBS	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C3-PFBS	Baseline
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C3-PFBS	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C3-PFBS	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C3-PFBS	Baseline
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C3-PFBS	Baseline
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C3-PFBS	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C3-PFBS	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C3-PFBS	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C3-PFBS	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C3-PFBS	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	13C3-PFBS	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C3-PFBS	Baseline
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C3-PFBS	Baseline

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Analyte: PFHxS_1 (399.0 / 80.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	13C3-PFHxS	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C3-PFHxS	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C3-PFHxS	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C3-PFHxS	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C3-PFHxS	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C3-PFHxS	Baseline
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C3-PFHxS	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C3-PFHxS	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C3-PFHxS	Baseline
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C3-PFHxS	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C3-PFHxS	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C3-PFHxS	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Manual	13C3-PFHxS	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Baseline	13C3-PFHxS	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C3-PFHxS	Valley

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Analyte: PFHxS_2 (399.0 / 99.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C3-PFHxS	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C3-PFHxS	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C3-PFHxS	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C3-PFHxS	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C3-PFHxS	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C3-PFHxS	Baseline
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C3-PFHxS	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C3-PFHxS	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C3-PFHxS	Baseline
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C3-PFHxS	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C3-PFHxS	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C3-PFHxS	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C3-PFHxS	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C3-PFHxS	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C3-PFHxS	Valley

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Manual Integration Report

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Analyte: PFOS_1 (498.9 / 79.9)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Manual	13C8-PFOS	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C8-PFOS	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C8-PFOS	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C8-PFOS	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C8-PFOS	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C8-PFOS	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C8-PFOS	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C8-PFOS	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Baseline	13C8-PFOS	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C8-PFOS	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C8-PFOS	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C8-PFOS	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Manual	13C8-PFOS	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Manual	13C8-PFOS	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C8-PFOS	Valley

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Analyte: PFOS_2 (498.9 / 98.9)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	13C8-PFOS	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C8-PFOS	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C8-PFOS	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C8-PFOS	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C8-PFOS	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C8-PFOS	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C8-PFOS	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C8-PFOS	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C8-PFOS	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C8-PFOS	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C8-PFOS	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C8-PFOS	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Baseline	13C8-PFOS	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Baseline	13C8-PFOS	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C8-PFOS	Valley

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Manual Integration Report

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Analyte: NMeFOSAA_1 (570.1 / 419.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	d3-MeFOSAA	Baseline
LZ84	L2	8/22/2023 5:57:41 PM	Valley	d3-MeFOSAA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	d3-MeFOSAA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	d3-MeFOSAA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	d3-MeFOSAA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Valley	d3-MeFOSAA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	d3-MeFOSAA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	d3-MeFOSAA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Baseline	d3-MeFOSAA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	d3-MeFOSAA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	d3-MeFOSAA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	d3-MeFOSAA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	d3-MeFOSAA	Baseline
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	d3-MeFOSAA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	d3-MeFOSAA	Valley

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Manual Integration Report

Analyte: NMeFOSAA_2 (570.1 / 483.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	d3-MeFOSAA	Baseline
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	d3-MeFOSAA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	d3-MeFOSAA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	d3-MeFOSAA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	d3-MeFOSAA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	d3-MeFOSAA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	d3-MeFOSAA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	d3-MeFOSAA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	d3-MeFOSAA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Manual	d3-MeFOSAA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	d3-MeFOSAA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	d3-MeFOSAA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	d3-MeFOSAA	Baseline
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	d3-MeFOSAA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	d3-MeFOSAA	Valley

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Analyte: NEtFOSAA_1 (584.2 / 419.1)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	d5-EtFOSAA	Baseline
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	d5-EtFOSAA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	d5-EtFOSAA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	d5-EtFOSAA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	d5-EtFOSAA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	d5-EtFOSAA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	d5-EtFOSAA	Baseline
LZ90	L8	8/22/2023 7:33:58 PM	Valley	d5-EtFOSAA	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	d5-EtFOSAA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	d5-EtFOSAA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	d5-EtFOSAA	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	d5-EtFOSAA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	d5-EtFOSAA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	d5-EtFOSAA	Baseline
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	d5-EtFOSAA	Baseline

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Analyte: NEtFOSAA_2 (584.2 / 526.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	d5-EtFOSAA	Baseline
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	d5-EtFOSAA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	d5-EtFOSAA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	d5-EtFOSAA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Valley	d5-EtFOSAA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	d5-EtFOSAA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	d5-EtFOSAA	Baseline
LZ90	L8	8/22/2023 7:33:58 PM	Valley	d5-EtFOSAA	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	d5-EtFOSAA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	d5-EtFOSAA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	d5-EtFOSAA	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	d5-EtFOSAA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	d5-EtFOSAA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	d5-EtFOSAA	Baseline
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	d5-EtFOSAA	Baseline

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Manual Integration Report

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Analyte: HFPO-DA_1 (284.9 / 168.9)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C3-HFPO-DA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C3-HFPO-DA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C3-HFPO-DA	Baseline
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C3-HFPO-DA	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C3-HFPO-DA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C3-HFPO-DA	Baseline
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C3-HFPO-DA	Baseline
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C3-HFPO-DA	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C3-HFPO-DA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C3-HFPO-DA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C3-HFPO-DA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C3-HFPO-DA	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	13C3-HFPO-DA	Baseline
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C3-HFPO-DA	Baseline
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C3-HFPO-DA	Baseline

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Analyte: HFPO-DA_2 (284.9 / 184.9)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	13C3-HFPO-DA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C3-HFPO-DA	Valley
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C3-HFPO-DA	Baseline
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C3-HFPO-DA	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C3-HFPO-DA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C3-HFPO-DA	Baseline
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C3-HFPO-DA	Baseline
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C3-HFPO-DA	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C3-HFPO-DA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C3-HFPO-DA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C3-HFPO-DA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C3-HFPO-DA	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	13C3-HFPO-DA	Baseline
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C3-HFPO-DA	Baseline
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C3-HFPO-DA	Baseline

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Analyte: ADONA_1 (376.9 / 250.9)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C8-PFOA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C8-PFOA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C8-PFOA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C8-PFOA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C8-PFOA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C8-PFOA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C8-PFOA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C8-PFOA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C8-PFOA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C8-PFOA	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Baseline	13C8-PFOA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Manual	13C8-PFOA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	13C8-PFOA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Valley	13C8-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C8-PFOA	Valley

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Manual Integration Report

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Analyte: ADONA_2 (376.9 / 84.8)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C8-PFOA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C8-PFOA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C8-PFOA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C8-PFOA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C8-PFOA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C8-PFOA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C8-PFOA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C8-PFOA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C8-PFOA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C8-PFOA	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C8-PFOA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C8-PFOA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	13C8-PFOA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C8-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C8-PFOA	Valley

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Manual Integration Report

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Analyte: 9Cl-PF3ONS_1 (530.8 / 351.0)

Data File	AD_08222023_5-369.wiff	Result Table	23-1036
Acquisition Method	5-369_ACN.dam	Instrument Name	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C8-PFOA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C8-PFOA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C8-PFOA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C8-PFOA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C8-PFOA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C8-PFOA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C8-PFOA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C8-PFOA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C8-PFOA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C8-PFOA	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C8-PFOA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C8-PFOA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	13C8-PFOA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C8-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C8-PFOA	Valley

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Manual Integration Report

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Analyte: 9Cl-PF3ONS_2 (532.8 / 353.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C8-PFOA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C8-PFOA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C8-PFOA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C8-PFOA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C8-PFOA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C8-PFOA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C8-PFOA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C8-PFOA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C8-PFOA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C8-PFOA	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C8-PFOA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C8-PFOA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	13C8-PFOA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C8-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C8-PFOA	Valley

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Manual Integration Report

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Printed: 24/08/2023 8:46:54 AM

Analyte: 11Cl-PF3OUdS_1 (630.9 / 450.9)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C8-PFOA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C8-PFOA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C8-PFOA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C8-PFOA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C8-PFOA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C8-PFOA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C8-PFOA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C8-PFOA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C8-PFOA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C8-PFOA	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Baseline	13C8-PFOA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C8-PFOA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	13C8-PFOA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C8-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C8-PFOA	Valley

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Manual Integration Report

Created with Analyst Reporter
Printed: 24/08/2023 8:46:54 AM

Analyte: 11Cl-PF3OUdS_2 (632.9 / 452.9)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C8-PFOA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C8-PFOA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C8-PFOA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C8-PFOA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C8-PFOA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C8-PFOA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C8-PFOA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C8-PFOA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	N/A	13C8-PFOA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C8-PFOA	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	N/A	13C8-PFOA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C8-PFOA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	N/A	13C8-PFOA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	N/A	13C8-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C8-PFOA	Valley

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Analyte: 13C5-PFHxA (318.0 / 273.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C2-PFOA	Baseline
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C2-PFOA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C2-PFOA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C2-PFOA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C2-PFOA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C2-PFOA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C2-PFOA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C2-PFOA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C2-PFOA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C2-PFOA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Valley	13C2-PFOA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C2-PFOA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-081523	8/22/2023 9:58:24 PM	Baseline	13C2-PFOA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-081623	8/22/2023 10:14:27 PM	Baseline	13C2-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C2-PFOA	Baseline

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Manual Integration Report

Analyte: 13C4-PFHpA (367.1 / 322.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C2-PFOA	Baseline
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C2-PFOA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C2-PFOA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C2-PFOA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C2-PFOA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C2-PFOA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C2-PFOA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C2-PFOA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Baseline	13C2-PFOA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C2-PFOA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Valley	13C2-PFOA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C2-PFOA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Baseline	13C2-PFOA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Valley	13C2-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C2-PFOA	Baseline

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Analyte: 13C8-PFOA (421.1 / 376.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C2-PFOA	Baseline
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C2-PFOA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C2-PFOA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C2-PFOA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C2-PFOA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C2-PFOA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C2-PFOA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C2-PFOA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C2-PFOA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C2-PFOA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Valley	13C2-PFOA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C2-PFOA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C2-PFOA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Valley	13C2-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C2-PFOA	Baseline

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Analyte: 13C9-PFNA (472.1 / 427.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C2-PFOA	Baseline
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C2-PFOA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C2-PFOA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C2-PFOA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C2-PFOA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C2-PFOA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C2-PFOA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C2-PFOA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C2-PFOA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C2-PFOA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Valley	13C2-PFOA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C2-PFOA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Baseline	13C2-PFOA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Valley	13C2-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C2-PFOA	Baseline

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Analyte: 13C6-PFDA (519.1 / 474.1)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C2-PFDA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C2-PFDA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C2-PFDA	Baseline
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C2-PFDA	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C2-PFDA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C2-PFDA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C2-PFDA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C2-PFDA	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Baseline	13C2-PFDA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C2-PFDA	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Valley	13C2-PFDA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C2-PFDA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Baseline	13C2-PFDA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Baseline	13C2-PFDA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C2-PFDA	Baseline

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Manual Integration Report

Analyte: 13C7-PFUnA (570.0 / 525.1)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C2-PFDA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C2-PFDA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C2-PFDA	Baseline
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C2-PFDA	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C2-PFDA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C2-PFDA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C2-PFDA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C2-PFDA	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Baseline	13C2-PFDA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C2-PFDA	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Valley	13C2-PFDA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C2-PFDA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C2-PFDA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Baseline	13C2-PFDA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C2-PFDA	Baseline

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Manual Integration Report

Analyte: 13C2-PFDoA (615.1 / 570.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C2-PFDA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C2-PFDA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C2-PFDA	Baseline
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C2-PFDA	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C2-PFDA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C2-PFDA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C2-PFDA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C2-PFDA	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C2-PFDA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C2-PFDA	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Baseline	13C2-PFDA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C2-PFDA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C2-PFDA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Valley	13C2-PFDA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C2-PFDA	Baseline

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Analyte: 13C2-PFTeDA (715.2 / 670.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C2-PFDA	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C2-PFDA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C2-PFDA	Baseline
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C2-PFDA	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C2-PFDA	Valley
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C2-PFDA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C2-PFDA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C2-PFDA	Baseline
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C2-PFDA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C2-PFDA	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Baseline	13C2-PFDA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C2-PFDA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C2-PFDA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Valley	13C2-PFDA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C2-PFDA	Baseline

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Analyte: 13C3-PFBS (302.1 / 79.9)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C4-PFOS	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Baseline	13C4-PFOS	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C4-PFOS	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C4-PFOS	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C4-PFOS	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C4-PFOS	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C4-PFOS	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C4-PFOS	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C4-PFOS	Baseline
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Baseline	13C4-PFOS	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Valley	13C4-PFOS	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C4-PFOS	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C4-PFOS	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Baseline	13C4-PFOS	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C4-PFOS	Valley

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Analyte: 13C3-PFHxS (402.1 / 79.9)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C4-PFOS	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C4-PFOS	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C4-PFOS	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C4-PFOS	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C4-PFOS	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C4-PFOS	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C4-PFOS	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C4-PFOS	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Baseline	13C4-PFOS	Baseline
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C4-PFOS	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Baseline	13C4-PFOS	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C4-PFOS	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C4-PFOS	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Valley	13C4-PFOS	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C4-PFOS	Valley

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Analyte: 13C8-PFOS (507.1 / 79.9)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C4-PFOS	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C4-PFOS	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C4-PFOS	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C4-PFOS	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C4-PFOS	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C4-PFOS	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C4-PFOS	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C4-PFOS	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C4-PFOS	Baseline
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C4-PFOS	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Baseline	13C4-PFOS	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C4-PFOS	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C4-PFOS	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Valley	13C4-PFOS	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C4-PFOS	Valley

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Manual Integration Report

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Analyte: d3-MeFOSAA (573.2 / 419.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	13C4-PFOS	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C4-PFOS	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C4-PFOS	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C4-PFOS	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C4-PFOS	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C4-PFOS	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Valley	13C4-PFOS	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Valley	13C4-PFOS	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C4-PFOS	Baseline
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C4-PFOS	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Valley	13C4-PFOS	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C4-PFOS	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Baseline	13C4-PFOS	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Valley	13C4-PFOS	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Valley	13C4-PFOS	Valley

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Analyte: d5-EtFOSAA (589.2 / 419.0)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Baseline	13C4-PFOS	Valley
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C4-PFOS	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Valley	13C4-PFOS	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Baseline	13C4-PFOS	Valley
LZ87	L5	8/22/2023 6:45:50 PM	Valley	13C4-PFOS	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Valley	13C4-PFOS	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C4-PFOS	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C4-PFOS	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C4-PFOS	Baseline
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C4-PFOS	Baseline
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Baseline	13C4-PFOS	Baseline
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Valley	13C4-PFOS	Baseline
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Valley	13C4-PFOS	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Baseline	13C4-PFOS	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C4-PFOS	Valley

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Manual Integration Report

Created with Analyst Reporter
Printed: 23/08/2023 10:49:05 AM

Analyte: 13C3-HFPO-DA (286.9 / 168.9)

Data File	AD_08222023_5-369.wiff	**Result Table**	23-1036_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/22/2023 5:41:38 PM	Valley	13C2-PFOA	Baseline
LZ84	L2	8/22/2023 5:57:41 PM	Valley	13C2-PFOA	Baseline
LZ85	L3	8/22/2023 6:13:44 PM	Baseline	13C2-PFOA	Valley
LZ86	L4	8/22/2023 6:29:47 PM	Valley	13C2-PFOA	Baseline
LZ87	L5	8/22/2023 6:45:50 PM	Baseline	13C2-PFOA	Baseline
LZ88	L6	8/22/2023 7:01:53 PM	Baseline	13C2-PFOA	Valley
LZ89	L7	8/22/2023 7:17:57 PM	Baseline	13C2-PFOA	Valley
LZ90	L8	8/22/2023 7:33:58 PM	Baseline	13C2-PFOA	Valley
LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	Valley	13C2-PFOA	Valley
LZ92 ICC	ICC	8/22/2023 8:05:55 PM	Valley	13C2-PFOA	Valley
DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	Valley	13C2-PFOA	Valley
DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	Baseline	13C2-PFOA	Valley
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/2023 9:58:24 PM	Baseline	13C2-PFOA	Valley
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/2023 10:14:27 PM	Baseline	13C2-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 11:18:41 PM	Baseline	13C2-PFOA	Baseline

Example Calculation for PFAS

Calculation of final concentration from area:

$$Concentration = \left[\frac{PA - b}{m}\right] * C_{IS} * DF/S$$

Where:

PA = Area of target / area of internal standard
b = y intercept from calibration curve
CIS = concentration of internal standard (ng)
m = slope of calibration
DF = dilution factor
S = Sample Size

Sample ID:	DO706LCS-FS(0)
Client Sample ID:	220520-01: Ottawa Sand
Sample Size:	5.02
Units:	g
Dilution Factor:	1.000
Target Analyte:	PFHxA_1
MRM Transition:	313.0 / 269.0
Data file:	AD_08222023_5-369.wiff
Result table:	23-1036
Area:	4,236,743.87
IS Name:	13C5-PFHxA
IS Area:	1,561,236.12
IS Amount (ng):	25
y-intercept:	-0.01012
slope:	1.2546

$$\text{Concentration} = \frac{[(4236743.87/1561236.12) - -0.01012]}{1.2546} * 25 * 1 / 5.02$$

ng/g = 10.8

Concentration may vary based on rounding.

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Preparation Batch: 23-1036
Data Set: DP-23-1140

		DO705PB-FS (220520-01: Ottawa Sand)	DO706LCS-FS (220520-01: Ottawa Sand)	D7904-FS (NBKK-B76-IDW01-SO-081523)	D7905-FS (NBKK-B76-IDW02-SO-081623)
PFHxA	307-24-4	-	L	-	-
PFHpA	375-85-9	-	L	-	-
PFOA	335-67-1	-	L	-	-
PFNA	375-95-1	-	L	-	-
PFDA	335-76-2	-	L	-	-
PFUnA	2058-94-8	-	L	-	-
PFDoA	307-55-1	-	L	-	-
PFTrDA	72629-94-8	-	L	-	-
PFTeDA	376-06-7	-	L	-	-
NMeFOSAA	2355-31-9	-	L/Br	-	-
NEtFOSAA	2991-50-6	-	L/Br	-	-
PFBS	375-73-5	-	L	-	-
PFHxS	355-46-4	-	L/Br	-	-
PFOS	1763-23-1	-	L/Br	L/Br	L/Br
HFPO-DA	13252-13-6	-	L	-	-
Adona	919005-14-4	-	L	-	-
9Cl-PF3ONS	756426-58-1	-	L	-	-
11Cl-PF3OUdS	763051-92-9	-	L	-	-

"L" :Linear
"Br": branched
"L/Br": Linear/Branched
"-": Not detected

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

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			Passing criteria = 50% to 150% of internal standard area (compared to mid-point of calibration)							
Sample Name	Sample ID	Analysis Date	13C3-PFBA		13C2-PFOA		13C2-PFDA		13C4-PFOS	
LZ87	L5	8/22/23 18:45	-		1,866,054.52		881,908.07		77,695.04	
		Lower	-		933,027.26		440,954.04		38,847.52	
		Upper	-		2,799,081.78		1,322,862.11		116,542.56	

Sample Name	Sample ID	Analysis Date	13C3-PFBA	Qual	User	13C2-PFOA	Qual	User	13C2-PFDA	Qual	User	13C4-PFOS	Qual	User
LZ83	L1	8/22/23 17:41	-			1,814,199.27			869,884.35			71,958.99		
LZ84	L2	8/22/23 17:57	-			1,934,236.80			901,095.35			83,509.09		
LZ85	L3	8/22/23 18:13	-			1,726,185.21			830,336.19			72,789.17		
LZ86	L4	8/22/23 18:29	-			1,883,815.12			815,300.50			77,295.47		
LZ87	L5	8/22/23 18:45	-			1,866,054.52			881,908.07			77,695.04		
LZ88	L6	8/22/23 19:01	-			1,629,307.43			912,246.66			70,027.35		
LZ89	L7	8/22/23 19:17	-			1,475,181.23			715,944.16			63,289.98		
LZ90	L8	8/22/23 19:33	-			1,241,023.33			664,825.58			53,110.03		
LZ91 IB	Instrument Blank	8/22/23 19:49	-			1,715,413.09			849,482.95			63,529.99		
LZ92 ICC	ICC	8/22/23 20:05	-			1,574,414.89			792,833.63			67,440.08		
DO705PB-FS(0)	Procedural Blank	8/22/23 21:26	-			1,610,541.66			880,020.16			71,426.50		
DO706LCS-FS(0)	Laboratory Control Sample	8/22/23 21:42	-			1,508,350.32			828,030.38			71,729.10		
D7904-FS(0)	NBKK-B76-IDW01-SO-0815823	8/22/23 21:58	-			1,581,190.37			808,194.10			69,699.37		
D7905-FS(0)	NBKK-B76-IDW02-SO-0816823	8/22/23 22:14	-			1,847,054.88			887,985.79			78,583.23		
LZ87 CCV	CCV	8/22/23 23:18	-			1,607,399.01			758,162.16			70,503.02		

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Summary Asymmetry Report

Created with Analyst Reporter
Printed: 23/08/2023 9:27:23 AM

Sample Name	LZ87	**Injection Vial**	7
Sample ID	L5	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 6:45:50 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Asymmetry Factor	Passing Range
PFHxA_1	313.0 / 269.0	6.53	1.02	0.8 – 1.5
PFBS_1	298.7 / 79.9	6.48	1.02	0.8 – 1.5

Sample Name	LZ88	**Injection Vial**	8
Sample ID	L6	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:01:53 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Spectra Acquisition Rate	Passing Range
PFHxA_1	313.0 / 269.0	6.53	46	>10
PFHxA_2	313.0 / 118.9	6.52	27	>10
PFHpA_1	363.1 / 319.0	7.25	33	>10
PFHpA_2	363.1 / 169.0	7.25	31	>10
PFOA_1	413.0 / 369.0	7.81	47	>10
PFOA_2	413.0 / 169.0	7.81	55	>10
PFNA_1	463.0 / 419.0	8.30	44	>10
PFNA_2	463.0 / 219.0	8.30	47	>10
PFDA_1	512.9 / 469.0	8.77	42	>10
PFDA_2	512.9 / 219.0	8.77	36	>10
PFUnA_1	563.1 / 519.0	9.24	53	>10
PFUnA_2	563.1 / 269.1	9.24	64	>10
PFDoA_1	613.1 / 569.0	9.70	36	>10
PFDoA_2	613.1 / 319.0	9.70	62	>10
PFTrDA_1	663.0 / 619.0	10.13	46	>10
PFTrDA_2	663.0 / 168.9	10.13	34	>10
PFTeDA_1	713.0 / 669.0	10.53	54	>10
PFTeDA_2	713.0 / 168.9	10.53	43	>10
PFBS_1	298.7 / 79.9	6.48	40	>10
PFBS_2	298.9 / 98.8	6.48	34	>10
PFHxS_1	399.0 / 80.0	7.94	46	>10
PFHxS_2	399.0 / 99.0	7.93	45	>10
PFOS_1	498.9 / 79.9	8.95	45	>10
PFOS_2	498.9 / 98.9	8.95	42	>10
NMeFOSAA_1	570.1 / 419.0	8.78	39	>10
NMeFOSAA_2	570.1 / 483.0	8.78	42	>10
NEtFOSAA_1	584.2 / 419.1	8.96	42	>10
NEtFOSAA_2	584.2 / 526.0	8.96	29	>10
HFPO-DA_1	284.9 / 168.9	6.79	75	>10
HFPO-DA_2	284.9 / 184.9	6.79	38	>10
ADONA_1	376.9 / 250.9	7.45	51	>10
ADONA_2	376.9 / 84.8	7.45	50	>10
9Cl-PF3ONS_1	530.8 / 351.0	9.28	47	>10
9Cl-PF3ONS_2	532.8 / 353.0	9.28	54	>10
11Cl-PF3OUdS_1	630.9 / 450.9	10.18	55	>10
11Cl-PF3OUdS_2	632.9 / 452.9	10.18	45	>10

Sample Name	LZ88	**Injection Vial**	8
Sample ID	L6	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:01:53 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Spectra Acquisition Rate	Passing Range
13C5-PFHxA	318.0 / 273.0	6.51	70	>10
13C4-PFHpA	367.1 / 322.0	7.23	51	>10
13C8-PFOA	421.1 / 376.0	7.79	35	>10
13C9-PFNA	472.1 / 427.0	8.28	48	>10
13C6-PFDA	519.1 / 474.1	8.75	44	>10
13C7-PFUnA	570.0 / 525.1	9.22	46	>10
13C2-PFDoA	615.1 / 570.0	9.68	46	>10
13C2-PFTeDA	715.2 / 670.0	10.51	56	>10
13C3-PFBS	302.1 / 79.9	6.46	43	>10
13C3-PFHxS	402.1 / 79.9	7.92	48	>10
13C8-PFOS	507.1 / 79.9	8.94	31	>10
d3-MeFOSAA	573.2 / 419.0	8.76	33	>10
d5-EtFOSAA	589.2 / 419.0	8.95	48	>10
13C3-HFPO-DA	286.9 / 168.9	6.78	56	>10

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Precision and Bias at the LOQ for PFAS in Solids

Analyte	CAS No.	Average (ng/g)	ST DEV	2 Sigma	n [1]
PFBA	375-22-4	10.37	1.2279	2.46	9
PFPeA	2706-90-3	9.44	0.8776	1.76	9
PFHxA	307-24-4	10.22	1.0229	2.05	33
PFHpA	375-85-9	10.12	1.0454	2.09	33
PFOA	335-67-1	10.06	1.0528	2.11	33
PFNA	375-95-1	10.01	1.3090	2.62	33
PFDA	335-76-2	10.04	1.0884	2.18	33
PFUnA	2058-94-8	9.83	0.9538	1.91	33
PFDoA	307-55-1	10.67	0.8012	1.60	33
PFTrDA	72629-94-8	10.31	1.1482	2.30	33
PFTeDA	376-06-7	10.94	1.0435	2.09	33
NMeFOSAA	2355-31-9	9.85	1.3511	2.70	34
NEtFOSAA	2991-50-6	10.20	1.3334	2.67	34
PFOSA	754-91-6	9.79	0.5648	1.13	9
PFBS	375-73-5	10.07	0.8377	1.68	33
PFPeS	2706-91-4	9.53	0.6453	1.29	7
PFHxS	355-46-4	10.22	0.9246	1.85	33
PFHpS	375-92-8	9.70	0.4462	0.89	9
PFOS	1763-23-1	10.21	1.1884	2.38	33
PFNS	68259-12-1	9.13	0.7183	1.44	7
PFDS	335-77-3	9.35	0.7479	1.50	9
4:2FTS	757124-72-4	9.81	0.9840	1.97	7
6:2FTS	27619-97-2	9.94	2.4102	4.82	9
8:2FTS	39108-34-4	9.95	2.0273	4.05	9
HFPO-DA	13252-13-6	11.63	1.1159	2.23	19
Adona	919005-14-4	10.35	1.2099	2.42	19
11Cl-PF3OUdS	763051-92-9	10.34	1.4687	2.94	19
9Cl-PF3ONS	756426-58-1	9.97	0.9943	1.99	19

[1] Minimum of 20 samples required per QAM for determination of uncertainty, results including less than 20 data points are estimated.

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MDL Values calculated based on 40 CFR 136 (2017)
Compliant with DoD QSM 5.3 Table B-15
Recalculated 9/28/2021
Matrix: Solid (based on 5 g sample, dry weight basis)
Calculated to 3 significant figures

Analyte	CAS No.	MDL (ng/g)	LOD (ng/g)	LOQ (ng/g)
NFDHA	151772-58-6	0.155	0.500	2.00
PFEESA	113507-82-7	0.136	0.500	2.00
PFMPA	377-73-1	0.195	0.500	2.00
PFMBA	863090-89-5	0.173	0.500	2.00
PFBA	375-22-4	0.219	0.500	2.00
PFPeA	2706-90-3	0.205	0.500	1.00
PFHxA	307-24-4	0.178	0.500	1.00
PFHpA	375-85-9	0.168	0.500	1.00
PFOA	335-67-1	0.214	0.500	1.00
PFNA	375-95-1	0.157	0.500	1.00
PFDA	335-76-2	0.158	0.500	1.00
PFUnA	2058-94-8	0.156	0.500	1.00
PFDoA	307-55-1	0.160	0.500	1.00
PFTrDA	72629-94-8	0.161	0.500	1.00
PFTeDA	376-06-7	0.162	0.500	2.00
PFHxDA	67905-19-5	0.162	0.500	2.00
PFODA	16517-11-6	0.166	0.500	2.00
NMeFOSAA	2355-31-9	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.165	0.500	2.00
NMeFOSA	31506-32-8	0.197	0.500	2.00
NEtFOSA	4151-50-2	0.162	0.500	2.00
NMeFOSE	24448-09-7	0.166	0.500	2.00
NEtFOSE	1691-99-2	0.196	0.500	2.00
PFOSA	754-91-6	0.208	0.500	1.00
PFBS	375-73-5	0.171	0.500	1.00
PFPeS	2706-91-4	0.156	0.500	2.00
PFHxS	355-46-4	0.173	0.500	1.00
PFHpS	375-92-8	0.162	0.500	1.00
PFOS	1763-23-1	0.175	0.500	1.00
PFNS	68259-12-1	0.150	0.500	2.00
PFDS	335-77-3	0.154	0.500	1.00
PFDoS	79780-39-5	0.142	0.500	2.00
4:2FTS	757124-72-4	0.179	0.500	2.00
6:2FTS	27619-97-2	0.223	0.500	2.00

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Analyte	CAS No.	MDL (ng/g)	LOD (ng/g)	LOQ (ng/g)
8:2FTS	39108-34-4	0.162	0.500	2.00
10:2FTS	108026-35-3	0.161	0.500	2.00
3:3 FTCA	356-02-5	0.226	0.500	2.00
5:3 FTCA	914637-49-3	0.177	0.500	2.00
7:3 FTCA	812-70-4	0.170	0.500	2.00
HFPO-DA	13252-13-6	0.159	0.500	2.00
Adona	919005-14-4	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.150	0.500	2.00

Analytes italicized in bold are included on our DoD ELAP scope of accreditation.

Analytical Transitions for PFAS in non-potable water, solid, and tissue

Analyte	CAS No.	Type	Primary Transition	Secondary Transition
NFDHA	151772-58-6	Target	295.0 / 201.0	NA
PFEESA	113507-82-7	Target	315.0 / 135.0	NA
PFMPA	377-73-1	Target	229.0 / 85.0	NA
PFMBA	863090-89-5	Target	279.0 / 85.0	NA
PFBA	375-22-4	Target	213.0 / 169.0	NA
PFPeA	2706-90-3	Target	263.0 / 219.0	NA
PFHxA	307-24-4	Target	313.0 / 269.0	313.0 / 119.0
PFHpA	375-85-9	Target	363.0 / 319.0	363.0 / 169.0
PFOA	335-67-1	Target	413.0 / 369.0	413.0 / 169.0
PFNA	375-95-1	Target	463.0 / 419.0	463.0 / 219.0
PFDA	335-76-2	Target	513.0 / 469.0	513.0 / 219.0
PFUnA	2058-94-8	Target	563.0 / 519.0	563.0 / 269.0
PFDoA	307-55-1	Target	613.0 / 569.0	613.0 / 319.0
PFTrDA	72629-94-8	Target	663.0 / 619.0	663.0 / 169.0
PFTeDA	376-06-7	Target	713.0 / 669.0	713.0 / 169.0
PFHxDA	67905-19-5	Target	813.0 / 769.0	813.0 /119.0
PFODA	16517-11-6	Target	913.0 / 869.0	913.0 / 319.0
NMeFOSAA	2355-31-9	Target	570.0 / 419.0	570.0 / 512.0
NEtFOSAA	2991-50-6	Target	584.0 / 419.0	584.0 / 483.0
NMeFOSA	31506-32-8	Target	512.0 / 219.0	512.0 / 169.0
NEtFOSA	4151-50-2	Target	526.0 / 219.0	526.0 / 169.0
NMeFOSE	24448-09-7	Target	616.0 / 59.0	NA
NEtFOSE	1691-99-2	Target	630.0 / 59.0	NA
PFOSA	754-91-6	Target	498.0 / 78.0	498.0 / 83.0
PFBS	375-73-5	Target	299.0 / 80.0	299.0 / 99.0
PFPeS	2706-91-4	Target	349.0 / 99.0	349.0 / 80.0
PFHxS	355-46-4	Target	399.0 / 80.0	399.0 / 99.0
PFHpS	375-99-6	Target	449.0 / 80.0	449.0 / 99.0
PFOS	1763-23-1	Target	499.0 / 80.0	499.0 / 99.0
PFNS	98789-57-2	Target	549.0 / 99.0	549.0 / 80.0
PFDS	2806-15-7	Target	599.0 / 80.0	599.0 / 99.0

Analyte	CAS No.	Type	Primary Transition	Secondary Transition
PFDoS	79780-39-5	Target	669.0 / 80.0	699.0 / 99.0
4:2FTS	757124-72-4	Target	327.0 / 307.0	327.0 / 80.0
6:2FTS	27619-97-2	Target	427.0 / 407.0	427.0 / 81.0
8:2FTS	39108-34-4	Target	527.0 / 507.0	527.0 / 487.0
10:2FTS	120226-60-0	Target	627.0 / 607.0	NA
3:3 FTCA	356-02-5	Target	241.0 / 177.0	NA
5:3 FTCA	914637-49-3	Target	341.0 / 237.0	NA
7:3 FTCA	812-70-4	Target	441.0 / 337.0	NA
HFPO-DA	13252-13-6	Target	285.0 /169.0	285.0 /118.8
Adona	919005-14-4	Target	377.0 / 251.0	377.0 / 85.0
9Cl-PF3ONS	756426-58-1	Target	531.0 / 351.0	531.0 / 83.0
11Cl-PF3OUdS	763051-92-9	Target	631.0 / 451.0	631.0 / 83.0
$^{13}C_4$-PFBA	NA	SIS[1]	217.0 / 172.0	NA
$^{13}C_5$-PFPeA	NA	SIS[1]	268.0 / 223.0	NA
$^{13}C_5$-PFHxA	NA	SIS[1]	318.0 / 273.0	NA
$^{13}C_4$-PFHpA	NA	SIS[1]	367.0 / 322.0	NA
$^{13}C_8$-PFOA	NA	SIS[1]	421.0 / 376.0	NA
$^{13}C_9$-PFNA	NA	SIS[1]	472.0 / 427.0	NA
$^{13}C_6$-PFDA	NA	SIS[1]	519.0 / 474.0	NA
$^{13}C_7$-PFUnA	NA	SIS[1]	570.0 / 525.0	NA
$^{13}C_2$-PFDoA	NA	SIS[1]	615.0 / 570.0	NA
$^{13}C_2$-PFTeDA	NA	SIS[1]	715.0 / 670.0	NA
$^{13}C_2$-PFHxDA	NA	SIS[1]	815.0 / 770.0	NA
d_3-MeFOSAA	NA	SIS[1]	573.0 / 41//9.0	NA
d_5-EtFOSAA	NA	SIS[1]	589.0 / 419.0	NA
d_3-MeFOSA	NA	SIS[1]	515.0 / 219.0	NA
d_5-EtFOSA	NA	SIS[1]	531.0 / 219.0	NA
d_7-MeFOSE	NA	SIS[1]	623.0 / 59.0	NA
d_9-EtFOSE	NA	SIS[1]	639.0 / 59.0	NA
$^{13}C_8$-FOSA	NA	SIS[1]	506.0 / 78.0	NA
$^{13}C_3$-PFBS	NA	SIS[1]	302.0 / 99.0	NA

Analyte	CAS No.	Type	Primary Transition	Secondary Transition
$^{13}C_3$-PFHxS	NA	SIS[1]	402.0 / 99.0	NA
$^{13}C_8$-PFOS	NA	SIS[1]	507.0 / 99.0	NA
$^{13}C_2$-4:2FTS	NA	SIS[1]	329.0 / 81.0	NA
$^{13}C_2$-6:2FTS	NA	SIS[1]	429.0 / 81.0	NA
$^{13}C_2$-8:2FTS	NA	SIS[1]	529.0 / 81.0	NA
$^{13}C_3$-HFPO-DA	NA	SIS[1]	287.0 / 169.0	NA
$^{13}C_3$-PFBA	NA	IS[2]	216.0 / 172.0	NA
$^{13}C_2$-PFOA	NA	IS[2]	415.0 / 370.0	NA
$^{13}C_2$-PFDA	NA	IS[2]	515.0 / 470.0	NA
$^{13}C_4$-PFOS	NA	IS[2]	503.0 / 99.0	NA

[1] – extracted internal standard (surrogate)
[2] – injection internal standard

Solids Calibration to Sample Equivalents

ICAL (ng/mL)	PIV (mL)[1]	DF[2]	Sample Size (g)	Sample Equivalent (ng/g_Dry)[3]
0.05	5	1	5.00	0.050
0.125	5	1	5.00	0.125
0.250	5	1	5.00	0.250
0.500	5	1	5.00	0.500
1.000	5	1	5.00	1.000
2.500	5	1	5.00	2.500
10.000	5	1	5.00	10.000
25.000	5	1	5.00	25.000
50.000	5	1	5.00	50.000

[1] - Nominal PIV, not used in final calculations

[2] - base level dilution as part of the extraction procedure

[3] - calculated equivalent of a sample based on the ICAL concentration

QTRAP 6500
Preventive Maintenance Checklist

Preventive Maintenance Date:	06APR2023
Request ID:	42191
Company Name:	BATTELLE
Instrument ID:	AD
Instrument Model:	6500 QTRAP
Instrument Serial Number:	BL27151408

☑ **PASS** ☐ **FAIL***

***Any failed result will be resolved in a separate Service Call Request ID:** _____

Preventive Maintenance is performed every year, unless otherwise specified in the Service Contract. It is designed to help maintaining instrument performance and identifying potential instrument deficiencies.

Remarks: THIS REPORT IS AFTER ALL THE REPAIRS AFTER A FAILED PRE PM NO PRE PM DATA ON THIS FORM ALL PRE ON FAILED DOCUMENT

Performed By: chris laflamme Digitally signed by chris laflamme DN: cn=chris laflamme, o=zefsci, ou=service, email=CHRIS@ZEFSCI.COM, c=US Date: 2023.04.07 10:17:44 -04'00' **Date:** 07APR2023

Preventive Maintenance Checklist

Pre-Maintenance Performance Evaluation:

☐ Consult Customer concerning the unit overall performance

☐ Check Logbook for Services recently performed, if available ☐ N/A

☐ Check Vacuum Pressure. Record Results. ☐ Pass ☐ Fail

CAD Settings	Vacuum Reading (x 10^{-5} Torr)	Acceptance Criteria
☐ CAD 0		0.2 to 1.1 x 10^{-5} Torr
☐ CAD 12		1.8 to 4.1 x 10^{-5} Torr

☐ Check for Front end contamination symptoms. Run Q1 POS using POS PPG 2e-7M for a few mins

- Acceptance criteria: No degradation or Sensitivity drop ☐ Pass ☐ Fail

☐ Check for Q3 contamination symptoms. Run Q3 POS using POS PPG 2e-7M for a few mins

- Acceptance criteria: No degradation or Sensitivity drop ☐ Pass ☐ Fail

☐ Perform PPG Tests. Record Results.

Positive Mode: Masses for the peaks of interest are: 59.050, 175.133, 500.380, 616.464, 906.673, 1254.925, 1545.134,1952.427.

High Mass Tests

☐ Perform High Mass Q1 POS using POS PPG 2e-7M (500:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q1 Intensity		Q1 Width Value	Width Specs
	Value	Spec		
Q1 500.380		Read Only		Read Only
Q1 616.464		Read Only		Read Only
Q1 906.673		Read Only		Read Only
Q1 1952.427		Read Only		Read Only

☐ Perform High Mass Q3 POS using POS PPG 2e-7M (500:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q3 Intensity		Q3 Width Value	Width Specs
	Value	Spec		
Q3 500.380		Read Only		Read Only
Q3 616.464		Read Only		Read Only
Q3 906.673		Read Only		Read Only
Q3 1952.427		Read Only		Read Only

Low Mass Tests

☐ Perform Low Mass Q1 POS using POS PPG 2e-7M (500:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q1 Intensity		Q1 Width Value	Width Specs
	Value	Spec		
Q1 175.133		Read Only		Read Only
Q1 500.380		Read Only		Read Only
Q1 616.464		Read Only		Read Only
Q1 906.673		Read Only		Read Only

☐ Perform Low Mass Q3 POS using POS PPG 2e-7M (500:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q3 Intensity		Q3 Width Value	Width Specs
	Value	Spec		
Q3 175.133		Read Only		Read Only
Q3 500.380		Read Only		Read Only
Q3 616.464		Read Only		Read Only
Q3 906.673		Read Only		Read Only

Maintenance's Check/Clean/Replace Activities:

☑ Check Cooling Fans for Turbo Pumps while MS is ON

☑ Check QJet and QPS tuning voltage for reference

☑ Check AC input Voltage while MS is OFF. Record Result: 230 ☑ Pass ☐ Fail

- Acceptance Criteria: 200-240VAC
- If Out-of-Range, notify customer

☑ Clean Interface

- ☑ Curtain Plate
- ☑ Orifice Plate
- ☑ QJet
- ☑ Q0 Rods

☑ Check Q0 for signs of arcing

☑ Clean Q0

☑ Check Roughing Pump Oil

- ☐ Top up if necessary (if oil level is below minimum) ☑ N/A
- ☑ Replace if necessary (if oil is 1 year old or very dark) ☐ N/A

☐ Clean or ☑ Replace Oil Exhaust Filter, as necessary (and if applicable. ☐ N/A

☑ Replace 4 Air Filters at the bottom of the mass spectrometer

☑ Allow sufficient time to pump down (overnight if possible)

☑ Perform Maintenance on Turbo V source

☑ Replace Electrode, if necessary ☐ N/A

☑ Check Turbo heaters resistances

☑ Check and/or ☑ Clean diverter valve's rotor and stator, if used ☐ N/A

Post-Maintenance Performance Tests:

☑ Check if Temperature reaches setpoint of 500°C with TIS Probe installed ☑ Pass ☐ Fail

- Acceptance Criteria: temperature reaches setpoint

☐ Check if Temperature reaches setpoint of 500°C with APCI Probe (if installed) ☐ Pass ☐ Fail ☑ N/A

- Acceptance Criteria: temperature reaches setpoint

☑ Set-up Sample for Infusion

☑ Check spray and adjust sprayer's position of the Ion Drive Turbo V source

☑ Check Multiplier Voltage; Optimize if necessary. Record Final Multiplier Voltage: 1900/2200

☑ Check Vacuum Pressure. Record Results. ☑ Pass ☐ Fail

CAD Settings	Vacuum Reading (x 10^{-5} Torr)	Acceptance Criteria
☑ CAD 0	1.0 E-5	0.2 to 1.1 x 10^{-5} Torr
☑ CAD 12	3.5 E-5	1.8 to 4.1 x 10^{-5} Torr

☑ Check for Front end contamination symptoms. Run Q1 POS using POS PPG 2e-7M for a few mins

- Acceptance criteria: No degradation or Sensitivity drop ☑ Pass ☐ Fail

☑ Check for Q3 contamination symptoms. Run Q3 POS using POS PPG 2e-7M for a few mins

- Acceptance criteria: No degradation or Sensitivity drop ☑ Pass ☐ Fail

☑ Perform PPG Tests and Scans. Record Results.

High Mass Tests

Positive Mode: Masses for the peaks of interest are: 59.050, 175.133, 500.380, 616.464, 906.673, 1254.925, 1545.134,1952.427. Mass calibrate to less than 0.1 amu.

Negative Mode: Masses for the peaks of interest are: 44.998, 411.259, 585.385, 933.636, 1223.845, 1572.097, 1863.306, 1979.389. Mass calibrate to less than 0.1 amu.

☑ Perform High Mass Q1 POS ☑ Pass ☐ Fail

Use POS PPG 2e-7M (500:1). Scan Rate 10 Da/s. Record 10 MCA.

Mass	Q1 Intensity		Q1 Width Value	Width Specs
	Value	Spec		
Q1 500.380	4.95 E7	≥ 1.4e7	0.7750	0.6 to 0.8
Q1 616.464	2.05 E7	≥ 9.0e6	0.7646	0.6 to 0.8
Q1 906.673	3.88 E7	≥ 3.3e7	0.7579	0.6 to 0.8
Q1 1952.427	6.45	≥ 6.4e5	0.8000	0.6 to 0.8

☑ Perform High Mass Q3 POS ☑ Pass ☐ Fail

Use POS PPG 2e-7M (500:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q3 Intensity		Q3 Width Value	Width Specs
	Value	Spec		
Q3 500.380	4.93 E7	≥ 1.4e7	0.7270	0.6 to 0.8
Q3 616.464	3.44 E7	≥ 9.0e6	0.7197	0.6 to 0.8
Q3 906.673	5.91 E7	≥ 3.3e7	0.7052	0.6 to 0.8
Q3 1952.427	6.45 E5	≥ 6.4e5	0.7889	0.6 to 0.8

☑ Perform High Mass Q1 NEG ☑ Pass ☐ Fail

Use NEG PPG 3 x 10-5 M (10:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q1 Intensity		Q1 Width Value	Width Specs
	Value	Spec		
Q1 933.636	2.07 E7	≥ 1.8e7	0.7316	0.6 to 0.8
Q1 1863.306	4.00 E6	≥ 8.0e5	0.6709	0.6 to 0.8

☑ Perform High Mass Q3 NEG ☑ Pass ☐ Fail

Use NEG PPG 3 x 10-5 M (10:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q3 Intensity		Q3 Width Value	Width Specs
	Value	Spec		
Q3 933.636	2.18 E7	≥ 1.8e7	0.6817	0.6 to 0.8
Q3 1863.306	8.32 E5	≥ 8.0e5	0.6400	0.6 to 0.8

☑ Perform High Mass ER POS 118.087 and 1521.972 ☑ Pass ☐ Fail

Use Agilent ESI Tuning Mix. Fill Time 0.05ms, Scan rate 1000 Da/s. Record 50 mca.

Mass	ER Intensity		ER Width Value	Width Specs
	Value	Spec		
ER 118.087	8.48 E7	≥ 8.8e6	0.2059	< 0.40
ER 1521.972	4.98 E7	≥ 4.8e7	0.4000	< 0.40

☑ Perform High Mass ER NEG 431.982 and 1633.949 ☑ Pass ☐ Fail

Use Agilent ESI Tuning Mix. Fill Time 0.05ms, Scan rate 1000 Da/s. Record 50 mca.

Mass	ER Intensity		ER Width Value	Width Specs
	Value	Spec		
ER 431.982	4.27 E8	≥ 3.2e7	0.2312	< 0.40
ER 1633.949	2.02 E7	≥ 1.6e7	0.3882	< 0.40

Low Mass Tests

Positive Mode: Masses for the peaks of interest are: 59.050, 175.133, 500.380, 616.464, 906.673. Mass calibrate to less than 0.1 amu.

Negative Mode: Masses for the peaks of interest are: 44.998, 411.259, 585.385, 933.636. Mass calibrate to less than 0.1 amu.

☑ Perform Low Mass Q1 POS ☑ Pass ☐ Fail

Use POS PPG 2 x 10-7M (500:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q1 Intensity		Q1 Width Value	Width Specs
	Value	Spec		
Q1 175.133	6.29 E6	≥ 4.8e6	0.6000	0.6 to 0.8
Q1 500.380	3.19 E7	≥ 1.8e7	0.6592	0.6 to 0.8
Q1 616.464	3.26 E7	≥ 1.1e7	0.6191	0.6 to 0.8
Q1 906.673	5.40 E7	≥ 3.6e7	0.7394	0.6 to 0.8

☑ Perform Low Mass Q3 POS ☑ Pass ☐ Fail

Use POS PPG 2 x 10-7M (500:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q3 Intensity		Q3 Width Value	Width Specs
	Value	Specs		
Q3 175.133	2.55 E7	≥ 4.8e6	0.6669	0.6 to 0.8
Q3 500.380	5.32 E7	≥ 1.8e7	0.6661	0.6 to 0.8
Q3 616.464	3.28 E7	≥ 1.1e7	0.6752	0.6 to 0.8
Q3 906.673	6.46 E7	≥ 3.6e7	0.6620	0.6 to 0.8

☑ Perform Low Mass MSMS POS in Product Ion scan

Use 907 parent and record daughter 175.1 using POS PPG 2e-7M (500:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	MSMS Intensity		MSMS Width Value	Width Specs
	Value	Spec		
MS/MS 175.1	8.68 E6	Read Only	0.6443	Read Only

☑ Perform Low Mass Q1 NEG ☑ Pass ☐ Fail

Use NEG PPG 3 x 10-5 M (10:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q1 Intensity		Q1 Width Value	Width Specs
	Value	Spec		
Q1 933.636	2.18 E7	≥ 1.8e7	0.7101	0.6 to 0.8

☑ Perform Low Mass Q3 NEG ☑ Pass ☐ Fail

Use NEG PPG 3 x 10-5 M (10:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q3 Intensity		Q3 Width Value	Width Specs
	Value	Spec		
Q3 933.636	1.82	≥ 1.8e7	0.7565	0.6 to 0.8

☑ Perform Low Mass MSMS NEG in Product Ion scan
Use 933.6 parent and record daughter 45.0 using NEG PPG 3 x 10-5 M (10:1) at the scan rate of 10 Da/s for 10 MCA.

Mass	MSMS Intensity		MSMS Width Value	Width Specs
	Value	Spec		
MS/MS 45.0	2.9 E6	Read Only	0.6631	Read Only

☑ Perform Low Mass ER POS 118.087 and 922.01 ☑ Pass ☐ Fail
Use Agilent ESI Tuning Mix. Fill Time 0.05ms, Scan rate 1000 Da/s. Record 50 mca.

Mass	ER Intensity		ER Width Value	Width Specs
	Value	Spec		
ER 118.087	1.48 E7	≥ 1.2e7	0.2046	< 0.35
ER 922.010	3.88 E8	≥ 1.8e8	0.3240	< 0.35

☑ Perform Low Mass ER NEG 431.982 and 601.978 ☐ Pass ☐ Fail
Use Agilent ES Tuning Mix. Fill Time 0.05ms, Scan rate 1000 Da/s. Record 50 mca.

Mass	ER Intensity		ER Width Value	Width Specs
	Value	Spec		
ER 431.982	9.59 E8	≥ 4.8e7	0.2237	< 0.35
ER 601.978	1.14 E8	≥ 8.0e7	0.2381	< 0.35

☑ Perform Low Mass EPI POS 397.2 ☑ Pass ☐ Fail
Use Reserpine 0.167pmol/uL. Scan rate 10,000 Da/s. Record 20 mca.

Mass	Q0 Trapping OFF		Q0 Trapping ON	
	Value	Spec	Value	Spec
EPI 397.2	8.82 E6	≥ 8.0e6	1.47 E8	≥ 6.4e7

Review:

☑ Attach all spectrums printouts to this Checklist

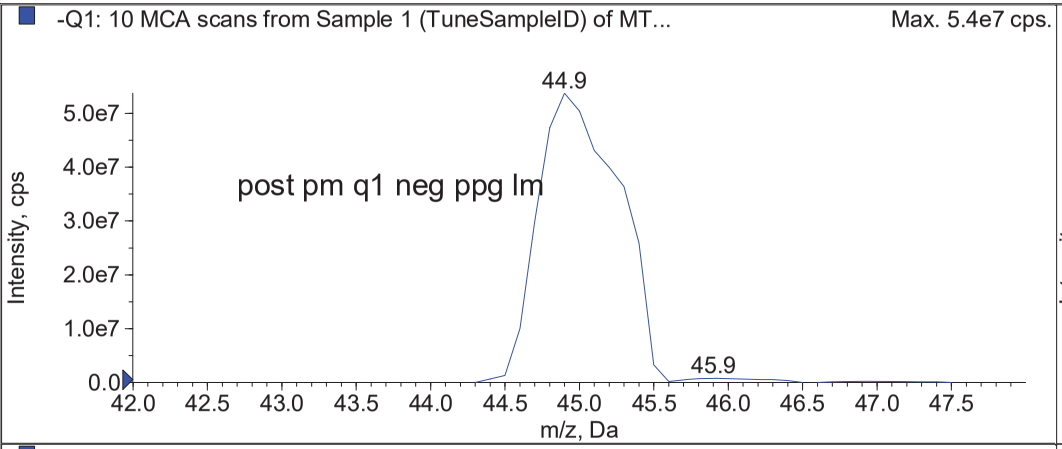
☑ If any parameter setting access modes were changed during the PM, ensure they are returned to their normal access mode and that their offsets are adjusted to match optimized values from the post-PM acquisition files

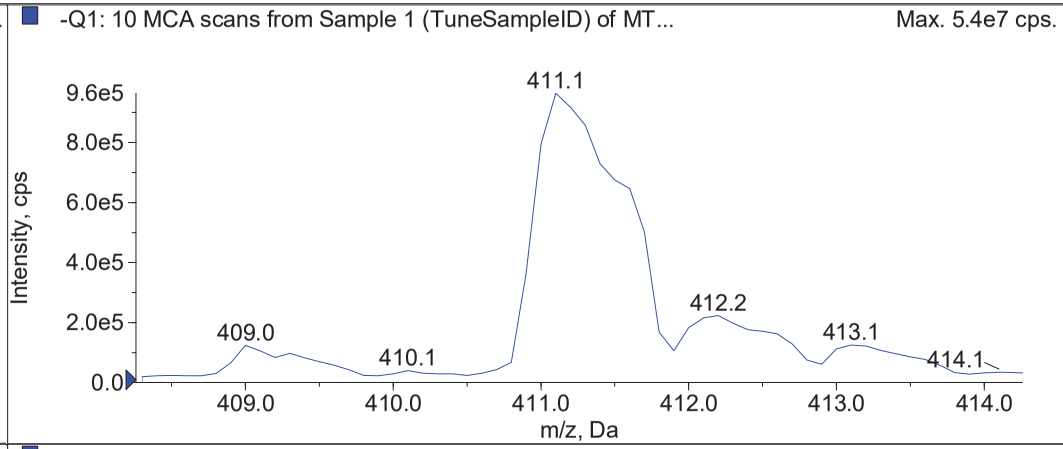
☐ Empty tuning cache folder if necessary ☑ N/A

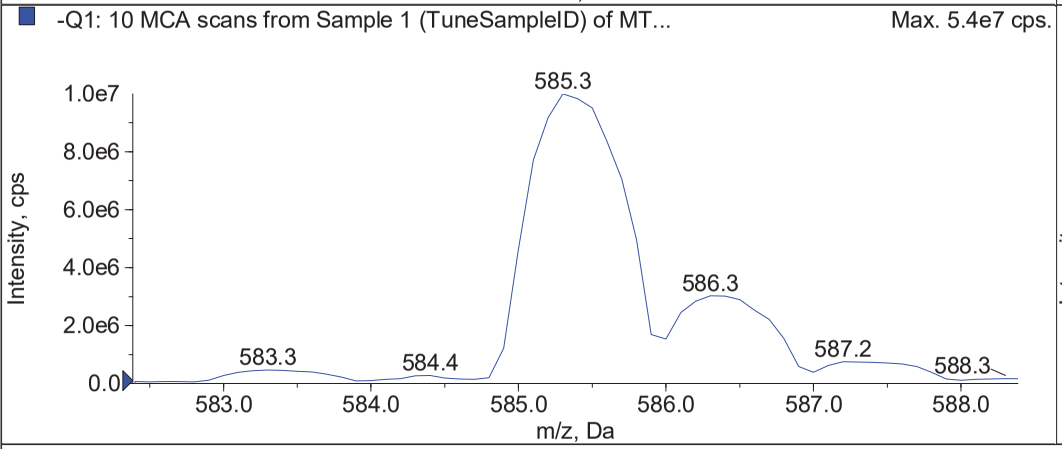
☑ Provide Service Report

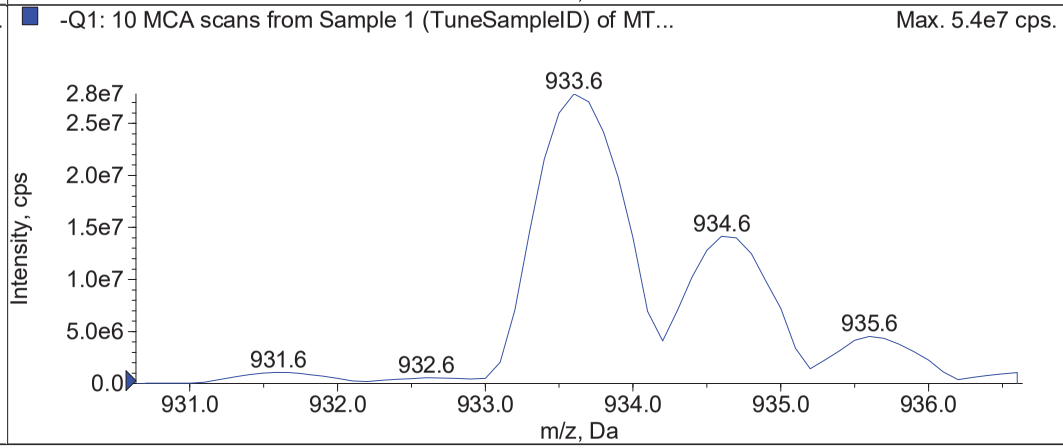
☑ Fill and replace PM Label

----END OF PREVENTIVE MAINTENANCE PROCEDURE----



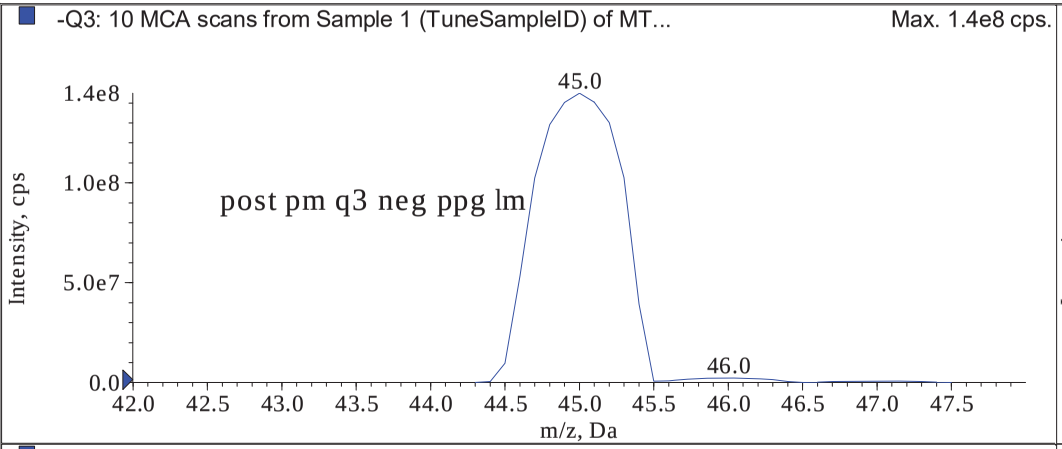


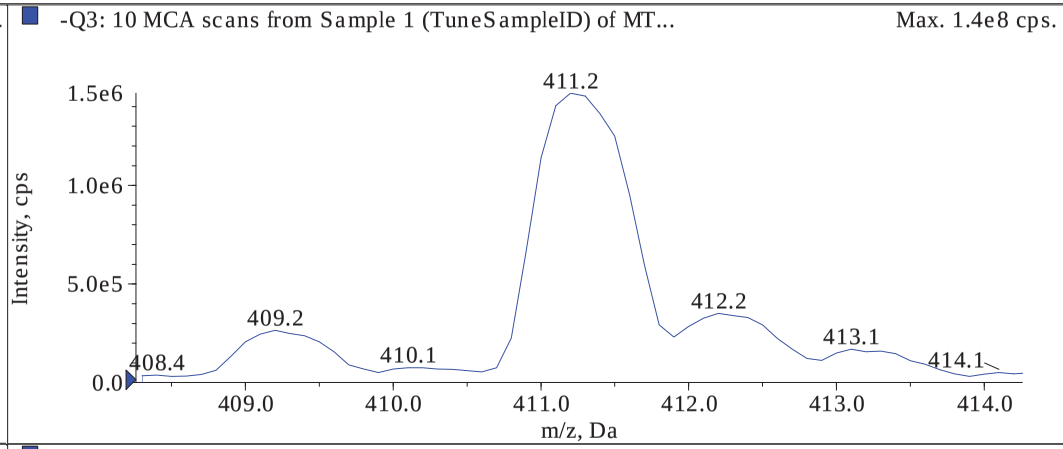


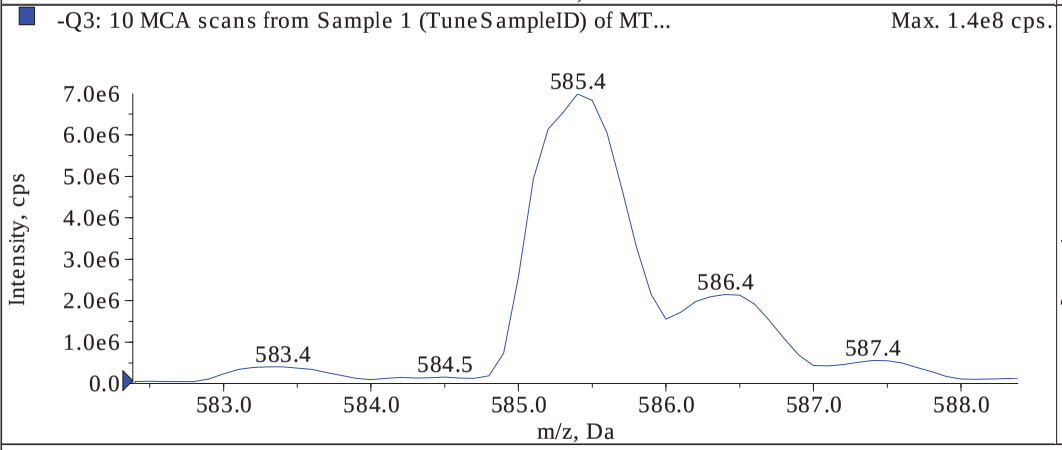


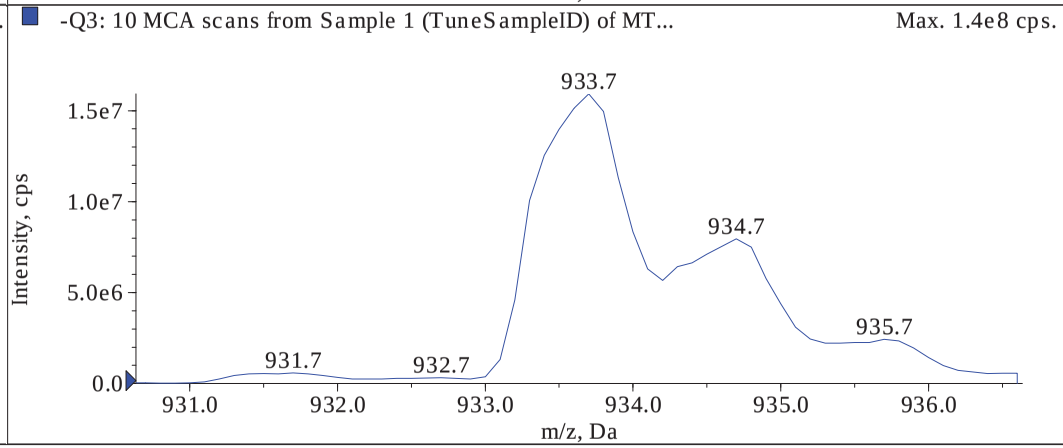
Peak List for "-Q1: 10 MCA scans from Sample 1 (TuneSampleID) of MT20230406152943.wiff (Turbo Spray IonDrive)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	44.9947	5.3715e7	0.7059	3.2569e-3
2	411.2590	411.2492	9.6440e5	0.7783	9.7825e-3
3	585.3850	585.3845	9.9981e6	0.7865	5.2386e-4
4	933.6360	933.6353	2.7843e7	0.7101	7.3030e-4
5	1223.8450	n/a	n/a	n/a	n/a
6	1572.0970	n/a	n/a	n/a	n/a
7	1863.3060	n/a	n/a	n/a	n/a
8	1979.3890	n/a	n/a	n/a	n/a



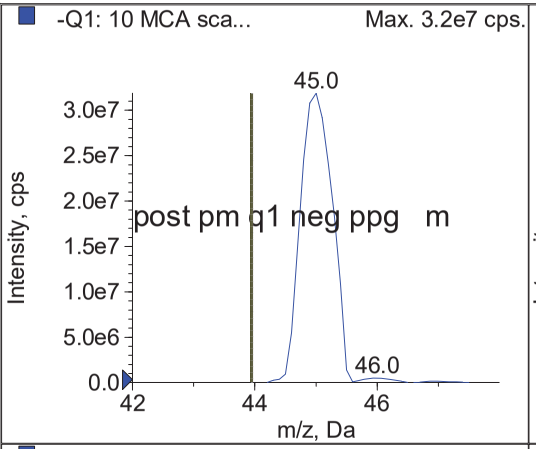


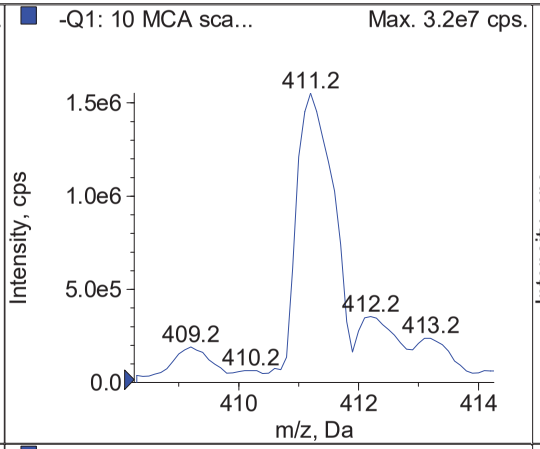


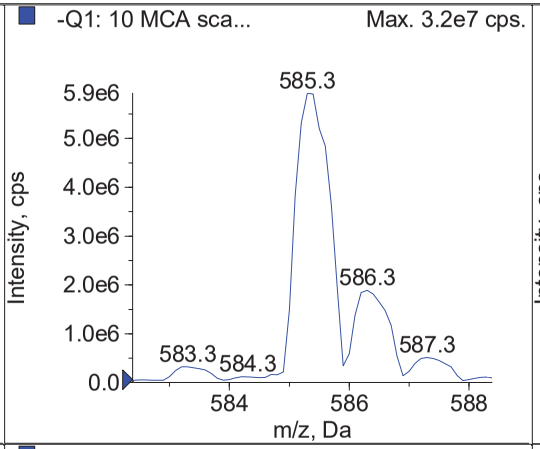


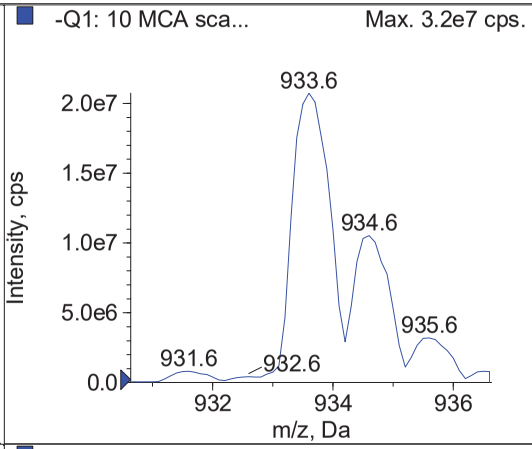
Peak List for "-Q3: 10 MCA scans from Sample 1 (TuneSampleID) of MT20230406153429.wiff (Turbo Spray IonDrive)"

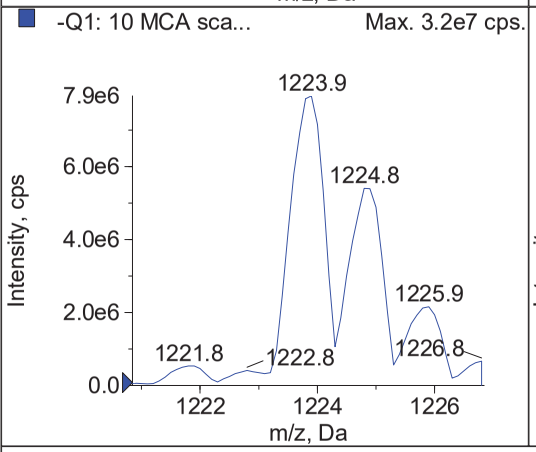
	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	45.0006	1.4487e8	0.7089	-2.6268e-3
2	411.2590	411.2749	1.4676e6	0.7464	-0.0159
3	585.3850	585.3967	6.9912e6	0.7467	-0.0117
4	933.6360	933.6315	1.5932e7	0.7569	4.5346e-3
5	1223.8450	n/a	n/a	n/a	n/a
6	1572.0970	n/a	n/a	n/a	n/a
7	1863.3060	n/a	n/a	n/a	n/a
8	1979.3890	n/a	n/a	n/a	n/a

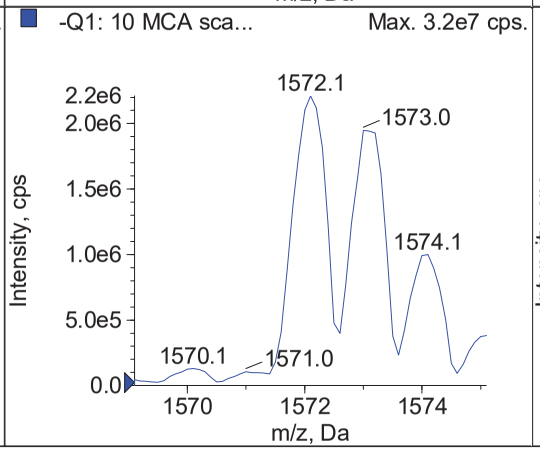


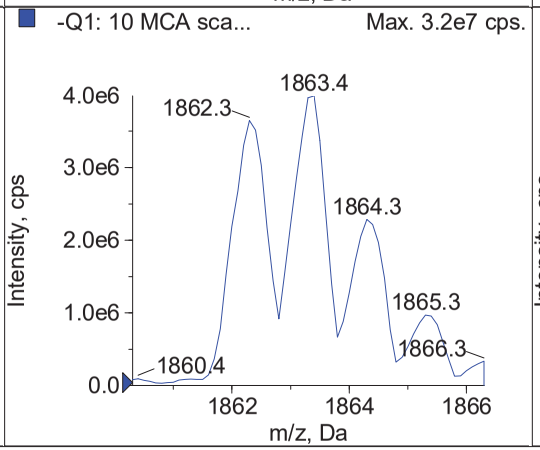


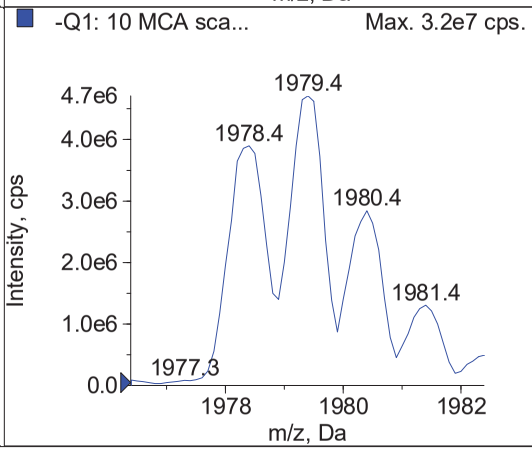






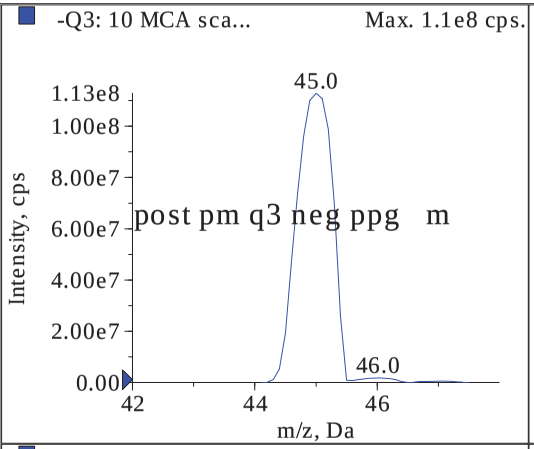


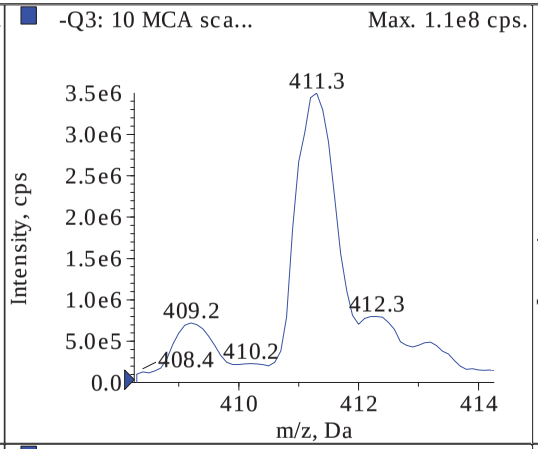


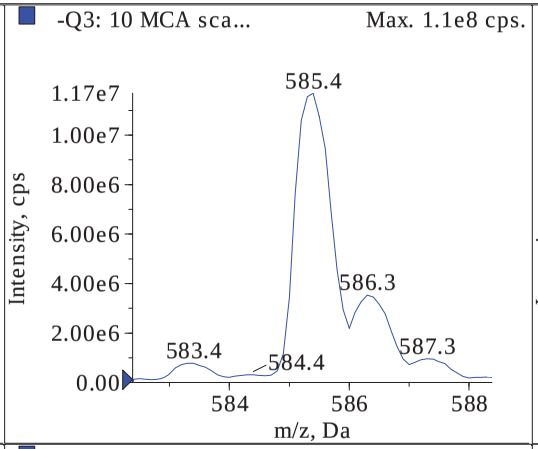


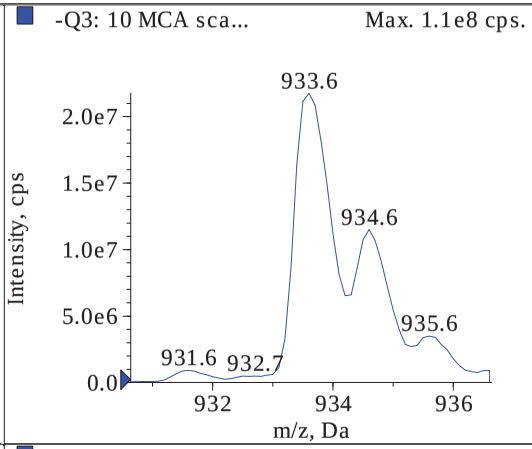
Peak List for "-Q1: 10 MCA scans from Sample 1 (TuneSampleID) of MT20230406151112.wiff (Turbo Spray IonDrive)"

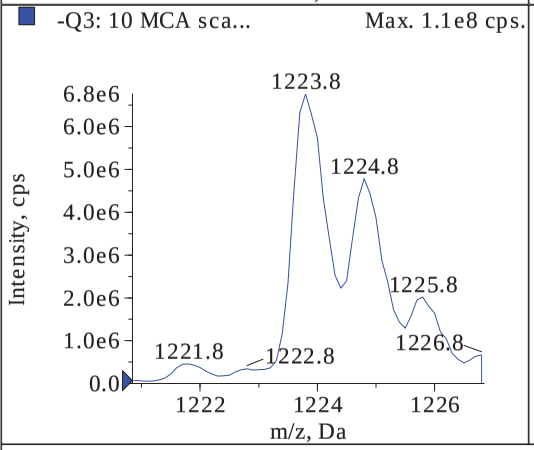
	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	45.0074	3.1880e7	0.6224	-9.4339e-3
2	411.2590	411.2647	1.5521e6	0.7609	-5.6865e-3
3	585.3850	585.3837	5.9261e6	0.6780	1.3271e-3
4	933.6360	933.6254	2.0729e7	0.7316	0.0106
5	1223.8450	1223.8414	7.9422e6	0.6711	3.6359e-3
6	1572.0970	1572.0928	2.2120e6	0.6703	4.1518e-3
7	1863.3060	1863.3252	3.9877e6	0.6742	-0.0192
8	1979.3890	1979.3807	4.7117e6	0.6614	8.2592e-3

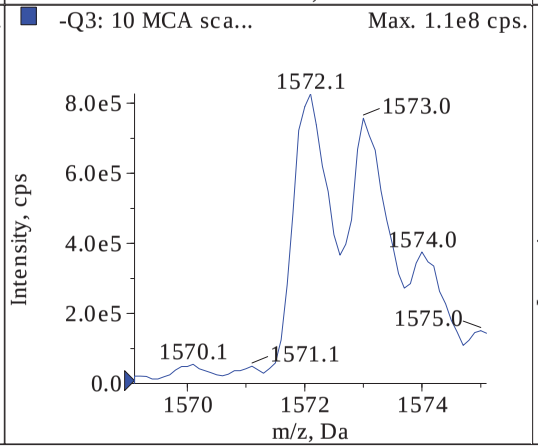


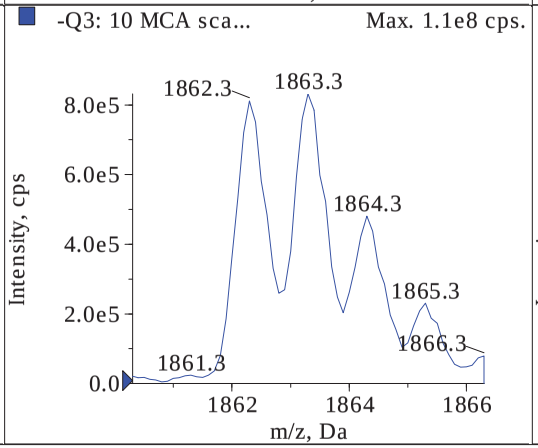


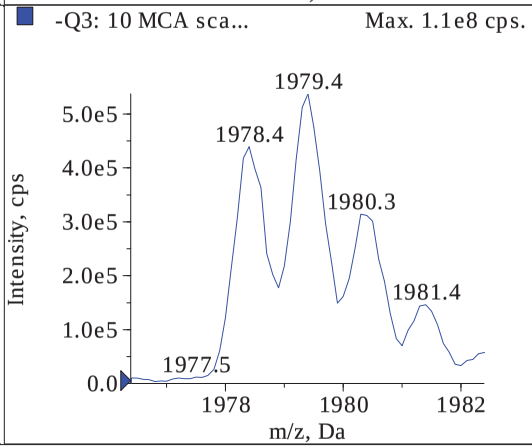












Peak List for "-Q3: 10 MCA scans from Sample 1 (TuneSampleID) of MT20230406151739.wiff (Turbo Spray IonDrive)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	44.9973	1.1287e8	0.6955	7.1089e-4
2	411.2590	411.2767	3.4977e6	0.7831	-0.0177
3	585.3850	585.3798	1.1691e7	0.6851	5.2373e-3
4	933.6360	933.6347	2.1756e7	0.6817	1.3424e-3
5	1223.8450	1223.8413	6.7654e6	0.6564	3.7219e-3
6	1572.0970	1572.0987	8.2710e5	0.7552	-1.7395e-3
7	1863.3060	1863.3222	8.3210e5	0.6400	-0.0162
8	1979.3890	1979.3909	5.3750e5	0.6767	-1.9292e-3

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-08
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-09
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-10
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-11
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-12
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-13
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-14
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-15
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-16
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-17
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-18
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-19
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-20
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-24
LZ39	PFAS DoD Surrogate (28 Targets)	-	-	-	230210-03
LZ39	PFAS DoD Surrogate (28 Targets)	-	-	-	230210-04
LZ39	PFAS DoD Surrogate (28 Targets)	-	-	-	230210-05
LZ39	PFAS DoD Surrogate (28 Targets)	-	-	-	230210-06
LZ39	PFAS DoD Surrogate (28 Targets)	-	-	-	230210-07
LZ39	PFAS DoD Surrogate (28 Targets)	-	-	-	230210-08
LX91	PFAS DoD Second Source LCS/MS (18 Analytes)	-	-	-	221103-02
LZ03	PFAS DoD Second Source LCS/MS (28 Analytes)	-	-	-	230113-01
LZ03	PFAS DoD Second Source LCS/MS (28 Analytes)	LZ02	-	-	230124-02
LZ03	PFAS DoD Second Source LCS/MS (28 Analytes)	LZ02	-	-	230124-03
LZ03	PFAS DoD Second Source LCS/MS (28 Analytes)	LZ02	-	-	230124-04
LZ07	PFAS DoD Internal Standard	-	-	-	220728-19
LZ07	PFAS DoD Internal Standard	-	-	-	230306-07
LZ07	PFAS DoD Internal Standard	-	-	-	230714-01
LZ07	PFAS DoD Internal Standard	-	-	-	230714-02
LZ83	PFAS DoD ICAL L2	LW18	-	-	220124-04
LZ83	PFAS DoD ICAL L2	LW18	-	-	230124-01
LZ83	PFAS DoD ICAL L2	LW18	-	-	230124-05
LZ83	PFAS DoD ICAL L2	LW18	-	-	230124-06
LZ83	PFAS DoD ICAL L2	LW18	-	-	230124-09
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-08
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-09
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-10
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-11
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-12
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-13
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-14
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-15
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-16
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-17
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-18
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-19
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-20
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-24
LZ83	PFAS DoD ICAL L2	LZ07	-	-	220728-19

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ83	PFAS DoD ICAL L2	LZ07	-	-	230306-07
LZ83	PFAS DoD ICAL L2	LZ07	-	-	230714-01
LZ83	PFAS DoD ICAL L2	LZ07	-	-	230714-02
LZ83	PFAS DoD ICAL L2	LZ39	-	-	230210-03
LZ83	PFAS DoD ICAL L2	LZ39	-	-	230210-04
LZ83	PFAS DoD ICAL L2	LZ39	-	-	230210-05
LZ83	PFAS DoD ICAL L2	LZ39	-	-	230210-06
LZ83	PFAS DoD ICAL L2	LZ39	-	-	230210-07
LZ83	PFAS DoD ICAL L2	LZ39	-	-	230210-08
LZ83	PFAS DoD ICAL L2	LZ81	LZ80	LZ79	230113-02
LZ84	PFAS DoD ICAL L3	LW18	-	-	220124-04
LZ84	PFAS DoD ICAL L3	LW18	-	-	230124-01
LZ84	PFAS DoD ICAL L3	LW18	-	-	230124-05
LZ84	PFAS DoD ICAL L3	LW18	-	-	230124-06
LZ84	PFAS DoD ICAL L3	LW18	-	-	230124-09
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-08
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-09
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-10
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-11
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-12
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-13
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-14
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-15
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-16
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-17
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-18
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-19
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-20
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-24
LZ84	PFAS DoD ICAL L3	LZ07	-	-	220728-19
LZ84	PFAS DoD ICAL L3	LZ07	-	-	230306-07
LZ84	PFAS DoD ICAL L3	LZ07	-	-	230714-01
LZ84	PFAS DoD ICAL L3	LZ07	-	-	230714-02
LZ84	PFAS DoD ICAL L3	LZ39	-	-	230210-03
LZ84	PFAS DoD ICAL L3	LZ39	-	-	230210-04
LZ84	PFAS DoD ICAL L3	LZ39	-	-	230210-05
LZ84	PFAS DoD ICAL L3	LZ39	-	-	230210-06
LZ84	PFAS DoD ICAL L3	LZ39	-	-	230210-07
LZ84	PFAS DoD ICAL L3	LZ39	-	-	230210-08
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	-	230113-02
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LZ02	230124-02
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LZ02	230124-03
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LZ02	230124-04
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-01
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-02
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-03
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-04
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-05
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-06

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-07
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-08
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-09
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-10
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-11
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-12
LZ85	PFAS DoD ICAL L4	LW18	-	-	220124-04
LZ85	PFAS DoD ICAL L4	LW18	-	-	230124-01
LZ85	PFAS DoD ICAL L4	LW18	-	-	230124-05
LZ85	PFAS DoD ICAL L4	LW18	-	-	230124-06
LZ85	PFAS DoD ICAL L4	LW18	-	-	230124-09
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-08
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-09
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-10
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-11
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-12
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-13
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-14
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-15
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-16
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-17
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-18
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-19
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-20
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-24
LZ85	PFAS DoD ICAL L4	LZ07	-	-	220728-19
LZ85	PFAS DoD ICAL L4	LZ07	-	-	230306-07
LZ85	PFAS DoD ICAL L4	LZ07	-	-	230714-01
LZ85	PFAS DoD ICAL L4	LZ07	-	-	230714-02
LZ85	PFAS DoD ICAL L4	LZ39	-	-	230210-03
LZ85	PFAS DoD ICAL L4	LZ39	-	-	230210-04
LZ85	PFAS DoD ICAL L4	LZ39	-	-	230210-05
LZ85	PFAS DoD ICAL L4	LZ39	-	-	230210-06
LZ85	PFAS DoD ICAL L4	LZ39	-	-	230210-07
LZ85	PFAS DoD ICAL L4	LZ39	-	-	230210-08
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	-	230113-02
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LZ02	230124-02
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LZ02	230124-03
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LZ02	230124-04
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-01
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-02
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-03
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-04
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-05
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-06
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-07
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-08
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-09
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-10

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-11
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-12
LZ86	PFAS DoD ICAL L5	LW18	-	-	220124-04
LZ86	PFAS DoD ICAL L5	LW18	-	-	230124-01
LZ86	PFAS DoD ICAL L5	LW18	-	-	230124-05
LZ86	PFAS DoD ICAL L5	LW18	-	-	230124-06
LZ86	PFAS DoD ICAL L5	LW18	-	-	230124-09
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-08
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-09
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-10
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-11
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-12
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-13
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-14
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-15
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-16
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-17
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-18
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-19
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-20
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-24
LZ86	PFAS DoD ICAL L5	LZ07	-	-	220728-19
LZ86	PFAS DoD ICAL L5	LZ07	-	-	230306-07
LZ86	PFAS DoD ICAL L5	LZ07	-	-	230714-01
LZ86	PFAS DoD ICAL L5	LZ07	-	-	230714-02
LZ86	PFAS DoD ICAL L5	LZ39	-	-	230210-03
LZ86	PFAS DoD ICAL L5	LZ39	-	-	230210-04
LZ86	PFAS DoD ICAL L5	LZ39	-	-	230210-05
LZ86	PFAS DoD ICAL L5	LZ39	-	-	230210-06
LZ86	PFAS DoD ICAL L5	LZ39	-	-	230210-07
LZ86	PFAS DoD ICAL L5	LZ39	-	-	230210-08
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	-	230113-02
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LZ02	230124-02
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LZ02	230124-03
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LZ02	230124-04
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-01
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-02
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-03
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-04
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-05
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-06
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-07
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-08
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-09
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-10
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-11
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-12
LZ87	PFAS DoD ICAL L6	LW18	-	-	220124-04
LZ87	PFAS DoD ICAL L6	LW18	-	-	230124-01

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ87	PFAS DoD ICAL L6	LW18	-	-	230124-05
LZ87	PFAS DoD ICAL L6	LW18	-	-	230124-06
LZ87	PFAS DoD ICAL L6	LW18	-	-	230124-09
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-08
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-09
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-10
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-11
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-12
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-13
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-14
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-15
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-16
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-17
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-18
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-19
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-20
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-24
LZ87	PFAS DoD ICAL L6	LZ07	-	-	220728-19
LZ87	PFAS DoD ICAL L6	LZ07	-	-	230306-07
LZ87	PFAS DoD ICAL L6	LZ07	-	-	230714-01
LZ87	PFAS DoD ICAL L6	LZ07	-	-	230714-02
LZ87	PFAS DoD ICAL L6	LZ39	-	-	230210-03
LZ87	PFAS DoD ICAL L6	LZ39	-	-	230210-04
LZ87	PFAS DoD ICAL L6	LZ39	-	-	230210-05
LZ87	PFAS DoD ICAL L6	LZ39	-	-	230210-06
LZ87	PFAS DoD ICAL L6	LZ39	-	-	230210-07
LZ87	PFAS DoD ICAL L6	LZ39	-	-	230210-08
LZ87	PFAS DoD ICAL L6	LZ79	-	-	230113-02
LZ87	PFAS DoD ICAL L6	LZ79	LZ02	-	230124-02
LZ87	PFAS DoD ICAL L6	LZ79	LZ02	-	230124-03
LZ87	PFAS DoD ICAL L6	LZ79	LZ02	-	230124-04
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-01
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-02
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-03
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-04
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-05
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-06
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-07
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-08
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-09
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-10
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-11
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-12
LZ88	PFAS DoD ICAL L7	LW18	-	-	220124-04
LZ88	PFAS DoD ICAL L7	LW18	-	-	230124-01
LZ88	PFAS DoD ICAL L7	LW18	-	-	230124-05
LZ88	PFAS DoD ICAL L7	LW18	-	-	230124-06
LZ88	PFAS DoD ICAL L7	LW18	-	-	230124-09
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-08

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-09
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-10
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-11
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-12
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-13
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-14
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-15
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-16
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-17
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-18
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-19
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-20
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-24
LZ88	PFAS DoD ICAL L7	LZ07	-	-	220728-19
LZ88	PFAS DoD ICAL L7	LZ07	-	-	230306-07
LZ88	PFAS DoD ICAL L7	LZ07	-	-	230714-01
LZ88	PFAS DoD ICAL L7	LZ07	-	-	230714-02
LZ88	PFAS DoD ICAL L7	LZ39	-	-	230210-03
LZ88	PFAS DoD ICAL L7	LZ39	-	-	230210-04
LZ88	PFAS DoD ICAL L7	LZ39	-	-	230210-05
LZ88	PFAS DoD ICAL L7	LZ39	-	-	230210-06
LZ88	PFAS DoD ICAL L7	LZ39	-	-	230210-07
LZ88	PFAS DoD ICAL L7	LZ39	-	-	230210-08
LZ88	PFAS DoD ICAL L7	LZ79	-	-	230113-02
LZ88	PFAS DoD ICAL L7	LZ79	LZ02	-	230124-02
LZ88	PFAS DoD ICAL L7	LZ79	LZ02	-	230124-03
LZ88	PFAS DoD ICAL L7	LZ79	LZ02	-	230124-04
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-01
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-02
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-03
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-04
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-05
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-06
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-07
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-08
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-09
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-10
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-11
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-12
LZ89	PFAS DoD ICAL L8	LW18	-	-	220124-04
LZ89	PFAS DoD ICAL L8	LW18	-	-	230124-01
LZ89	PFAS DoD ICAL L8	LW18	-	-	230124-05
LZ89	PFAS DoD ICAL L8	LW18	-	-	230124-06
LZ89	PFAS DoD ICAL L8	LW18	-	-	230124-09
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-08
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-09
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-10
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-11
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-12

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-13
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-14
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-15
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-16
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-17
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-18
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-19
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-20
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-24
LZ89	PFAS DoD ICAL L8	LZ07	-	-	220728-19
LZ89	PFAS DoD ICAL L8	LZ07	-	-	230306-07
LZ89	PFAS DoD ICAL L8	LZ07	-	-	230714-01
LZ89	PFAS DoD ICAL L8	LZ07	-	-	230714-02
LZ89	PFAS DoD ICAL L8	LZ39	-	-	230210-03
LZ89	PFAS DoD ICAL L8	LZ39	-	-	230210-04
LZ89	PFAS DoD ICAL L8	LZ39	-	-	230210-05
LZ89	PFAS DoD ICAL L8	LZ39	-	-	230210-06
LZ89	PFAS DoD ICAL L8	LZ39	-	-	230210-07
LZ89	PFAS DoD ICAL L8	LZ39	-	-	230210-08
LZ89	PFAS DoD ICAL L8	LZ79	-	-	230113-02
LZ89	PFAS DoD ICAL L8	LZ79	LZ02	-	230124-02
LZ89	PFAS DoD ICAL L8	LZ79	LZ02	-	230124-03
LZ89	PFAS DoD ICAL L8	LZ79	LZ02	-	230124-04
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-01
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-02
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-03
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-04
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-05
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-06
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-07
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-08
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-09
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-10
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-11
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-12
LZ90	PFAS DoD ICAL L9	LW18	-	-	220124-04
LZ90	PFAS DoD ICAL L9	LW18	-	-	230124-01
LZ90	PFAS DoD ICAL L9	LW18	-	-	230124-05
LZ90	PFAS DoD ICAL L9	LW18	-	-	230124-06
LZ90	PFAS DoD ICAL L9	LW18	-	-	230124-09
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-08
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-09
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-10
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-11
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-12
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-13
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-14
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-15
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-16

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-17
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-18
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-19
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-20
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-24
LZ90	PFAS DoD ICAL L9	LZ07	-	-	220728-19
LZ90	PFAS DoD ICAL L9	LZ07	-	-	230306-07
LZ90	PFAS DoD ICAL L9	LZ07	-	-	230714-01
LZ90	PFAS DoD ICAL L9	LZ07	-	-	230714-02
LZ90	PFAS DoD ICAL L9	LZ39	-	-	230210-03
LZ90	PFAS DoD ICAL L9	LZ39	-	-	230210-04
LZ90	PFAS DoD ICAL L9	LZ39	-	-	230210-05
LZ90	PFAS DoD ICAL L9	LZ39	-	-	230210-06
LZ90	PFAS DoD ICAL L9	LZ39	-	-	230210-07
LZ90	PFAS DoD ICAL L9	LZ39	-	-	230210-08
LZ90	PFAS DoD ICAL L9	LZ79	-	-	230113-02
LZ90	PFAS DoD ICAL L9	LZ79	LZ02	-	230124-02
LZ90	PFAS DoD ICAL L9	LZ79	LZ02	-	230124-03
LZ90	PFAS DoD ICAL L9	LZ79	LZ02	-	230124-04
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-01
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-02
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-03
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-04
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-05
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-06
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-07
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-08
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-09
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-10
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-11
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-12
LZ92	PFAS DoD ICC	LW18	-	-	220124-04
LZ92	PFAS DoD ICC	LW18	-	-	230124-01
LZ92	PFAS DoD ICC	LW18	-	-	230124-05
LZ92	PFAS DoD ICC	LW18	-	-	230124-06
LZ92	PFAS DoD ICC	LW18	-	-	230124-09
LZ92	PFAS DoD ICC	LX92	-	-	230306-08
LZ92	PFAS DoD ICC	LX92	-	-	230306-09
LZ92	PFAS DoD ICC	LX92	-	-	230306-10
LZ92	PFAS DoD ICC	LX92	-	-	230306-11
LZ92	PFAS DoD ICC	LX92	-	-	230306-12
LZ92	PFAS DoD ICC	LX92	-	-	230306-13
LZ92	PFAS DoD ICC	LX92	-	-	230306-14
LZ92	PFAS DoD ICC	LX92	-	-	230306-15
LZ92	PFAS DoD ICC	LX92	-	-	230306-16
LZ92	PFAS DoD ICC	LX92	-	-	230306-17
LZ92	PFAS DoD ICC	LX92	-	-	230306-18
LZ92	PFAS DoD ICC	LX92	-	-	230306-19
LZ92	PFAS DoD ICC	LX92	-	-	230306-20

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ92	PFAS DoD ICC	LX92	-	-	230306-24
LZ92	PFAS DoD ICC	LZ07	-	-	220728-19
LZ92	PFAS DoD ICC	LZ07	-	-	230306-07
LZ92	PFAS DoD ICC	LZ07	-	-	230714-01
LZ92	PFAS DoD ICC	LZ07	-	-	230714-02
LZ92	PFAS DoD ICC	LZ32	-	-	230113-01
LZ92	PFAS DoD ICC	LZ32	LZ02	-	230124-02
LZ92	PFAS DoD ICC	LZ32	LZ02	-	230124-03
LZ92	PFAS DoD ICC	LZ32	LZ02	-	230124-04
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-01
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-02
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-03
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-04
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-05
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-06
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-07
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-08
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-09
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-10
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-11
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-12
LZ92	PFAS DoD ICC	LZ39	-	-	230210-03
LZ92	PFAS DoD ICC	LZ39	-	-	230210-04
LZ92	PFAS DoD ICC	LZ39	-	-	230210-05
LZ92	PFAS DoD ICC	LZ39	-	-	230210-06
LZ92	PFAS DoD ICC	LZ39	-	-	230210-07
LZ92	PFAS DoD ICC	LZ39	-	-	230210-08
LZ91	PFAS DoD Instrument Blank	LW18	-	-	220124-04
LZ91	PFAS DoD Instrument Blank	LW18	-	-	230124-01
LZ91	PFAS DoD Instrument Blank	LW18	-	-	230124-05
LZ91	PFAS DoD Instrument Blank	LW18	-	-	230124-06
LZ91	PFAS DoD Instrument Blank	LW18	-	-	230124-09
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-08
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-09
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-10
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-11
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-12
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-13
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-14
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-15
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-16
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-17
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-18
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-19
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-20
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-24
LZ91	PFAS DoD Instrument Blank	LZ07	-	-	220728-19
LZ91	PFAS DoD Instrument Blank	LZ07	-	-	230306-07
LZ91	PFAS DoD Instrument Blank	LZ07	-	-	230714-01

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ91	PFAS DoD Instrument Blank	LZ07	-	-	230714-02
LZ91	PFAS DoD Instrument Blank	LZ39	-	-	230210-03
LZ91	PFAS DoD Instrument Blank	LZ39	-	-	230210-04
LZ91	PFAS DoD Instrument Blank	LZ39	-	-	230210-05
LZ91	PFAS DoD Instrument Blank	LZ39	-	-	230210-06
LZ91	PFAS DoD Instrument Blank	LZ39	-	-	230210-07
LZ91	PFAS DoD Instrument Blank	LZ39	-	-	230210-08

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LW18

Description: PFAS DoD Surrogate (43 Targets)

Stock Id: 220124-04

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230124-01

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
d3-MeFOSA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230124-05

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
d7-MeFOSE	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230124-06

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
d9-EtFOSE	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230124-09

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
d5-EtFOSA	1000	50.00	1	98.000	1	100	0.50000

Final Concentrations:

Analyte:	Conc (ug/mL):
13C2-PFHxDA	.50000
d3-MeFOSA	.50000
d5-EtFOSA	.50000
d7-MeFOSE	.50000
d9-EtFOSE	.50000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
220124-04	Pipette	B909301606
230124-01	Pipette	B909301606
230124-05	Pipette	B909301606
230124-06	Pipette	B909301606
230124-09	Pipette	B909301606

Solution Prepared By: Beal, Hayley **Date Prepared:** 3/14/2023 **Expiration Date:** 3/14/2024

Solution Volume 50 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Lizotte Jr, Robert **Date:** 3/21/2023 11:25:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LX91

Description: PFAS DoD Second Source LCS/MS (18 Analytes)

Stock Id: 221103-02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	4000	2.00	1	100.000	1	20	0.40000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	4000	2.00	1	100.000	1	20	0.40000
Adona	4000	2.00	1	100.000	1	20	0.40000
Hexafluoropropylene oxide dimer acid	4000	2.00	1	100.000	1	20	0.40000
N-ethylperfluoro-octanesulfonamidoacetic acid	4000	2.00	1	100.000	1	20	0.40000
N-methylperfluoro-1-octanesulfonamidoacetic acid	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-1-butanesulfonate	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-1-hexanesulfonate	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-1-octanesulfonate	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-n-decanoic Acid	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-n-dodecanoic acid	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-n-heptanoic Acid	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-n-hexanoic acid	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-n-octanoic Acid	4000	2.00	1	100.000	1	20	0.40000
Perfluorononanoic Acid	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-n-tetradecanoic acid	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-n-tridecanoic acid	4000	2.00	1	100.000	1	20	0.40000
Perfluoro-n-undecanoic acid	4000	2.00	1	100.000	1	20	0.40000

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.40000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.40000
Adona	.40000
Hexafluoropropylene oxide dimer acid	.40000
N-ethylperfluoro-octanesulfonamidoacetic acid	.40000
N-methylperfluoro-1-octanesulfonamidoacetic acid	.40000
Perfluoro-1-butanesulfonate	.40000
Perfluoro-1-hexanesulfonate	.40000
Perfluoro-1-octanesulfonate	.40000
Perfluoro-n-decanoic Acid	.40000
Perfluoro-n-dodecanoic acid	.40000
Perfluoro-n-heptanoic Acid	.40000
Perfluoro-n-hexanoic acid	.40000
Perfluoro-n-octanoic Acid	.40000
Perfluorononanoic Acid	.40000

Solution Prepared By: Dreiker, Zachary **Date Prepared:** 5/23/2023 **Expiration Date:** 5/23/2024

Solution Volume : 50 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 5/25/2023 11:33:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LX91**

Description: PFAS DoD Second Source LCS/MS (18 Analytes)

Perfluoro-n-tetradecanoic acid	.40000
Perfluoro-n-tridecanoic acid	.40000
Perfluoro-n-undecanoic acid	.40000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
221103-02	Pipette	B814658143

Solution Prepared By: Dreiker, Zachary **Date Prepared:** 5/23/2023 **Expiration Date:** 5/23/2024

Solution Volume : 50 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 5/25/2023 11:33:00 AM

BATTELLE

It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LX92

Description: PFAS DoD Surrogate (18 Targets)

Stock Id: 230306-08

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C3-HFPO-DA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-09

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
d3-MeFOSAA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-10

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
d5-EtFOSAA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-11

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C3-PFBS	1000	46.60	1	98.000	1	100	0.46600

Stock Id: 230306-12

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C3-PFHxS	1000	47.40	1	98.000	1	100	0.47400

Stock Id: 230306-13

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C8-PFOS	1000	47.90	1	98.000	1	100	0.47900

Stock Id: 230306-14

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-15

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFTeDA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-16

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C6-PFDA	1000	50.00	1	98.000	1	100	0.50000

Solution Prepared By: Beal, Hayley **Date Prepared:** 5/23/2023 **Expiration Date:** 5/23/2024

Solution Volume : 50 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 5/25/2023 9:01:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LX92

Description: PFAS DoD Surrogate (18 Targets)

Stock Id: 230306-17

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C7-PFUnA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C5-PFHxA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-19

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C4-PFHpA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-20

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C9-PFNA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-24

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C8-PFOA	1000	50.00	1	98.000	1	100	0.50000

Final Concentrations:

Analyte:	Conc (ug/mL):
13C2-PFDoA	.50000
13C2-PFTeDA	.50000
13C3-HFPO-DA	.50000
13C3-PFBS	.46600
13C3-PFHxS	.47400
13C4-PFHpA	.50000
13C5-PFHxA	.50000
13C6-PFDA	.50000
13C7-PFUnA	.50000
13C8-PFOA	.50000
13C8-PFOS	.47900
13C9-PFNA	.50000
d3-MeFOSAA	.50000
d5-EtFOSAA	.50000

Solution Prepared By: Beal, Hayley **Date Prepared:** 5/23/2023 **Expiration Date:** 5/23/2024

Solution Volume : 50 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 5/25/2023 9:01:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LX92**

Description: PFAS DoD Surrogate (18 Targets)

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
230306-08	Pipette	B820865811
230306-09	Pipette	B820865811
230306-10	Pipette	B820865811
230306-11	Pipette	B820865811
230306-12	Pipette	B820865811
230306-13	Pipette	B820865811
230306-14	Pipette	B820865811
230306-15	Pipette	B820865811
230306-16	Pipette	B820865811
230306-17	Pipette	B820865811
230306-18	Pipette	B820865811
230306-19	Pipette	B820865811
230306-20	Pipette	B820865811
230306-24	Pipette	B820865811

Solution Prepared By: Beal, Hayley **Date Prepared:** 5/23/2023 **Expiration Date:** 5/23/2024

Solution Volume : 50 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 5/25/2023 9:01:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LY34

Description: PFAS IRAD MS Stock

Stock Id: 230608-01

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-1-dodecanesulfonate	600	48.50	1	98.000	1	7.5	3.88000

Stock Id: 230608-02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro (2-ethoxyethane) sulfonic acid	600	44.60	1	98.000	1	7.5	3.56800

Stock Id: 230608-03

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
1H,1H,2H,2H-perfluorododecane sulfonate	600	48.30	1	98.000	1	7.5	3.86400

Stock Id: 230608-04

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
N-methylperfluoro-1-octanesulfonamide	600	50.00	1	98.000	1	7.5	4.00000

Stock Id: 230608-05

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
N-ethylperfluoro-1-octanesulfonamide	600	50.00	1	98.000	1	7.5	4.00000

Stock Id: 230608-06

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	600	50.00	1	98.000	1	7.5	4.00000

Stock Id: 230608-07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	600	50.00	1	98.000	1	7.5	4.00000

Stock Id: 230608-08

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-3-methoxypropanoic acid	600	50.00	1	98.000	1	7.5	4.00000

Stock Id: 230608-09

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
nonafluoro-3,6-dioxaheptanoic acid	600	50.00	1	98.000	1	7.5	4.00000

Solution Prepared By: Kinsman, Nathaniel **Date Prepared:** 6/8/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Lizotte Jr, Robert **Date:** 6/13/2023 8:54:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LY34

Description: PFAS IRAD MS Stock

Stock Id: 230608-10

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-4-methoxybutanoic acid	600	50.00	1	98.000	1	7.5	4.00000

Stock Id: 230608-11

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-n-hexadecanoic acid	600	50.00	1	98.000	1	7.5	4.00000

Stock Id: 230608-12

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-n-octadecanoic acid	600	50.00	1	98.000	1	7.5	4.00000

Final Concentrations:

Analyte:	Conc (ug/mL):
1H,1H,2H,2H-perfluorododecane sulfonate	3.86400
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	4.00000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	4.00000
N-ethylperfluoro-1-octanesulfonamide	4.00000
N-methylperfluoro-1-octanesulfonamide	4.00000
nonafluoro-3,6-dioxaheptanoic acid	4.00000
Perfluoro (2-ethoxyethane) sulfonic acid	3.56800
Perfluoro-1-dodecanesulfonate	3.88000
Perfluoro-3-methoxypropanoic acid	4.00000
Perfluoro-4-methoxybutanoic acid	4.00000
Perfluoro-n-hexadecanoic acid	4.00000
Perfluoro-n-octadecanoic acid	4.00000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
230608-01	Pipette	B909301606
230608-02	Pipette	B909301606
230608-03	Pipette	B909301606
230608-04	Pipette	B909301606
230608-05	Pipette	B909301606
230608-06	Pipette	B909301606
230608-07	Pipette	B909301606

Solution Prepared By: Kinsman, Nathaniel **Date Prepared:** 6/8/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Lizotte Jr, Robert **Date:** 6/13/2023 8:54:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LY34**

Description: PFAS IRAD MS Stock

230608-08	Pipette	B909301606
230608-09	Pipette	B909301606
230608-10	Pipette	B909301606
230608-11	Pipette	B909301606
230608-12	Pipette	B909301606

Solution Prepared By: Kinsman, Nathaniel **Date Prepared:** 6/8/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Lizotte Jr, Robert **Date:** 6/13/2023 8:54:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☐

Standard Laboratory ID Number: LY35

Description: PFAS IRAD ICAL Stock 1

Stock Id: 230608-01

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-1-dodecanesulfonate	400	48.50	1	98.000	1	5	3.88000

Stock Id: 230608-02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro (2-ethoxyethane) sulfonic acid	400	44.60	1	98.000	1	5	3.56800

Stock Id: 230608-03

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
1H,1H,2H,2H-perfluorododecane sulfonate	400	48.30	1	98.000	1	5	3.86400

Stock Id: 230608-04

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
N-methylperfluoro-1-octanesulfonamide	400	50.00	1	98.000	1	5	4.00000

Stock Id: 230608-05

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
N-ethylperfluoro-1-octanesulfonamide	400	50.00	1	98.000	1	5	4.00000

Stock Id: 230608-06

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	400	50.00	1	98.000	1	5	4.00000

Stock Id: 230608-07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	400	50.00	1	98.000	1	5	4.00000

Stock Id: 230608-08

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-3-methoxypropanoic acid	400	50.00	1	98.000	1	5	4.00000

Stock Id: 230608-09

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
nonafluoro-3,6-dioxaheptanoic acid	400	50.00	1	98.000	1	5	4.00000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 6/8/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: _____ **Date:** _____

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☐

Standard Laboratory ID Number: LY35

Description: PFAS IRAD ICAL Stock 1

Stock Id: 230608-10

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-4-methoxybutanoic acid	400	50.00	1	98.000	1	5	4.00000

Stock Id: 230608-11

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-n-hexadecanoic acid	400	50.00	1	98.000	1	5	4.00000

Stock Id: 230608-12

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
Perfluoro-n-octadecanoic acid	400	50.00	1	98.000	1	5	4.00000

Final Concentrations:

Analyte:	Conc (ug/mL):
1H,1H,2H,2H-perfluorododecane sulfonate	3.86400
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	4.00000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	4.00000
N-ethylperfluoro-1-octanesulfonamide	4.00000
N-methylperfluoro-1-octanesulfonamide	4.00000
nonafluoro-3,6-dioxaheptanoic acid	4.00000
Perfluoro (2-ethoxyethane) sulfonic acid	3.56800
Perfluoro-1-dodecanesulfonate	3.88000
Perfluoro-3-methoxypropanoic acid	4.00000
Perfluoro-4-methoxybutanoic acid	4.00000
Perfluoro-n-hexadecanoic acid	4.00000
Perfluoro-n-octadecanoic acid	4.00000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
230608-01	Pipette	B909301606
230608-02	Pipette	B909301606
230608-03	Pipette	B909301606
230608-04	Pipette	B909301606
230608-05	Pipette	B909301606
230608-06	Pipette	B909301606
230608-07	Pipette	B909301606

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 6/8/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: _____ **Date:** _____

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☐

Standard Laboratory ID Number: **LY35**

Description: PFAS IRAD ICAL Stock 1

230608-08	Pipette	B909301606
230608-09	Pipette	B909301606
230608-10	Pipette	B909301606
230608-11	Pipette	B909301606
230608-12	Pipette	B909301606

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 6/8/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: _____ **Date:** _____

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ02

Description: PFAS FTCA Stock

Stock Id: 230124-02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
3-perfluoropropyl propanoic Acid	1000	50.00	1	98.000	1	10	5.00000

Stock Id: 230124-03

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
3-Perfluoropentyl propanoic acid	1000	50.00	1	98.000	1	10	5.00000

Stock Id: 230124-04

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
3-Perfluoroheptyl propanoic acid	1000	50.00	1	98.000	1	10	5.00000

Final Concentrations:

Analyte:	Conc (ug/mL):
3-Perfluoroheptyl propanoic acid	5.00000
3-Perfluoropentyl propanoic acid	5.00000
3-perfluoropropyl propanoic Acid	5.00000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
230124-02	Pipette	B909301606
230124-03	Pipette	B909301606
230124-04	Pipette	B909301606

Solution Prepared By: Beal, Hayley **Date Prepared:** 7/13/2023 **Expiration Date:** 7/13/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Lizotte Jr, Robert **Date:** 7/25/2023 3:21:00 PM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ03

Description: PFAS DoD Second Source LCS/MS (28 Analytes)

Stock Id: 230113-01

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	5000	1.00	1	100.000	1	12.5	0.40000
1H,1H,2H,2H-Perfluorodecane sulfonate	5000	1.01	1	100.000	1	12.5	0.40400
1H,1H,2H,2H-Perfluorohexane sulfonate	5000	1.00	1	100.000	1	12.5	0.40000
1H,1H,2H,2H-Perfluorooctane sulfonate	5000	1.00	1	100.000	1	12.5	0.40000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	5000	1.00	1	100.000	1	12.5	0.40000
Adona	5000	1.00	1	100.000	1	12.5	0.40000
Hexafluoropropylene oxide dimer acid	5000	1.00	1	100.000	1	12.5	0.40000
N-ethylperfluoro-octanesulfonamidoacetic acid	5000	1.00	1	100.000	1	12.5	0.40000
N-methylperfluoro-1-octanesulfonamidoacetic acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-1-butanesulfonate	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-1-decanesulfonate	5000	1.01	1	100.000	1	12.5	0.40400
Perfluoro-1-heptanesulfonate	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-1-hexanesulfonate	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-1-nonanesulfonate	5000	1.01	1	100.000	1	12.5	0.40400
Perfluoro-1-octanesulfonamide	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-1-octanesulfonate	5000	1.00	1	100.000	1	12.5	0.40000
perfluoro-1-pentanesulfonate	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-butanoic Acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-decanoic Acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-dodecanoic acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-heptanoic Acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-hexanoic acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-octanoic Acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluorononanoic Acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-pentanoic acid	5000	1.01	1	100.000	1	12.5	0.40400
Perfluoro-n-tetradecanoic acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-tridecanoic acid	5000	1.00	1	100.000	1	12.5	0.40000
Perfluoro-n-undecanoic acid	5000	1.00	1	100.000	1	12.5	0.40000

Stock Id: LZ02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
3-Perfluoroheptyl propanoic acid	1000	5.00	---	---	1	12.5	0.40000
3-Perfluoropentyl propanoic acid	1000	5.00	---	---	1	12.5	0.40000
3-perfluoropropyl propanoic Acid	1000	5.00	---	---	1	12.5	0.40000

Final Concentrations:

Solution Prepared By: Beal, Hayley **Date Prepared:** 7/13/2023 **Expiration Date:** 7/13/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 7/17/2023 11:03:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ03

Description: PFAS DoD Second Source LCS/MS (28 Analytes)

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.40000
1H,1H,2H,2H-Perfluorodecane sulfonate	.40400
1H,1H,2H,2H-Perfluorohexane sulfonate	.40000
1H,1H,2H,2H-Perfluorooctane sulfonate	.40000
3-Perfluoroheptyl propanoic acid	.40000
3-Perfluoropentyl propanoic acid	.40000
3-perfluoropropyl propanoic Acid	.40000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.40000
Adona	.40000
Hexafluoropropylene oxide dimer acid	.40000
N-ethylperfluoro-octanesulfonamidoacetic acid	.40000
N-methylperfluoro-1-octanesulfonamidoacetic acid	.40000
Perfluoro-1-butanesulfonate	.40000
Perfluoro-1-decanesulfonate	.40400
Perfluoro-1-heptanesulfonate	.40000
Perfluoro-1-hexanesulfonate	.40000
Perfluoro-1-nonanesulfonate	.40400
Perfluoro-1-octanesulfonamide	.40000
Perfluoro-1-octanesulfonate	.40000
perfluoro-1-pentanesulfonate	.40000
Perfluoro-n-butanoic Acid	.40000
Perfluoro-n-decanoic Acid	.40000
Perfluoro-n-dodecanoic acid	.40000
Perfluoro-n-heptanoic Acid	.40000
Perfluoro-n-hexanoic acid	.40000
Perfluoro-n-octanoic Acid	.40000
Perfluorononanoic Acid	.40000
Perfluoro-n-pentanoic acid	.40400
Perfluoro-n-tetradecanoic acid	.40000
Perfluoro-n-tridecanoic acid	.40000
Perfluoro-n-undecanoic acid	.40000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
230113-01	Pipette	B635939323
LZ02	Pipette	B909301606

Solution Prepared By: Beal, Hayley **Date Prepared:** 7/13/2023 **Expiration Date:** 7/13/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 7/17/2023 11:03:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ07

Description: PFAS DoD Internal Standard

Stock Id: 220728-19

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230306-07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C4-PFOS	1000	47.90	1	98.000	1	100	0.47900

Stock Id: 230714-01

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C3-PFBA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230714-02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFOA	1000	50.00	1	98.000	1	100	0.50000

Final Concentrations:

Analyte:	Conc (ug/mL):
13C2-PFDA	.50000
13C2-PFOA	.50000
13C3-PFBA	.50000
13C4-PFOS	.47900

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
220728-19	Pipette	B909301606
230306-07	Pipette	B909301606
230714-01	Pipette	B909301606
230714-02	Pipette	B909301606

Solution Prepared By: Beal, Hayley **Date Prepared:** 7/17/2023 **Expiration Date:** 7/17/2024

Solution Volume : 50 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 7/20/2023 8:52:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ32

Description: PFAS DoD Second Source LCS/MS (43 Analytes)

Stock Id: 230113-01

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	2000	1.00	1	100.000	1	10	0.20000
1H,1H,2H,2H-Perfluorodecane sulfonate	2000	1.01	1	100.000	1	10	0.20200
1H,1H,2H,2H-Perfluorohexane sulfonate	2000	1.00	1	100.000	1	10	0.20000
1H,1H,2H,2H-Perfluorooctane sulfonate	2000	1.00	1	100.000	1	10	0.20000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	2000	1.00	1	100.000	1	10	0.20000
Adona	2000	1.00	1	100.000	1	10	0.20000
Hexafluoropropylene oxide dimer acid	2000	1.00	1	100.000	1	10	0.20000
N-ethylperfluoro-octanesulfonamidoacetic acid	2000	1.00	1	100.000	1	10	0.20000
N-methylperfluoro-1-octanesulfonamidoacetic acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-1-butanesulfonate	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-1-decanesulfonate	2000	1.01	1	100.000	1	10	0.20200
Perfluoro-1-heptanesulfonate	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-1-hexanesulfonate	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-1-nonanesulfonate	2000	1.01	1	100.000	1	10	0.20200
Perfluoro-1-octanesulfonamide	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-1-octanesulfonate	2000	1.00	1	100.000	1	10	0.20000
perfluoro-1-pentanesulfonate	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-butanoic Acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-decanoic Acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-dodecanoic acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-heptanoic Acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-hexanoic acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-octanoic Acid	2000	1.00	1	100.000	1	10	0.20000
Perfluorononanoic Acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-pentanoic acid	2000	1.01	1	100.000	1	10	0.20200
Perfluoro-n-tetradecanoic acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-tridecanoic acid	2000	1.00	1	100.000	1	10	0.20000
Perfluoro-n-undecanoic acid	2000	1.00	1	100.000	1	10	0.20000

Stock Id: LY34

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
1H,1H,2H,2H-perfluorododecane sulfonate	500	3.86	---	---	1	10	0.19320
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	500	4.00	---	---	1	10	0.20000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	500	4.00	---	---	1	10	0.20000
N-ethylperfluoro-1-octanesulfonamide	500	4.00	---	---	1	10	0.20000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 7/27/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/1/2023 9:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ32

Description: PFAS DoD Second Source LCS/MS (43 Analytes)

N-methylperfluoro-1-octanesulfonamide	500	4.00	---	---	1	10	0.20000
nonafluoro-3,6-dioxaheptanoic acid	500	4.00	---	---	1	10	0.20000
Perfluoro (2-ethoxyethane) sulfonic acid	500	3.57	---	---	1	10	0.17840
Perfluoro-1-dodecanesulfonate	500	3.88	---	---	1	10	0.19400
Perfluoro-3-methoxypropanoic acid	500	4.00	---	---	1	10	0.20000
Perfluoro-4-methoxybutanoic acid	500	4.00	---	---	1	10	0.20000
Perfluoro-n-hexadecanoic acid	500	4.00	---	---	1	10	0.20000
Perfluoro-n-octadecanoic acid	500	4.00	---	---	1	10	0.20000

Stock Id: LZ02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
3-Perfluoroheptyl propanoic acid	400	5.00	---	---	1	10	0.20000
3-Perfluoropentyl propanoic acid	400	5.00	---	---	1	10	0.20000
3-perfluoropropyl propanoic Acid	400	5.00	---	---	1	10	0.20000

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.20000
1H,1H,2H,2H-Perfluorodecane sulfonate	.20200
1H,1H,2H,2H-perfluorododecane sulfonate	.19320
1H,1H,2H,2H-Perfluorohexane sulfonate	.20000
1H,1H,2H,2H-Perfluorooctane sulfonate	.20000
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.20000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.20000
3-Perfluoroheptyl propanoic acid	.20000
3-Perfluoropentyl propanoic acid	.20000
3-perfluoropropyl propanoic Acid	.20000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.20000
Adona	.20000
Hexafluoropropylene oxide dimer acid	.20000
N-ethylperfluoro-1-octanesulfonamide	.20000
N-ethylperfluoro-octanesulfonamidoacetic acid	.20000
N-methylperfluoro-1-octanesulfonamide	.20000
N-methylperfluoro-1-octanesulfonamidoacetic acid	.20000
nonafluoro-3,6-dioxaheptanoic acid	.20000
Perfluoro (2-ethoxyethane) sulfonic acid	.17840
Perfluoro-1-butanesulfonate	.20000
Perfluoro-1-decanesulfonate	.20200
Perfluoro-1-dodecanesulfonate	.19400

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 7/27/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/1/2023 9:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ32

Description: PFAS DoD Second Source LCS/MS (43 Analytes)

Perfluoro-1-heptanesulfonate	.20000
Perfluoro-1-hexanesulfonate	.20000
Perfluoro-1-nonanesulfonate	.20200
Perfluoro-1-octanesulfonamide	.20000
Perfluoro-1-octanesulfonate	.20000
perfluoro-1-pentanesulfonate	.20000
Perfluoro-3-methoxypropanoic acid	.20000
Perfluoro-4-methoxybutanoic acid	.20000
Perfluoro-n-butanoic Acid	.20000
Perfluoro-n-decanoic Acid	.20000
Perfluoro-n-dodecanoic acid	.20000
Perfluoro-n-heptanoic Acid	.20000
Perfluoro-n-hexadecanoic acid	.20000
Perfluoro-n-hexanoic acid	.20000
Perfluoro-n-octadecanoic acid	.20000
Perfluoro-n-octanoic Acid	.20000
Perfluorononanoic Acid	.20000
Perfluoro-n-pentanoic acid	.20200
Perfluoro-n-tetradecanoic acid	.20000
Perfluoro-n-tridecanoic acid	.20000
Perfluoro-n-undecanoic acid	.20000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
230113-01	Pipette	B909301606
LY34	Pipette	B909301606
LZ02	Pipette	B909301606

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 7/27/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/1/2023 9:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ39

Description: PFAS DoD Surrogate (28 Targets)

Stock Id: 230210-03

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C4-PFBA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230210-04

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C5-PFPeA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230210-05

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C8-FOSA	1000	50.00	1	98.000	1	100	0.50000

Stock Id: 230210-06

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-6:2FTS	1000	47.60	1	98.000	1	100	0.47600

Stock Id: 230210-07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-8:2FTS	1000	48.00	1	98.000	1	100	0.48000

Stock Id: 230210-08

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	1000	46.90	1	98.000	1	100	0.46900

Final Concentrations:

Analyte:	Conc (ug/mL):
13C2-4:2FTS	.46900
13C2-6:2FTS	.47600
13C2-8:2FTS	.48000
13C4-PFBA	.50000
13C5-PFPeA	.50000
13C8-FOSA	.50000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
230210-03	Pipette	B909301606

Solution Prepared By: Beal, Hayley **Date Prepared:** 8/1/2023 **Expiration Date:** 8/1/2024

Solution Volume : 15 **mL X** 10 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/15/2023 9:57:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ39**

Description: PFAS DoD Surrogate (28 Targets)

230210-04	Pipette	B909301606
230210-05	Pipette	B909301606
230210-06	Pipette	B909301606
230210-07	Pipette	B909301606
230210-08	Pipette	B909301606

Solution Prepared By: Beal, Hayley **Date Prepared:** 8/1/2023 **Expiration Date:** 8/1/2024

Solution Volume : 15 **mL X** 10 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/15/2023 9:57:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ79

Description: PFAS DoD ICAL High Stock

Stock Id: 230113-02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	2000	1.00	1	100.000	1	4	0.50000
1H,1H,2H,2H-Perfluorodecane sulfonate	2000	1.01	1	100.000	1	4	0.50500
1H,1H,2H,2H-Perfluorohexane sulfonate	2000	1.00	1	100.000	1	4	0.50000
1H,1H,2H,2H-Perfluorooctane sulfonate	2000	1.00	1	100.000	1	4	0.50000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	2000	1.00	1	100.000	1	4	0.50000
Adona	2000	1.00	1	100.000	1	4	0.50000
Hexafluoropropylene oxide dimer acid	2000	1.00	1	100.000	1	4	0.50000
N-ethylperfluoro-octanesulfonamidoacetic acid	2000	1.00	1	100.000	1	4	0.50000
N-methylperfluoro-1-octanesulfonamidoacetic acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-1-butanesulfonate	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-1-decanesulfonate	2000	1.01	1	100.000	1	4	0.50500
Perfluoro-1-heptanesulfonate	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-1-hexanesulfonate	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-1-nonanesulfonate	2000	1.01	1	100.000	1	4	0.50500
Perfluoro-1-octanesulfonamide	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-1-octanesulfonate	2000	1.00	1	100.000	1	4	0.50000
perfluoro-1-pentanesulfonate	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-butanoic Acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-decanoic Acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-dodecanoic acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-heptanoic Acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-hexanoic acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-octanoic Acid	2000	1.00	1	100.000	1	4	0.50000
Perfluorononanoic Acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-pentanoic acid	2000	1.01	1	100.000	1	4	0.50500
Perfluoro-n-tetradecanoic acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-tridecanoic acid	2000	1.00	1	100.000	1	4	0.50000
Perfluoro-n-undecanoic acid	2000	1.00	1	100.000	1	4	0.50000

Stock Id: LY35

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
1H,1H,2H,2H-perfluorododecane sulfonate	500	3.86	---	---	1	4	0.48300
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	500	4.00	---	---	1	4	0.50000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	500	4.00	---	---	1	4	0.50000
N-ethylperfluoro-1-octanesulfonamide	500	4.00	---	---	1	4	0.50000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ79

Description: PFAS DoD ICAL High Stock

N-methylperfluoro-1-octanesulfonamide	500	4.00	---	---	1	4	0.50000
nonafluoro-3,6-dioxaheptanoic acid	500	4.00	---	---	1	4	0.50000
Perfluoro (2-ethoxyethane) sulfonic acid	500	3.57	---	---	1	4	0.44600
Perfluoro-1-dodecanesulfonate	500	3.88	---	---	1	4	0.48500
Perfluoro-3-methoxypropanoic acid	500	4.00	---	---	1	4	0.50000
Perfluoro-4-methoxybutanoic acid	500	4.00	---	---	1	4	0.50000
Perfluoro-n-hexadecanoic acid	500	4.00	---	---	1	4	0.50000
Perfluoro-n-octadecanoic acid	500	4.00	---	---	1	4	0.50000

Stock Id: LZ02

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
3-Perfluoroheptyl propanoic acid	400	5.00	---	---	1	4	0.50000
3-Perfluoropentyl propanoic acid	400	5.00	---	---	1	4	0.50000
3-perfluoropropyl propanoic Acid	400	5.00	---	---	1	4	0.50000

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.50000
1H,1H,2H,2H-Perfluorodecane sulfonate	.50500
1H,1H,2H,2H-perfluorododecane sulfonate	.48300
1H,1H,2H,2H-Perfluorohexane sulfonate	.50000
1H,1H,2H,2H-Perfluorooctane sulfonate	.50000
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.50000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.50000
3-Perfluoroheptyl propanoic acid	.50000
3-Perfluoropentyl propanoic acid	.50000
3-perfluoropropyl propanoic Acid	.50000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.50000
Adona	.50000
Hexafluoropropylene oxide dimer acid	.50000
N-ethylperfluoro-1-octanesulfonamide	.50000
N-ethylperfluoro-octanesulfonamidoacetic acid	.50000
N-methylperfluoro-1-octanesulfonamide	.50000
N-methylperfluoro-1-octanesulfonamidoacetic acid	.50000
nonafluoro-3,6-dioxaheptanoic acid	.50000
Perfluoro (2-ethoxyethane) sulfonic acid	.44600
Perfluoro-1-butanesulfonate	.50000
Perfluoro-1-decanesulfonate	.50500
Perfluoro-1-dodecanesulfonate	.48500

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ79**

Description: PFAS DoD ICAL High Stock

Perfluoro-1-heptanesulfonate	.50000
Perfluoro-1-hexanesulfonate	.50000
Perfluoro-1-nonanesulfonate	.50500
Perfluoro-1-octanesulfonamide	.50000
Perfluoro-1-octanesulfonate	.50000
perfluoro-1-pentanesulfonate	.50000
Perfluoro-3-methoxypropanoic acid	.50000
Perfluoro-4-methoxybutanoic acid	.50000
Perfluoro-n-butanoic Acid	.50000
Perfluoro-n-decanoic Acid	.50000
Perfluoro-n-dodecanoic acid	.50000
Perfluoro-n-heptanoic Acid	.50000
Perfluoro-n-hexadecanoic acid	.50000
Perfluoro-n-hexanoic acid	.50000
Perfluoro-n-octadecanoic acid	.50000
Perfluoro-n-octanoic Acid	.50000
Perfluorononanoic Acid	.50000
Perfluoro-n-pentanoic acid	.50500
Perfluoro-n-tetradecanoic acid	.50000
Perfluoro-n-tridecanoic acid	.50000
Perfluoro-n-undecanoic acid	.50000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
230113-02	Pipette	B820865811
LY35	Pipette	B820865811
LZ02	Pipette	B820865811

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ80

Description: PFAS DoD ICAL Low Stock 1

Stock Id: LZ79

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	1000	0.50	---	---	1	10	0.05000
1H,1H,2H,2H-Perfluorodecane sulfonate	1000	0.51	---	---	1	10	0.05050
1H,1H,2H,2H-perfluorododecane sulfonate	1000	0.48	---	---	1	10	0.04830
1H,1H,2H,2H-Perfluorohexane sulfonate	1000	0.50	---	---	1	10	0.05000
1H,1H,2H,2H-Perfluorooctane sulfonate	1000	0.50	---	---	1	10	0.05000
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	1000	0.50	---	---	1	10	0.05000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	1000	0.50	---	---	1	10	0.05000
3-Perfluoroheptyl propanoic acid	1000	0.50	---	---	1	10	0.05000
3-Perfluoropentyl propanoic acid	1000	0.50	---	---	1	10	0.05000
3-perfluoropropyl propanoic Acid	1000	0.50	---	---	1	10	0.05000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	1000	0.50	---	---	1	10	0.05000
Adona	1000	0.50	---	---	1	10	0.05000
Hexafluoropropylene oxide dimer acid	1000	0.50	---	---	1	10	0.05000
N-ethylperfluoro-1-octanesulfonamide	1000	0.50	---	---	1	10	0.05000
N-ethylperfluoro-octanesulfonamidoacetic acid	1000	0.50	---	---	1	10	0.05000
N-methylperfluoro-1-octanesulfonamide	1000	0.50	---	---	1	10	0.05000
N-methylperfluoro-1-octanesulfonamidoacetic acid	1000	0.50	---	---	1	10	0.05000
nonafluoro-3,6-dioxaheptanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro (2-ethoxyethane) sulfonic acid	1000	0.45	---	---	1	10	0.04460
Perfluoro-1-butanesulfonate	1000	0.50	---	---	1	10	0.05000
Perfluoro-1-decanesulfonate	1000	0.51	---	---	1	10	0.05050
Perfluoro-1-dodecanesulfonate	1000	0.49	---	---	1	10	0.04850
Perfluoro-1-heptanesulfonate	1000	0.50	---	---	1	10	0.05000
Perfluoro-1-hexanesulfonate	1000	0.50	---	---	1	10	0.05000
Perfluoro-1-nonanesulfonate	1000	0.51	---	---	1	10	0.05050
Perfluoro-1-octanesulfonamide	1000	0.50	---	---	1	10	0.05000
Perfluoro-1-octanesulfonate	1000	0.50	---	---	1	10	0.05000
perfluoro-1-pentanesulfonate	1000	0.50	---	---	1	10	0.05000
Perfluoro-3-methoxypropanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-4-methoxybutanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-butanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-decanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-dodecanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-heptanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-hexadecanoic acid	1000	0.50	---	---	1	10	0.05000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ80

Description: PFAS DoD ICAL Low Stock 1

Perfluoro-n-hexanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-octadecanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-octanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluorononanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-pentanoic acid	1000	0.51	---	---	1	10	0.05050
Perfluoro-n-tetradecanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-tridecanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-undecanoic acid	1000	0.50	---	---	1	10	0.05000

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.05000
1H,1H,2H,2H-Perfluorodecane sulfonate	.05050
1H,1H,2H,2H-perfluorododecane sulfonate	.04830
1H,1H,2H,2H-Perfluorohexane sulfonate	.05000
1H,1H,2H,2H-Perfluorooctane sulfonate	.05000
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.05000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.05000
3-Perfluoroheptyl propanoic acid	.05000
3-Perfluoropentyl propanoic acid	.05000
3-perfluoropropyl propanoic Acid	.05000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.05000
Adona	.05000
Hexafluoropropylene oxide dimer acid	.05000
N-ethylperfluoro-1-octanesulfonamide	.05000
N-ethylperfluoro-octanesulfonamidoacetic acid	.05000
N-methylperfluoro-1-octanesulfonamide	.05000
N-methylperfluoro-1-octanesulfonamidoacetic acid	.05000
nonafluoro-3,6-dioxaheptanoic acid	.05000
Perfluoro (2-ethoxyethane) sulfonic acid	.04460
Perfluoro-1-butanesulfonate	.05000
Perfluoro-1-decanesulfonate	.05050
Perfluoro-1-dodecanesulfonate	.04850
Perfluoro-1-heptanesulfonate	.05000
Perfluoro-1-hexanesulfonate	.05000
Perfluoro-1-nonanesulfonate	.05050
Perfluoro-1-octanesulfonamide	.05000
Perfluoro-1-octanesulfonate	.05000
perfluoro-1-pentanesulfonate	.05000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ80**

Description: PFAS DoD ICAL Low Stock 1

Perfluoro-3-methoxypropanoic acid	.05000
Perfluoro-4-methoxybutanoic acid	.05000
Perfluoro-n-butanoic Acid	.05000
Perfluoro-n-decanoic Acid	.05000
Perfluoro-n-dodecanoic acid	.05000
Perfluoro-n-heptanoic Acid	.05000
Perfluoro-n-hexadecanoic acid	.05000
Perfluoro-n-hexanoic acid	.05000
Perfluoro-n-octadecanoic acid	.05000
Perfluoro-n-octanoic Acid	.05000
Perfluorononanoic Acid	.05000
Perfluoro-n-pentanoic acid	.05050
Perfluoro-n-tetradecanoic acid	.05000
Perfluoro-n-tridecanoic acid	.05000
Perfluoro-n-undecanoic acid	.05000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LZ79	Pipette	B820865811

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ81

Description: PFAS DoD ICAL Low Stock 2

Stock Id: LZ80

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	2000	0.05	---	---	1	4	0.02500
1H,1H,2H,2H-Perfluorodecane sulfonate	2000	0.05	---	---	1	4	0.02525
1H,1H,2H,2H-perfluorododecane sulfonate	2000	0.05	---	---	1	4	0.02415
1H,1H,2H,2H-Perfluorohexane sulfonate	2000	0.05	---	---	1	4	0.02500
1H,1H,2H,2H-Perfluorooctane sulfonate	2000	0.05	---	---	1	4	0.02500
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	2000	0.05	---	---	1	4	0.02500
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	2000	0.05	---	---	1	4	0.02500
3-Perfluoroheptyl propanoic acid	2000	0.05	---	---	1	4	0.02500
3-Perfluoropentyl propanoic acid	2000	0.05	---	---	1	4	0.02500
3-perfluoropropyl propanoic Acid	2000	0.05	---	---	1	4	0.02500
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	2000	0.05	---	---	1	4	0.02500
Adona	2000	0.05	---	---	1	4	0.02500
Hexafluoropropylene oxide dimer acid	2000	0.05	---	---	1	4	0.02500
N-ethylperfluoro-1-octanesulfonamide	2000	0.05	---	---	1	4	0.02500
N-ethylperfluoro-octanesulfonamidoacetic acid	2000	0.05	---	---	1	4	0.02500
N-methylperfluoro-1-octanesulfonamide	2000	0.05	---	---	1	4	0.02500
N-methylperfluoro-1-octanesulfonamidoacetic acid	2000	0.05	---	---	1	4	0.02500
nonafluoro-3,6-dioxaheptanoic acid	2000	0.05	---	---	1	4	0.02500
Perfluoro (2-ethoxyethane) sulfonic acid	2000	0.04	---	---	1	4	0.02230
Perfluoro-1-butanesulfonate	2000	0.05	---	---	1	4	0.02500
Perfluoro-1-decanesulfonate	2000	0.05	---	---	1	4	0.02525
Perfluoro-1-dodecanesulfonate	2000	0.05	---	---	1	4	0.02425
Perfluoro-1-heptanesulfonate	2000	0.05	---	---	1	4	0.02500
Perfluoro-1-hexanesulfonate	2000	0.05	---	---	1	4	0.02500
Perfluoro-1-nonanesulfonate	2000	0.05	---	---	1	4	0.02525
Perfluoro-1-octanesulfonamide	2000	0.05	---	---	1	4	0.02500
Perfluoro-1-octanesulfonate	2000	0.05	---	---	1	4	0.02500
perfluoro-1-pentanesulfonate	2000	0.05	---	---	1	4	0.02500
Perfluoro-3-methoxypropanoic acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-4-methoxybutanoic acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-butanoic Acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-decanoic Acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-dodecanoic acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-heptanoic Acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-hexadecanoic acid	2000	0.05	---	---	1	4	0.02500

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ81

Description: PFAS DoD ICAL Low Stock 2

Perfluoro-n-hexanoic acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-octadecanoic acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-octanoic Acid	2000	0.05	---	---	1	4	0.02500
Perfluorononanoic Acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-pentanoic acid	2000	0.05	---	---	1	4	0.02525
Perfluoro-n-tetradecanoic acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-tridecanoic acid	2000	0.05	---	---	1	4	0.02500
Perfluoro-n-undecanoic acid	2000	0.05	---	---	1	4	0.02500

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.02500
1H,1H,2H,2H-Perfluorodecane sulfonate	.02525
1H,1H,2H,2H-perfluorododecane sulfonate	.02415
1H,1H,2H,2H-Perfluorohexane sulfonate	.02500
1H,1H,2H,2H-Perfluorooctane sulfonate	.02500
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.02500
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.02500
3-Perfluoroheptyl propanoic acid	.02500
3-Perfluoropentyl propanoic acid	.02500
3-perfluoropropyl propanoic Acid	.02500
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.02500
Adona	.02500
Hexafluoropropylene oxide dimer acid	.02500
N-ethylperfluoro-1-octanesulfonamide	.02500
N-ethylperfluoro-octanesulfonamidoacetic acid	.02500
N-methylperfluoro-1-octanesulfonamide	.02500
N-methylperfluoro-1-octanesulfonamidoacetic acid	.02500
nonafluoro-3,6-dioxaheptanoic acid	.02500
Perfluoro (2-ethoxyethane) sulfonic acid	.02230
Perfluoro-1-butanesulfonate	.02500
Perfluoro-1-decanesulfonate	.02525
Perfluoro-1-dodecanesulfonate	.02425
Perfluoro-1-heptanesulfonate	.02500
Perfluoro-1-hexanesulfonate	.02500
Perfluoro-1-nonanesulfonate	.02525
Perfluoro-1-octanesulfonamide	.02500
Perfluoro-1-octanesulfonate	.02500
perfluoro-1-pentanesulfonate	.02500

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ81**

Description: PFAS DoD ICAL Low Stock 2

Perfluoro-3-methoxypropanoic acid	.02500
Perfluoro-4-methoxybutanoic acid	.02500
Perfluoro-n-butanoic Acid	.02500
Perfluoro-n-decanoic Acid	.02500
Perfluoro-n-dodecanoic acid	.02500
Perfluoro-n-heptanoic Acid	.02500
Perfluoro-n-hexadecanoic acid	.02500
Perfluoro-n-hexanoic acid	.02500
Perfluoro-n-octadecanoic acid	.02500
Perfluoro-n-octanoic Acid	.02500
Perfluorononanoic Acid	.02500
Perfluoro-n-pentanoic acid	.02525
Perfluoro-n-tetradecanoic acid	.02500
Perfluoro-n-tridecanoic acid	.02500
Perfluoro-n-undecanoic acid	.02500

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LZ80	Pipette	B820865811

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 6/8/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment:

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ83

Description: PFAS DoD ICAL L2

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	100	0.50	---	---	1	10	0.00500
d3-MeFOSA	100	0.50	---	---	1	10	0.00500
d5-EtFOSA	100	0.50	---	---	1	10	0.00500
d7-MeFOSE	100	0.50	---	---	1	10	0.00500
d9-EtFOSE	100	0.50	---	---	1	10	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	100	0.50	---	---	1	10	0.00500
13C2-PFTeDA	100	0.50	---	---	1	10	0.00500
13C3-HFPO-DA	100	0.50	---	---	1	10	0.00500
13C3-PFBS	100	0.47	---	---	1	10	0.00466
13C3-PFHxS	100	0.47	---	---	1	10	0.00474
13C4-PFHpA	100	0.50	---	---	1	10	0.00500
13C5-PFHxA	100	0.50	---	---	1	10	0.00500
13C6-PFDA	100	0.50	---	---	1	10	0.00500
13C7-PFUnA	100	0.50	---	---	1	10	0.00500
13C8-PFOA	100	0.50	---	---	1	10	0.00500
13C8-PFOS	100	0.48	---	---	1	10	0.00479
13C9-PFNA	100	0.50	---	---	1	10	0.00500
d3-MeFOSAA	100	0.50	---	---	1	10	0.00500
d5-EtFOSAA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	100	0.50	---	---	1	10	0.00500
13C2-PFOA	100	0.50	---	---	1	10	0.00500
13C3-PFBA	100	0.50	---	---	1	10	0.00500
13C4-PFOS	100	0.48	---	---	1	10	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	100	0.47	---	---	1	10	0.00469
13C2-6:2FTS	100	0.48	---	---	1	10	0.00476
13C2-8:2FTS	100	0.48	---	---	1	10	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ83

Description: PFAS DoD ICAL L2

13C4-PFBA	100	0.50	---	---	1	10	0.00500
13C5-PFPeA	100	0.50	---	---	1	10	0.00500
13C8-FOSA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ81

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	50	0.03	---	---	1	10	0.00013
1H,1H,2H,2H-Perfluorodecane sulfonate	50	0.03	---	---	1	10	0.00013
1H,1H,2H,2H-perfluorododecane sulfonate	50	0.02	---	---	1	10	0.00012
1H,1H,2H,2H-Perfluorohexane sulfonate	50	0.03	---	---	1	10	0.00013
1H,1H,2H,2H-Perfluorooctane sulfonate	50	0.03	---	---	1	10	0.00013
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	50	0.03	---	---	1	10	0.00013
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	50	0.03	---	---	1	10	0.00013
3-Perfluoroheptyl propanoic acid	50	0.03	---	---	1	10	0.00013
3-Perfluoropentyl propanoic acid	50	0.03	---	---	1	10	0.00013
3-perfluoropropyl propanoic Acid	50	0.03	---	---	1	10	0.00013
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	50	0.03	---	---	1	10	0.00013
Adona	50	0.03	---	---	1	10	0.00013
Hexafluoropropylene oxide dimer acid	50	0.03	---	---	1	10	0.00013
N-ethylperfluoro-1-octanesulfonamide	50	0.03	---	---	1	10	0.00013
N-ethylperfluoro-octanesulfonamidoacetic acid	50	0.03	---	---	1	10	0.00013
N-methylperfluoro-1-octanesulfonamide	50	0.03	---	---	1	10	0.00013
N-methylperfluoro-1-octanesulfonamidoacetic acid	50	0.03	---	---	1	10	0.00013
nonafluoro-3,6-dioxaheptanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro (2-ethoxyethane) sulfonic acid	50	0.02	---	---	1	10	0.00011
Perfluoro-1-butanesulfonate	50	0.03	---	---	1	10	0.00013
Perfluoro-1-decanesulfonate	50	0.03	---	---	1	10	0.00013
Perfluoro-1-dodecanesulfonate	50	0.02	---	---	1	10	0.00012
Perfluoro-1-heptanesulfonate	50	0.03	---	---	1	10	0.00013
Perfluoro-1-hexanesulfonate	50	0.03	---	---	1	10	0.00013
Perfluoro-1-nonanesulfonate	50	0.03	---	---	1	10	0.00013
Perfluoro-1-octanesulfonamide	50	0.03	---	---	1	10	0.00013
Perfluoro-1-octanesulfonate	50	0.03	---	---	1	10	0.00013
perfluoro-1-pentanesulfonate	50	0.03	---	---	1	10	0.00013
Perfluoro-3-methoxypropanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro-4-methoxybutanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-butanoic Acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-decanoic Acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-dodecanoic acid	50	0.03	---	---	1	10	0.00013

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ83

Description: PFAS DoD ICAL L2

Perfluoro-n-heptanoic Acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-hexadecanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-hexanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-octadecanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-octanoic Acid	50	0.03	---	---	1	10	0.00013
Perfluorononanoic Acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-pentanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-tetradecanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-tridecanoic acid	50	0.03	---	---	1	10	0.00013
Perfluoro-n-undecanoic acid	50	0.03	---	---	1	10	0.00013

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.00013
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.00013
1H,1H,2H,2H-perfluorododecane sulfonate	.00012

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ83

Description: PFAS DoD ICAL L2

1H,1H,2H,2H-Perfluorohexane sulfonate	.00013
1H,1H,2H,2H-Perfluorooctane sulfonate	.00013
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.00013
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.00013
3-Perfluoroheptyl propanoic acid	.00013
3-Perfluoropentyl propanoic acid	.00013
3-perfluoropropyl propanoic Acid	.00013
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.00013
Adona	.00013
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.00013
N-ethylperfluoro-1-octanesulfonamide	.00013
N-ethylperfluoro-octanesulfonamidoacetic acid	.00013
N-methylperfluoro-1-octanesulfonamide	.00013
N-methylperfluoro-1-octanesulfonamidoacetic acid	.00013
nonafluoro-3,6-dioxaheptanoic acid	.00013
Perfluoro (2-ethoxyethane) sulfonic acid	.00011
Perfluoro-1-butanesulfonate	.00013
Perfluoro-1-decanesulfonate	.00013
Perfluoro-1-dodecanesulfonate	.00012
Perfluoro-1-heptanesulfonate	.00013
Perfluoro-1-hexanesulfonate	.00013
Perfluoro-1-nonanesulfonate	.00013
Perfluoro-1-octanesulfonamide	.00013
Perfluoro-1-octanesulfonate	.00013
perfluoro-1-pentanesulfonate	.00013
Perfluoro-3-methoxypropanoic acid	.00013
Perfluoro-4-methoxybutanoic acid	.00013
Perfluoro-n-butanoic Acid	.00013
Perfluoro-n-decanoic Acid	.00013
Perfluoro-n-dodecanoic acid	.00013
Perfluoro-n-heptanoic Acid	.00013
Perfluoro-n-hexadecanoic acid	.00013
Perfluoro-n-hexanoic acid	.00013

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ83**

Description: PFAS DoD ICAL L2

Perfluoro-n-octadecanoic acid	.00013
Perfluoro-n-octanoic Acid	.00013
Perfluorononanoic Acid	.00013
Perfluoro-n-pentanoic acid	.00013
Perfluoro-n-tetradecanoic acid	.00013
Perfluoro-n-tridecanoic acid	.00013
Perfluoro-n-undecanoic acid	.00013

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	C202360925
LX92	Pipette	C202360925
LZ07	Pipette	C202360925
LZ39	Pipette	C202360925
LZ81	Pipette	C202360925

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ84

Description: PFAS DoD ICAL L3

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	400	0.50	---	---	1	40	0.00500
d3-MeFOSA	400	0.50	---	---	1	40	0.00500
d5-EtFOSA	400	0.50	---	---	1	40	0.00500
d7-MeFOSE	400	0.50	---	---	1	40	0.00500
d9-EtFOSE	400	0.50	---	---	1	40	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	400	0.50	---	---	1	40	0.00500
13C2-PFTeDA	400	0.50	---	---	1	40	0.00500
13C3-HFPO-DA	400	0.50	---	---	1	40	0.00500
13C3-PFBS	400	0.47	---	---	1	40	0.00466
13C3-PFHxS	400	0.47	---	---	1	40	0.00474
13C4-PFHpA	400	0.50	---	---	1	40	0.00500
13C5-PFHxA	400	0.50	---	---	1	40	0.00500
13C6-PFDA	400	0.50	---	---	1	40	0.00500
13C7-PFUnA	400	0.50	---	---	1	40	0.00500
13C8-PFOA	400	0.50	---	---	1	40	0.00500
13C8-PFOS	400	0.48	---	---	1	40	0.00479
13C9-PFNA	400	0.50	---	---	1	40	0.00500
d3-MeFOSAA	400	0.50	---	---	1	40	0.00500
d5-EtFOSAA	400	0.50	---	---	1	40	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	400	0.50	---	---	1	40	0.00500
13C2-PFOA	400	0.50	---	---	1	40	0.00500
13C3-PFBA	400	0.50	---	---	1	40	0.00500
13C4-PFOS	400	0.48	---	---	1	40	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	400	0.47	---	---	1	40	0.00469
13C2-6:2FTS	400	0.48	---	---	1	40	0.00476
13C2-8:2FTS	400	0.48	---	---	1	40	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ84

Description: PFAS DoD ICAL L3

13C4-PFBA	400	0.50	---	---	1	40	0.00500
13C5-PFPeA	400	0.50	---	---	1	40	0.00500
13C8-FOSA	400	0.50	---	---	1	40	0.00500

Stock Id: LZ80

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	200	0.05	---	---	1	40	0.00025
1H,1H,2H,2H-Perfluorodecane sulfonate	200	0.05	---	---	1	40	0.00025
1H,1H,2H,2H-perfluorododecane sulfonate	200	0.05	---	---	1	40	0.00024
1H,1H,2H,2H-Perfluorohexane sulfonate	200	0.05	---	---	1	40	0.00025
1H,1H,2H,2H-Perfluorooctane sulfonate	200	0.05	---	---	1	40	0.00025
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	200	0.05	---	---	1	40	0.00025
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	200	0.05	---	---	1	40	0.00025
3-Perfluoroheptyl propanoic acid	200	0.05	---	---	1	40	0.00025
3-Perfluoropentyl propanoic acid	200	0.05	---	---	1	40	0.00025
3-perfluoropropyl propanoic Acid	200	0.05	---	---	1	40	0.00025
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	200	0.05	---	---	1	40	0.00025
Adona	200	0.05	---	---	1	40	0.00025
Hexafluoropropylene oxide dimer acid	200	0.05	---	---	1	40	0.00025
N-ethylperfluoro-1-octanesulfonamide	200	0.05	---	---	1	40	0.00025
N-ethylperfluoro-octanesulfonamidoacetic acid	200	0.05	---	---	1	40	0.00025
N-methylperfluoro-1-octanesulfonamide	200	0.05	---	---	1	40	0.00025
N-methylperfluoro-1-octanesulfonamidoacetic acid	200	0.05	---	---	1	40	0.00025
nonafluoro-3,6-dioxaheptanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro (2-ethoxyethane) sulfonic acid	200	0.04	---	---	1	40	0.00022
Perfluoro-1-butanesulfonate	200	0.05	---	---	1	40	0.00025
Perfluoro-1-decanesulfonate	200	0.05	---	---	1	40	0.00025
Perfluoro-1-dodecanesulfonate	200	0.05	---	---	1	40	0.00024
Perfluoro-1-heptanesulfonate	200	0.05	---	---	1	40	0.00025
Perfluoro-1-hexanesulfonate	200	0.05	---	---	1	40	0.00025
Perfluoro-1-nonanesulfonate	200	0.05	---	---	1	40	0.00025
Perfluoro-1-octanesulfonamide	200	0.05	---	---	1	40	0.00025
Perfluoro-1-octanesulfonate	200	0.05	---	---	1	40	0.00025
perfluoro-1-pentanesulfonate	200	0.05	---	---	1	40	0.00025
Perfluoro-3-methoxypropanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro-4-methoxybutanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-butanoic Acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-decanoic Acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-dodecanoic acid	200	0.05	---	---	1	40	0.00025

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ84**

Description: PFAS DoD ICAL L3

Perfluoro-n-heptanoic Acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-hexadecanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-hexanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-octadecanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-octanoic Acid	200	0.05	---	---	1	40	0.00025
Perfluorononanoic Acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-pentanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-tetradecanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-tridecanoic acid	200	0.05	---	---	1	40	0.00025
Perfluoro-n-undecanoic acid	200	0.05	---	---	1	40	0.00025

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.00025
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.00025
1H,1H,2H,2H-perfluorododecane sulfonate	.00024

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ84**

Description: PFAS DoD ICAL L3

1H,1H,2H,2H-Perfluorohexane sulfonate	.00025
1H,1H,2H,2H-Perfluorooctane sulfonate	.00025
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.00025
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.00025
3-Perfluoroheptyl propanoic acid	.00025
3-Perfluoropentyl propanoic acid	.00025
3-perfluoropropyl propanoic Acid	.00025
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.00025
Adona	.00025
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.00025
N-ethylperfluoro-1-octanesulfonamide	.00025
N-ethylperfluoro-octanesulfonamidoacetic acid	.00025
N-methylperfluoro-1-octanesulfonamide	.00025
N-methylperfluoro-1-octanesulfonamidoacetic acid	.00025
nonafluoro-3,6-dioxaheptanoic acid	.00025
Perfluoro (2-ethoxyethane) sulfonic acid	.00022
Perfluoro-1-butanesulfonate	.00025
Perfluoro-1-decanesulfonate	.00025
Perfluoro-1-dodecanesulfonate	.00024
Perfluoro-1-heptanesulfonate	.00025
Perfluoro-1-hexanesulfonate	.00025
Perfluoro-1-nonanesulfonate	.00025
Perfluoro-1-octanesulfonamide	.00025
Perfluoro-1-octanesulfonate	.00025
perfluoro-1-pentanesulfonate	.00025
Perfluoro-3-methoxypropanoic acid	.00025
Perfluoro-4-methoxybutanoic acid	.00025
Perfluoro-n-butanoic Acid	.00025
Perfluoro-n-decanoic Acid	.00025
Perfluoro-n-dodecanoic acid	.00025
Perfluoro-n-heptanoic Acid	.00025
Perfluoro-n-hexadecanoic acid	.00025
Perfluoro-n-hexanoic acid	.00025

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ84**

Description: PFAS DoD ICAL L3

Perfluoro-n-octadecanoic acid	.00025
Perfluoro-n-octanoic Acid	.00025
Perfluorononanoic Acid	.00025
Perfluoro-n-pentanoic acid	.00025
Perfluoro-n-tetradecanoic acid	.00025
Perfluoro-n-tridecanoic acid	.00025
Perfluoro-n-undecanoic acid	.00025

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	B820865811
LX92	Pipette	B820865811
LZ07	Pipette	B820865811
LZ39	Pipette	B820865811
LZ80	Pipette	B814657482

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ85

Description: PFAS DoD ICAL L4

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	100	0.50	---	---	1	10	0.00500
d3-MeFOSA	100	0.50	---	---	1	10	0.00500
d5-EtFOSA	100	0.50	---	---	1	10	0.00500
d7-MeFOSE	100	0.50	---	---	1	10	0.00500
d9-EtFOSE	100	0.50	---	---	1	10	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	100	0.50	---	---	1	10	0.00500
13C2-PFTeDA	100	0.50	---	---	1	10	0.00500
13C3-HFPO-DA	100	0.50	---	---	1	10	0.00500
13C3-PFBS	100	0.47	---	---	1	10	0.00466
13C3-PFHxS	100	0.47	---	---	1	10	0.00474
13C4-PFHpA	100	0.50	---	---	1	10	0.00500
13C5-PFHxA	100	0.50	---	---	1	10	0.00500
13C6-PFDA	100	0.50	---	---	1	10	0.00500
13C7-PFUnA	100	0.50	---	---	1	10	0.00500
13C8-PFOA	100	0.50	---	---	1	10	0.00500
13C8-PFOS	100	0.48	---	---	1	10	0.00479
13C9-PFNA	100	0.50	---	---	1	10	0.00500
d3-MeFOSAA	100	0.50	---	---	1	10	0.00500
d5-EtFOSAA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	100	0.50	---	---	1	10	0.00500
13C2-PFOA	100	0.50	---	---	1	10	0.00500
13C3-PFBA	100	0.50	---	---	1	10	0.00500
13C4-PFOS	100	0.48	---	---	1	10	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	100	0.47	---	---	1	10	0.00469
13C2-6:2FTS	100	0.48	---	---	1	10	0.00476
13C2-8:2FTS	100	0.48	---	---	1	10	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ85

Description: PFAS DoD ICAL L4

13C4-PFBA	100	0.50	---	---	1	10	0.00500
13C5-PFPeA	100	0.50	---	---	1	10	0.00500
13C8-FOSA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ80

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	100	0.05	---	---	1	10	0.00050
1H,1H,2H,2H-Perfluorodecane sulfonate	100	0.05	---	---	1	10	0.00051
1H,1H,2H,2H-perfluorododecane sulfonate	100	0.05	---	---	1	10	0.00048
1H,1H,2H,2H-Perfluorohexane sulfonate	100	0.05	---	---	1	10	0.00050
1H,1H,2H,2H-Perfluorooctane sulfonate	100	0.05	---	---	1	10	0.00050
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	100	0.05	---	---	1	10	0.00050
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	100	0.05	---	---	1	10	0.00050
3-Perfluoroheptyl propanoic acid	100	0.05	---	---	1	10	0.00050
3-Perfluoropentyl propanoic acid	100	0.05	---	---	1	10	0.00050
3-perfluoropropyl propanoic Acid	100	0.05	---	---	1	10	0.00050
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	100	0.05	---	---	1	10	0.00050
Adona	100	0.05	---	---	1	10	0.00050
Hexafluoropropylene oxide dimer acid	100	0.05	---	---	1	10	0.00050
N-ethylperfluoro-1-octanesulfonamide	100	0.05	---	---	1	10	0.00050
N-ethylperfluoro-octanesulfonamidoacetic acid	100	0.05	---	---	1	10	0.00050
N-methylperfluoro-1-octanesulfonamide	100	0.05	---	---	1	10	0.00050
N-methylperfluoro-1-octanesulfonamidoacetic acid	100	0.05	---	---	1	10	0.00050
nonafluoro-3,6-dioxaheptanoic acid	100	0.05	---	---	1	10	0.00050
Perfluoro (2-ethoxyethane) sulfonic acid	100	0.04	---	---	1	10	0.00045
Perfluoro-1-butanesulfonate	100	0.05	---	---	1	10	0.00050
Perfluoro-1-decanesulfonate	100	0.05	---	---	1	10	0.00051
Perfluoro-1-dodecanesulfonate	100	0.05	---	---	1	10	0.00049
Perfluoro-1-heptanesulfonate	100	0.05	---	---	1	10	0.00050
Perfluoro-1-hexanesulfonate	100	0.05	---	---	1	10	0.00050
Perfluoro-1-nonanesulfonate	100	0.05	---	---	1	10	0.00051
Perfluoro-1-octanesulfonamide	100	0.05	---	---	1	10	0.00050
Perfluoro-1-octanesulfonate	100	0.05	---	---	1	10	0.00050
perfluoro-1-pentanesulfonate	100	0.05	---	---	1	10	0.00050
Perfluoro-3-methoxypropanoic acid	100	0.05	---	---	1	10	0.00050
Perfluoro-4-methoxybutanoic acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-butanoic Acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-decanoic Acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-dodecanoic acid	100	0.05	---	---	1	10	0.00050

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ85

Description: PFAS DoD ICAL L4

Perfluoro-n-heptanoic Acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-hexadecanoic acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-hexanoic acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-octadecanoic acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-octanoic Acid	100	0.05	---	---	1	10	0.00050
Perfluorononanoic Acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-pentanoic acid	100	0.05	---	---	1	10	0.00051
Perfluoro-n-tetradecanoic acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-tridecanoic acid	100	0.05	---	---	1	10	0.00050
Perfluoro-n-undecanoic acid	100	0.05	---	---	1	10	0.00050

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.00050
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.00051
1H,1H,2H,2H-perfluorododecane sulfonate	.00048

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ85

Description: PFAS DoD ICAL L4

1H,1H,2H,2H-Perfluorohexane sulfonate	.00050
1H,1H,2H,2H-Perfluorooctane sulfonate	.00050
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.00050
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.00050
3-Perfluoroheptyl propanoic acid	.00050
3-Perfluoropentyl propanoic acid	.00050
3-perfluoropropyl propanoic Acid	.00050
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.00050
Adona	.00050
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.00050
N-ethylperfluoro-1-octanesulfonamide	.00050
N-ethylperfluoro-octanesulfonamidoacetic acid	.00050
N-methylperfluoro-1-octanesulfonamide	.00050
N-methylperfluoro-1-octanesulfonamidoacetic acid	.00050
nonafluoro-3,6-dioxaheptanoic acid	.00050
Perfluoro (2-ethoxyethane) sulfonic acid	.00045
Perfluoro-1-butanesulfonate	.00050
Perfluoro-1-decanesulfonate	.00051
Perfluoro-1-dodecanesulfonate	.00049
Perfluoro-1-heptanesulfonate	.00050
Perfluoro-1-hexanesulfonate	.00050
Perfluoro-1-nonanesulfonate	.00051
Perfluoro-1-octanesulfonamide	.00050
Perfluoro-1-octanesulfonate	.00050
perfluoro-1-pentanesulfonate	.00050
Perfluoro-3-methoxypropanoic acid	.00050
Perfluoro-4-methoxybutanoic acid	.00050
Perfluoro-n-butanoic Acid	.00050
Perfluoro-n-decanoic Acid	.00050
Perfluoro-n-dodecanoic acid	.00050
Perfluoro-n-heptanoic Acid	.00050
Perfluoro-n-hexadecanoic acid	.00050
Perfluoro-n-hexanoic acid	.00050

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ85**

Description: PFAS DoD ICAL L4

Perfluoro-n-octadecanoic acid	.00050
Perfluoro-n-octanoic Acid	.00050
Perfluorononanoic Acid	.00050
Perfluoro-n-pentanoic acid	.00051
Perfluoro-n-tetradecanoic acid	.00050
Perfluoro-n-tridecanoic acid	.00050
Perfluoro-n-undecanoic acid	.00050

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	C202360925
LX92	Pipette	C202360925
LZ07	Pipette	C202360925
LZ39	Pipette	C202360925
LZ80	Pipette	C202360925

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ86

Description: PFAS DoD ICAL L5

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	400	0.50	---	---	1	40	0.00500
d3-MeFOSA	400	0.50	---	---	1	40	0.00500
d5-EtFOSA	400	0.50	---	---	1	40	0.00500
d7-MeFOSE	400	0.50	---	---	1	40	0.00500
d9-EtFOSE	400	0.50	---	---	1	40	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	400	0.50	---	---	1	40	0.00500
13C2-PFTeDA	400	0.50	---	---	1	40	0.00500
13C3-HFPO-DA	400	0.50	---	---	1	40	0.00500
13C3-PFBS	400	0.47	---	---	1	40	0.00466
13C3-PFHxS	400	0.47	---	---	1	40	0.00474
13C4-PFHpA	400	0.50	---	---	1	40	0.00500
13C5-PFHxA	400	0.50	---	---	1	40	0.00500
13C6-PFDA	400	0.50	---	---	1	40	0.00500
13C7-PFUnA	400	0.50	---	---	1	40	0.00500
13C8-PFOA	400	0.50	---	---	1	40	0.00500
13C8-PFOS	400	0.48	---	---	1	40	0.00479
13C9-PFNA	400	0.50	---	---	1	40	0.00500
d3-MeFOSAA	400	0.50	---	---	1	40	0.00500
d5-EtFOSAA	400	0.50	---	---	1	40	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	400	0.50	---	---	1	40	0.00500
13C2-PFOA	400	0.50	---	---	1	40	0.00500
13C3-PFBA	400	0.50	---	---	1	40	0.00500
13C4-PFOS	400	0.48	---	---	1	40	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	400	0.47	---	---	1	40	0.00469
13C2-6:2FTS	400	0.48	---	---	1	40	0.00476
13C2-8:2FTS	400	0.48	---	---	1	40	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ86

Description: PFAS DoD ICAL L5

13C4-PFBA	400	0.50	---	---	1	40	0.00500
13C5-PFPeA	400	0.50	---	---	1	40	0.00500
13C8-FOSA	400	0.50	---	---	1	40	0.00500

Stock Id: LZ80

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	800	0.05	---	---	1	40	0.00100
1H,1H,2H,2H-Perfluorodecane sulfonate	800	0.05	---	---	1	40	0.00101
1H,1H,2H,2H-perfluorododecane sulfonate	800	0.05	---	---	1	40	0.00097
1H,1H,2H,2H-Perfluorohexane sulfonate	800	0.05	---	---	1	40	0.00100
1H,1H,2H,2H-Perfluorooctane sulfonate	800	0.05	---	---	1	40	0.00100
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	800	0.05	---	---	1	40	0.00100
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	800	0.05	---	---	1	40	0.00100
3-Perfluoroheptyl propanoic acid	800	0.05	---	---	1	40	0.00100
3-Perfluoropentyl propanoic acid	800	0.05	---	---	1	40	0.00100
3-perfluoropropyl propanoic Acid	800	0.05	---	---	1	40	0.00100
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	800	0.05	---	---	1	40	0.00100
Adona	800	0.05	---	---	1	40	0.00100
Hexafluoropropylene oxide dimer acid	800	0.05	---	---	1	40	0.00100
N-ethylperfluoro-1-octanesulfonamide	800	0.05	---	---	1	40	0.00100
N-ethylperfluoro-octanesulfonamidoacetic acid	800	0.05	---	---	1	40	0.00100
N-methylperfluoro-1-octanesulfonamide	800	0.05	---	---	1	40	0.00100
N-methylperfluoro-1-octanesulfonamidoacetic acid	800	0.05	---	---	1	40	0.00100
nonafluoro-3,6-dioxaheptanoic acid	800	0.05	---	---	1	40	0.00100
Perfluoro (2-ethoxyethane) sulfonic acid	800	0.04	---	---	1	40	0.00089
Perfluoro-1-butanesulfonate	800	0.05	---	---	1	40	0.00100
Perfluoro-1-decanesulfonate	800	0.05	---	---	1	40	0.00101
Perfluoro-1-dodecanesulfonate	800	0.05	---	---	1	40	0.00097
Perfluoro-1-heptanesulfonate	800	0.05	---	---	1	40	0.00100
Perfluoro-1-hexanesulfonate	800	0.05	---	---	1	40	0.00100
Perfluoro-1-nonanesulfonate	800	0.05	---	---	1	40	0.00101
Perfluoro-1-octanesulfonamide	800	0.05	---	---	1	40	0.00100
Perfluoro-1-octanesulfonate	800	0.05	---	---	1	40	0.00100
perfluoro-1-pentanesulfonate	800	0.05	---	---	1	40	0.00100
Perfluoro-3-methoxypropanoic acid	800	0.05	---	---	1	40	0.00100
Perfluoro-4-methoxybutanoic acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-butanoic Acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-decanoic Acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-dodecanoic acid	800	0.05	---	---	1	40	0.00100

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ86**

Description: PFAS DoD ICAL L5

Perfluoro-n-heptanoic Acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-hexadecanoic acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-hexanoic acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-octadecanoic acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-octanoic Acid	800	0.05	---	---	1	40	0.00100
Perfluorononanoic Acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-pentanoic acid	800	0.05	---	---	1	40	0.00101
Perfluoro-n-tetradecanoic acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-tridecanoic acid	800	0.05	---	---	1	40	0.00100
Perfluoro-n-undecanoic acid	800	0.05	---	---	1	40	0.00100

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.00100
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.00101
1H,1H,2H,2H-perfluorododecane sulfonate	.00097

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ86

Description: PFAS DoD ICAL L5

1H,1H,2H,2H-Perfluorohexane sulfonate	.00100
1H,1H,2H,2H-Perfluorooctane sulfonate	.00100
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.00100
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.00100
3-Perfluoroheptyl propanoic acid	.00100
3-Perfluoropentyl propanoic acid	.00100
3-perfluoropropyl propanoic Acid	.00100
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.00100
Adona	.00100
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.00100
N-ethylperfluoro-1-octanesulfonamide	.00100
N-ethylperfluoro-octanesulfonamidoacetic acid	.00100
N-methylperfluoro-1-octanesulfonamide	.00100
N-methylperfluoro-1-octanesulfonamidoacetic acid	.00100
nonafluoro-3,6-dioxaheptanoic acid	.00100
Perfluoro (2-ethoxyethane) sulfonic acid	.00089
Perfluoro-1-butanesulfonate	.00100
Perfluoro-1-decanesulfonate	.00101
Perfluoro-1-dodecanesulfonate	.00097
Perfluoro-1-heptanesulfonate	.00100
Perfluoro-1-hexanesulfonate	.00100
Perfluoro-1-nonanesulfonate	.00101
Perfluoro-1-octanesulfonamide	.00100
Perfluoro-1-octanesulfonate	.00100
perfluoro-1-pentanesulfonate	.00100
Perfluoro-3-methoxypropanoic acid	.00100
Perfluoro-4-methoxybutanoic acid	.00100
Perfluoro-n-butanoic Acid	.00100
Perfluoro-n-decanoic Acid	.00100
Perfluoro-n-dodecanoic acid	.00100
Perfluoro-n-heptanoic Acid	.00100
Perfluoro-n-hexadecanoic acid	.00100
Perfluoro-n-hexanoic acid	.00100

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ86**

Description: PFAS DoD ICAL L5

Perfluoro-n-octadecanoic acid	.00100
Perfluoro-n-octanoic Acid	.00100
Perfluorononanoic Acid	.00100
Perfluoro-n-pentanoic acid	.00101
Perfluoro-n-tetradecanoic acid	.00100
Perfluoro-n-tridecanoic acid	.00100
Perfluoro-n-undecanoic acid	.00100

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	B820865811
LX92	Pipette	B820865811
LZ07	Pipette	B820865811
LZ39	Pipette	B820865811
LZ80	Pipette	B820865811

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:46:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ87

Description: PFAS DoD ICAL L6

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	400	0.50	---	---	1	40	0.00500
d3-MeFOSA	400	0.50	---	---	1	40	0.00500
d5-EtFOSA	400	0.50	---	---	1	40	0.00500
d7-MeFOSE	400	0.50	---	---	1	40	0.00500
d9-EtFOSE	400	0.50	---	---	1	40	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	400	0.50	---	---	1	40	0.00500
13C2-PFTeDA	400	0.50	---	---	1	40	0.00500
13C3-HFPO-DA	400	0.50	---	---	1	40	0.00500
13C3-PFBS	400	0.47	---	---	1	40	0.00466
13C3-PFHxS	400	0.47	---	---	1	40	0.00474
13C4-PFHpA	400	0.50	---	---	1	40	0.00500
13C5-PFHxA	400	0.50	---	---	1	40	0.00500
13C6-PFDA	400	0.50	---	---	1	40	0.00500
13C7-PFUnA	400	0.50	---	---	1	40	0.00500
13C8-PFOA	400	0.50	---	---	1	40	0.00500
13C8-PFOS	400	0.48	---	---	1	40	0.00479
13C9-PFNA	400	0.50	---	---	1	40	0.00500
d3-MeFOSAA	400	0.50	---	---	1	40	0.00500
d5-EtFOSAA	400	0.50	---	---	1	40	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	400	0.50	---	---	1	40	0.00500
13C2-PFOA	400	0.50	---	---	1	40	0.00500
13C3-PFBA	400	0.50	---	---	1	40	0.00500
13C4-PFOS	400	0.48	---	---	1	40	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	400	0.47	---	---	1	40	0.00469
13C2-6:2FTS	400	0.48	---	---	1	40	0.00476
13C2-8:2FTS	400	0.48	---	---	1	40	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ87

Description: PFAS DoD ICAL L6

13C4-PFBA	400	0.50	---	---	1	40	0.00500
13C5-PFPeA	400	0.50	---	---	1	40	0.00500
13C8-FOSA	400	0.50	---	---	1	40	0.00500

Stock Id: LZ79

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	200	0.50	---	---	1	40	0.00250
1H,1H,2H,2H-Perfluorodecane sulfonate	200	0.51	---	---	1	40	0.00253
1H,1H,2H,2H-perfluorododecane sulfonate	200	0.48	---	---	1	40	0.00242
1H,1H,2H,2H-Perfluorohexane sulfonate	200	0.50	---	---	1	40	0.00250
1H,1H,2H,2H-Perfluorooctane sulfonate	200	0.50	---	---	1	40	0.00250
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	200	0.50	---	---	1	40	0.00250
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	200	0.50	---	---	1	40	0.00250
3-Perfluoroheptyl propanoic acid	200	0.50	---	---	1	40	0.00250
3-Perfluoropentyl propanoic acid	200	0.50	---	---	1	40	0.00250
3-perfluoropropyl propanoic Acid	200	0.50	---	---	1	40	0.00250
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	200	0.50	---	---	1	40	0.00250
Adona	200	0.50	---	---	1	40	0.00250
Hexafluoropropylene oxide dimer acid	200	0.50	---	---	1	40	0.00250
N-ethylperfluoro-1-octanesulfonamide	200	0.50	---	---	1	40	0.00250
N-ethylperfluoro-octanesulfonamidoacetic acid	200	0.50	---	---	1	40	0.00250
N-methylperfluoro-1-octanesulfonamide	200	0.50	---	---	1	40	0.00250
N-methylperfluoro-1-octanesulfonamidoacetic acid	200	0.50	---	---	1	40	0.00250
nonafluoro-3,6-dioxaheptanoic acid	200	0.50	---	---	1	40	0.00250
Perfluoro (2-ethoxyethane) sulfonic acid	200	0.45	---	---	1	40	0.00223
Perfluoro-1-butanesulfonate	200	0.50	---	---	1	40	0.00250
Perfluoro-1-decanesulfonate	200	0.51	---	---	1	40	0.00253
Perfluoro-1-dodecanesulfonate	200	0.49	---	---	1	40	0.00243
Perfluoro-1-heptanesulfonate	200	0.50	---	---	1	40	0.00250
Perfluoro-1-hexanesulfonate	200	0.50	---	---	1	40	0.00250
Perfluoro-1-nonanesulfonate	200	0.51	---	---	1	40	0.00253
Perfluoro-1-octanesulfonamide	200	0.50	---	---	1	40	0.00250
Perfluoro-1-octanesulfonate	200	0.50	---	---	1	40	0.00250
perfluoro-1-pentanesulfonate	200	0.50	---	---	1	40	0.00250
Perfluoro-3-methoxypropanoic acid	200	0.50	---	---	1	40	0.00250
Perfluoro-4-methoxybutanoic acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-butanoic Acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-decanoic Acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-dodecanoic acid	200	0.50	---	---	1	40	0.00250

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ87

Description: PFAS DoD ICAL L6

Perfluoro-n-heptanoic Acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-hexadecanoic acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-hexanoic acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-octadecanoic acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-octanoic Acid	200	0.50	---	---	1	40	0.00250
Perfluorononanoic Acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-pentanoic acid	200	0.51	---	---	1	40	0.00253
Perfluoro-n-tetradecanoic acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-tridecanoic acid	200	0.50	---	---	1	40	0.00250
Perfluoro-n-undecanoic acid	200	0.50	---	---	1	40	0.00250

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.00250
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.00253
1H,1H,2H,2H-perfluorododecane sulfonate	.00242

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ87

Description: PFAS DoD ICAL L6

1H,1H,2H,2H-Perfluorohexane sulfonate	.00250
1H,1H,2H,2H-Perfluorooctane sulfonate	.00250
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.00250
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.00250
3-Perfluoroheptyl propanoic acid	.00250
3-Perfluoropentyl propanoic acid	.00250
3-perfluoropropyl propanoic Acid	.00250
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.00250
Adona	.00250
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.00250
N-ethylperfluoro-1-octanesulfonamide	.00250
N-ethylperfluoro-octanesulfonamidoacetic acid	.00250
N-methylperfluoro-1-octanesulfonamide	.00250
N-methylperfluoro-1-octanesulfonamidoacetic acid	.00250
nonafluoro-3,6-dioxaheptanoic acid	.00250
Perfluoro (2-ethoxyethane) sulfonic acid	.00223
Perfluoro-1-butanesulfonate	.00250
Perfluoro-1-decanesulfonate	.00253
Perfluoro-1-dodecanesulfonate	.00243
Perfluoro-1-heptanesulfonate	.00250
Perfluoro-1-hexanesulfonate	.00250
Perfluoro-1-nonanesulfonate	.00253
Perfluoro-1-octanesulfonamide	.00250
Perfluoro-1-octanesulfonate	.00250
perfluoro-1-pentanesulfonate	.00250
Perfluoro-3-methoxypropanoic acid	.00250
Perfluoro-4-methoxybutanoic acid	.00250
Perfluoro-n-butanoic Acid	.00250
Perfluoro-n-decanoic Acid	.00250
Perfluoro-n-dodecanoic acid	.00250
Perfluoro-n-heptanoic Acid	.00250
Perfluoro-n-hexadecanoic acid	.00250
Perfluoro-n-hexanoic acid	.00250

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ87**

Description: PFAS DoD ICAL L6

Perfluoro-n-octadecanoic acid	.00250
Perfluoro-n-octanoic Acid	.00250
Perfluorononanoic Acid	.00250
Perfluoro-n-pentanoic acid	.00253
Perfluoro-n-tetradecanoic acid	.00250
Perfluoro-n-tridecanoic acid	.00250
Perfluoro-n-undecanoic acid	.00250

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	B820865811
LX92	Pipette	B820865811
LZ07	Pipette	B820865811
LZ39	Pipette	B820865811
LZ79	Pipette	B814657482

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 4 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ88

Description: PFAS DoD ICAL L7

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	100	0.50	---	---	1	10	0.00500
d3-MeFOSA	100	0.50	---	---	1	10	0.00500
d5-EtFOSA	100	0.50	---	---	1	10	0.00500
d7-MeFOSE	100	0.50	---	---	1	10	0.00500
d9-EtFOSE	100	0.50	---	---	1	10	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	100	0.50	---	---	1	10	0.00500
13C2-PFTeDA	100	0.50	---	---	1	10	0.00500
13C3-HFPO-DA	100	0.50	---	---	1	10	0.00500
13C3-PFBS	100	0.47	---	---	1	10	0.00466
13C3-PFHxS	100	0.47	---	---	1	10	0.00474
13C4-PFHpA	100	0.50	---	---	1	10	0.00500
13C5-PFHxA	100	0.50	---	---	1	10	0.00500
13C6-PFDA	100	0.50	---	---	1	10	0.00500
13C7-PFUnA	100	0.50	---	---	1	10	0.00500
13C8-PFOA	100	0.50	---	---	1	10	0.00500
13C8-PFOS	100	0.48	---	---	1	10	0.00479
13C9-PFNA	100	0.50	---	---	1	10	0.00500
d3-MeFOSAA	100	0.50	---	---	1	10	0.00500
d5-EtFOSAA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	100	0.50	---	---	1	10	0.00500
13C2-PFOA	100	0.50	---	---	1	10	0.00500
13C3-PFBA	100	0.50	---	---	1	10	0.00500
13C4-PFOS	100	0.48	---	---	1	10	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	100	0.47	---	---	1	10	0.00469
13C2-6:2FTS	100	0.48	---	---	1	10	0.00476
13C2-8:2FTS	100	0.48	---	---	1	10	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ88

Description: PFAS DoD ICAL L7

13C4-PFBA	100	0.50	---	---	1	10	0.00500
13C5-PFPeA	100	0.50	---	---	1	10	0.00500
13C8-FOSA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ79

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	200	0.50	---	---	1	10	0.01000
1H,1H,2H,2H-Perfluorodecane sulfonate	200	0.51	---	---	1	10	0.01010
1H,1H,2H,2H-perfluorododecane sulfonate	200	0.48	---	---	1	10	0.00966
1H,1H,2H,2H-Perfluorohexane sulfonate	200	0.50	---	---	1	10	0.01000
1H,1H,2H,2H-Perfluorooctane sulfonate	200	0.50	---	---	1	10	0.01000
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	200	0.50	---	---	1	10	0.01000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	200	0.50	---	---	1	10	0.01000
3-Perfluoroheptyl propanoic acid	200	0.50	---	---	1	10	0.01000
3-Perfluoropentyl propanoic acid	200	0.50	---	---	1	10	0.01000
3-perfluoropropyl propanoic Acid	200	0.50	---	---	1	10	0.01000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	200	0.50	---	---	1	10	0.01000
Adona	200	0.50	---	---	1	10	0.01000
Hexafluoropropylene oxide dimer acid	200	0.50	---	---	1	10	0.01000
N-ethylperfluoro-1-octanesulfonamide	200	0.50	---	---	1	10	0.01000
N-ethylperfluoro-octanesulfonamidoacetic acid	200	0.50	---	---	1	10	0.01000
N-methylperfluoro-1-octanesulfonamide	200	0.50	---	---	1	10	0.01000
N-methylperfluoro-1-octanesulfonamidoacetic acid	200	0.50	---	---	1	10	0.01000
nonafluoro-3,6-dioxaheptanoic acid	200	0.50	---	---	1	10	0.01000
Perfluoro (2-ethoxyethane) sulfonic acid	200	0.45	---	---	1	10	0.00892
Perfluoro-1-butanesulfonate	200	0.50	---	---	1	10	0.01000
Perfluoro-1-decanesulfonate	200	0.51	---	---	1	10	0.01010
Perfluoro-1-dodecanesulfonate	200	0.49	---	---	1	10	0.00970
Perfluoro-1-heptanesulfonate	200	0.50	---	---	1	10	0.01000
Perfluoro-1-hexanesulfonate	200	0.50	---	---	1	10	0.01000
Perfluoro-1-nonanesulfonate	200	0.51	---	---	1	10	0.01010
Perfluoro-1-octanesulfonamide	200	0.50	---	---	1	10	0.01000
Perfluoro-1-octanesulfonate	200	0.50	---	---	1	10	0.01000
perfluoro-1-pentanesulfonate	200	0.50	---	---	1	10	0.01000
Perfluoro-3-methoxypropanoic acid	200	0.50	---	---	1	10	0.01000
Perfluoro-4-methoxybutanoic acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-butanoic Acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-decanoic Acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-dodecanoic acid	200	0.50	---	---	1	10	0.01000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ88

Description: PFAS DoD ICAL L7

Perfluoro-n-heptanoic Acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-hexadecanoic acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-hexanoic acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-octadecanoic acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-octanoic Acid	200	0.50	---	---	1	10	0.01000
Perfluorononanoic Acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-pentanoic acid	200	0.51	---	---	1	10	0.01010
Perfluoro-n-tetradecanoic acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-tridecanoic acid	200	0.50	---	---	1	10	0.01000
Perfluoro-n-undecanoic acid	200	0.50	---	---	1	10	0.01000

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.01000
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.01010
1H,1H,2H,2H-perfluorododecane sulfonate	.00966

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ88

Description: PFAS DoD ICAL L7

1H,1H,2H,2H-Perfluorohexane sulfonate	.01000
1H,1H,2H,2H-Perfluorooctane sulfonate	.01000
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.01000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.01000
3-Perfluoroheptyl propanoic acid	.01000
3-Perfluoropentyl propanoic acid	.01000
3-perfluoropropyl propanoic Acid	.01000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.01000
Adona	.01000
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.01000
N-ethylperfluoro-1-octanesulfonamide	.01000
N-ethylperfluoro-octanesulfonamidoacetic acid	.01000
N-methylperfluoro-1-octanesulfonamide	.01000
N-methylperfluoro-1-octanesulfonamidoacetic acid	.01000
nonafluoro-3,6-dioxaheptanoic acid	.01000
Perfluoro (2-ethoxyethane) sulfonic acid	.00892
Perfluoro-1-butanesulfonate	.01000
Perfluoro-1-decanesulfonate	.01010
Perfluoro-1-dodecanesulfonate	.00970
Perfluoro-1-heptanesulfonate	.01000
Perfluoro-1-hexanesulfonate	.01000
Perfluoro-1-nonanesulfonate	.01010
Perfluoro-1-octanesulfonamide	.01000
Perfluoro-1-octanesulfonate	.01000
perfluoro-1-pentanesulfonate	.01000
Perfluoro-3-methoxypropanoic acid	.01000
Perfluoro-4-methoxybutanoic acid	.01000
Perfluoro-n-butanoic Acid	.01000
Perfluoro-n-decanoic Acid	.01000
Perfluoro-n-dodecanoic acid	.01000
Perfluoro-n-heptanoic Acid	.01000
Perfluoro-n-hexadecanoic acid	.01000
Perfluoro-n-hexanoic acid	.01000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ88

Description: PFAS DoD ICAL L7

Perfluoro-n-octadecanoic acid	.01000
Perfluoro-n-octanoic Acid	.01000
Perfluorononanoic Acid	.01000
Perfluoro-n-pentanoic acid	.01010
Perfluoro-n-tetradecanoic acid	.01000
Perfluoro-n-tridecanoic acid	.01000
Perfluoro-n-undecanoic acid	.01000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	C202360925
LX92	Pipette	C202360925
LZ07	Pipette	C202360925
LZ39	Pipette	C202360925
LZ79	Pipette	B814657482

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ89

Description: PFAS DoD ICAL L8

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	100	0.50	---	---	1	10	0.00500
d3-MeFOSA	100	0.50	---	---	1	10	0.00500
d5-EtFOSA	100	0.50	---	---	1	10	0.00500
d7-MeFOSE	100	0.50	---	---	1	10	0.00500
d9-EtFOSE	100	0.50	---	---	1	10	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	100	0.50	---	---	1	10	0.00500
13C2-PFTeDA	100	0.50	---	---	1	10	0.00500
13C3-HFPO-DA	100	0.50	---	---	1	10	0.00500
13C3-PFBS	100	0.47	---	---	1	10	0.00466
13C3-PFHxS	100	0.47	---	---	1	10	0.00474
13C4-PFHpA	100	0.50	---	---	1	10	0.00500
13C5-PFHxA	100	0.50	---	---	1	10	0.00500
13C6-PFDA	100	0.50	---	---	1	10	0.00500
13C7-PFUnA	100	0.50	---	---	1	10	0.00500
13C8-PFOA	100	0.50	---	---	1	10	0.00500
13C8-PFOS	100	0.48	---	---	1	10	0.00479
13C9-PFNA	100	0.50	---	---	1	10	0.00500
d3-MeFOSAA	100	0.50	---	---	1	10	0.00500
d5-EtFOSAA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	100	0.50	---	---	1	10	0.00500
13C2-PFOA	100	0.50	---	---	1	10	0.00500
13C3-PFBA	100	0.50	---	---	1	10	0.00500
13C4-PFOS	100	0.48	---	---	1	10	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	100	0.47	---	---	1	10	0.00469
13C2-6:2FTS	100	0.48	---	---	1	10	0.00476
13C2-8:2FTS	100	0.48	---	---	1	10	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ89

Description: PFAS DoD ICAL L8

13C4-PFBA	100	0.50	---	---	1	10	0.00500
13C5-PFPeA	100	0.50	---	---	1	10	0.00500
13C8-FOSA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ79

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	500	0.50	---	---	1	10	0.02500
1H,1H,2H,2H-Perfluorodecane sulfonate	500	0.51	---	---	1	10	0.02525
1H,1H,2H,2H-perfluorododecane sulfonate	500	0.48	---	---	1	10	0.02415
1H,1H,2H,2H-Perfluorohexane sulfonate	500	0.50	---	---	1	10	0.02500
1H,1H,2H,2H-Perfluorooctane sulfonate	500	0.50	---	---	1	10	0.02500
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	500	0.50	---	---	1	10	0.02500
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	500	0.50	---	---	1	10	0.02500
3-Perfluoroheptyl propanoic acid	500	0.50	---	---	1	10	0.02500
3-Perfluoropentyl propanoic acid	500	0.50	---	---	1	10	0.02500
3-perfluoropropyl propanoic Acid	500	0.50	---	---	1	10	0.02500
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	500	0.50	---	---	1	10	0.02500
Adona	500	0.50	---	---	1	10	0.02500
Hexafluoropropylene oxide dimer acid	500	0.50	---	---	1	10	0.02500
N-ethylperfluoro-1-octanesulfonamide	500	0.50	---	---	1	10	0.02500
N-ethylperfluoro-octanesulfonamidoacetic acid	500	0.50	---	---	1	10	0.02500
N-methylperfluoro-1-octanesulfonamide	500	0.50	---	---	1	10	0.02500
N-methylperfluoro-1-octanesulfonamidoacetic acid	500	0.50	---	---	1	10	0.02500
nonafluoro-3,6-dioxaheptanoic acid	500	0.50	---	---	1	10	0.02500
Perfluoro (2-ethoxyethane) sulfonic acid	500	0.45	---	---	1	10	0.02230
Perfluoro-1-butanesulfonate	500	0.50	---	---	1	10	0.02500
Perfluoro-1-decanesulfonate	500	0.51	---	---	1	10	0.02525
Perfluoro-1-dodecanesulfonate	500	0.49	---	---	1	10	0.02425
Perfluoro-1-heptanesulfonate	500	0.50	---	---	1	10	0.02500
Perfluoro-1-hexanesulfonate	500	0.50	---	---	1	10	0.02500
Perfluoro-1-nonanesulfonate	500	0.51	---	---	1	10	0.02525
Perfluoro-1-octanesulfonamide	500	0.50	---	---	1	10	0.02500
Perfluoro-1-octanesulfonate	500	0.50	---	---	1	10	0.02500
perfluoro-1-pentanesulfonate	500	0.50	---	---	1	10	0.02500
Perfluoro-3-methoxypropanoic acid	500	0.50	---	---	1	10	0.02500
Perfluoro-4-methoxybutanoic acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-butanoic Acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-decanoic Acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-dodecanoic acid	500	0.50	---	---	1	10	0.02500

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ89**

Description: PFAS DoD ICAL L8

Perfluoro-n-heptanoic Acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-hexadecanoic acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-hexanoic acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-octadecanoic acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-octanoic Acid	500	0.50	---	---	1	10	0.02500
Perfluorononanoic Acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-pentanoic acid	500	0.51	---	---	1	10	0.02525
Perfluoro-n-tetradecanoic acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-tridecanoic acid	500	0.50	---	---	1	10	0.02500
Perfluoro-n-undecanoic acid	500	0.50	---	---	1	10	0.02500

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.02500
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.02525
1H,1H,2H,2H-perfluorododecane sulfonate	.02415

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ89**

Description: PFAS DoD ICAL L8

1H,1H,2H,2H-Perfluorohexane sulfonate	.02500
1H,1H,2H,2H-Perfluorooctane sulfonate	.02500
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.02500
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.02500
3-Perfluoroheptyl propanoic acid	.02500
3-Perfluoropentyl propanoic acid	.02500
3-perfluoropropyl propanoic Acid	.02500
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.02500
Adona	.02500
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.02500
N-ethylperfluoro-1-octanesulfonamide	.02500
N-ethylperfluoro-octanesulfonamidoacetic acid	.02500
N-methylperfluoro-1-octanesulfonamide	.02500
N-methylperfluoro-1-octanesulfonamidoacetic acid	.02500
nonafluoro-3,6-dioxaheptanoic acid	.02500
Perfluoro (2-ethoxyethane) sulfonic acid	.02230
Perfluoro-1-butanesulfonate	.02500
Perfluoro-1-decanesulfonate	.02525
Perfluoro-1-dodecanesulfonate	.02425
Perfluoro-1-heptanesulfonate	.02500
Perfluoro-1-hexanesulfonate	.02500
Perfluoro-1-nonanesulfonate	.02525
Perfluoro-1-octanesulfonamide	.02500
Perfluoro-1-octanesulfonate	.02500
perfluoro-1-pentanesulfonate	.02500
Perfluoro-3-methoxypropanoic acid	.02500
Perfluoro-4-methoxybutanoic acid	.02500
Perfluoro-n-butanoic Acid	.02500
Perfluoro-n-decanoic Acid	.02500
Perfluoro-n-dodecanoic acid	.02500
Perfluoro-n-heptanoic Acid	.02500
Perfluoro-n-hexadecanoic acid	.02500
Perfluoro-n-hexanoic acid	.02500

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ89**

Description: PFAS DoD ICAL L8

Perfluoro-n-octadecanoic acid	.02500
Perfluoro-n-octanoic Acid	.02500
Perfluorononanoic Acid	.02500
Perfluoro-n-pentanoic acid	.02525
Perfluoro-n-tetradecanoic acid	.02500
Perfluoro-n-tridecanoic acid	.02500
Perfluoro-n-undecanoic acid	.02500

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	C202360925
LX92	Pipette	C202360925
LZ07	Pipette	C202360925
LZ39	Pipette	C202360925
LZ79	Pipette	B820865811

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ90

Description: PFAS DoD ICAL L9

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	100	0.50	---	---	1	10	0.00500
d3-MeFOSA	100	0.50	---	---	1	10	0.00500
d5-EtFOSA	100	0.50	---	---	1	10	0.00500
d7-MeFOSE	100	0.50	---	---	1	10	0.00500
d9-EtFOSE	100	0.50	---	---	1	10	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	100	0.50	---	---	1	10	0.00500
13C2-PFTeDA	100	0.50	---	---	1	10	0.00500
13C3-HFPO-DA	100	0.50	---	---	1	10	0.00500
13C3-PFBS	100	0.47	---	---	1	10	0.00466
13C3-PFHxS	100	0.47	---	---	1	10	0.00474
13C4-PFHpA	100	0.50	---	---	1	10	0.00500
13C5-PFHxA	100	0.50	---	---	1	10	0.00500
13C6-PFDA	100	0.50	---	---	1	10	0.00500
13C7-PFUnA	100	0.50	---	---	1	10	0.00500
13C8-PFOA	100	0.50	---	---	1	10	0.00500
13C8-PFOS	100	0.48	---	---	1	10	0.00479
13C9-PFNA	100	0.50	---	---	1	10	0.00500
d3-MeFOSAA	100	0.50	---	---	1	10	0.00500
d5-EtFOSAA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	100	0.50	---	---	1	10	0.00500
13C2-PFOA	100	0.50	---	---	1	10	0.00500
13C3-PFBA	100	0.50	---	---	1	10	0.00500
13C4-PFOS	100	0.48	---	---	1	10	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	100	0.47	---	---	1	10	0.00469
13C2-6:2FTS	100	0.48	---	---	1	10	0.00476
13C2-8:2FTS	100	0.48	---	---	1	10	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ90

Description: PFAS DoD ICAL L9

13C4-PFBA	100	0.50	---	---	1	10	0.00500
13C5-PFPeA	100	0.50	---	---	1	10	0.00500
13C8-FOSA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ79

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	1000	0.50	---	---	1	10	0.05000
1H,1H,2H,2H-Perfluorodecane sulfonate	1000	0.51	---	---	1	10	0.05050
1H,1H,2H,2H-perfluorododecane sulfonate	1000	0.48	---	---	1	10	0.04830
1H,1H,2H,2H-Perfluorohexane sulfonate	1000	0.50	---	---	1	10	0.05000
1H,1H,2H,2H-Perfluorooctane sulfonate	1000	0.50	---	---	1	10	0.05000
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	1000	0.50	---	---	1	10	0.05000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	1000	0.50	---	---	1	10	0.05000
3-Perfluoroheptyl propanoic acid	1000	0.50	---	---	1	10	0.05000
3-Perfluoropentyl propanoic acid	1000	0.50	---	---	1	10	0.05000
3-perfluoropropyl propanoic Acid	1000	0.50	---	---	1	10	0.05000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	1000	0.50	---	---	1	10	0.05000
Adona	1000	0.50	---	---	1	10	0.05000
Hexafluoropropylene oxide dimer acid	1000	0.50	---	---	1	10	0.05000
N-ethylperfluoro-1-octanesulfonamide	1000	0.50	---	---	1	10	0.05000
N-ethylperfluoro-octanesulfonamidoacetic acid	1000	0.50	---	---	1	10	0.05000
N-methylperfluoro-1-octanesulfonamide	1000	0.50	---	---	1	10	0.05000
N-methylperfluoro-1-octanesulfonamidoacetic acid	1000	0.50	---	---	1	10	0.05000
nonafluoro-3,6-dioxaheptanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro (2-ethoxyethane) sulfonic acid	1000	0.45	---	---	1	10	0.04460
Perfluoro-1-butanesulfonate	1000	0.50	---	---	1	10	0.05000
Perfluoro-1-decanesulfonate	1000	0.51	---	---	1	10	0.05050
Perfluoro-1-dodecanesulfonate	1000	0.49	---	---	1	10	0.04850
Perfluoro-1-heptanesulfonate	1000	0.50	---	---	1	10	0.05000
Perfluoro-1-hexanesulfonate	1000	0.50	---	---	1	10	0.05000
Perfluoro-1-nonanesulfonate	1000	0.51	---	---	1	10	0.05050
Perfluoro-1-octanesulfonamide	1000	0.50	---	---	1	10	0.05000
Perfluoro-1-octanesulfonate	1000	0.50	---	---	1	10	0.05000
perfluoro-1-pentanesulfonate	1000	0.50	---	---	1	10	0.05000
Perfluoro-3-methoxypropanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-4-methoxybutanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-butanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-decanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-dodecanoic acid	1000	0.50	---	---	1	10	0.05000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ90**

Description: PFAS DoD ICAL L9

Perfluoro-n-heptanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-hexadecanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-hexanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-octadecanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-octanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluorononanoic Acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-pentanoic acid	1000	0.51	---	---	1	10	0.05050
Perfluoro-n-tetradecanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-tridecanoic acid	1000	0.50	---	---	1	10	0.05000
Perfluoro-n-undecanoic acid	1000	0.50	---	---	1	10	0.05000

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.05000
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.05050
1H,1H,2H,2H-perfluorododecane sulfonate	.04830

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ90**

Description: PFAS DoD ICAL L9

1H,1H,2H,2H-Perfluorohexane sulfonate	.05000
1H,1H,2H,2H-Perfluorooctane sulfonate	.05000
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.05000
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.05000
3-Perfluoroheptyl propanoic acid	.05000
3-Perfluoropentyl propanoic acid	.05000
3-perfluoropropyl propanoic Acid	.05000
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.05000
Adona	.05000
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.05000
N-ethylperfluoro-1-octanesulfonamide	.05000
N-ethylperfluoro-octanesulfonamidoacetic acid	.05000
N-methylperfluoro-1-octanesulfonamide	.05000
N-methylperfluoro-1-octanesulfonamidoacetic acid	.05000
nonafluoro-3,6-dioxaheptanoic acid	.05000
Perfluoro (2-ethoxyethane) sulfonic acid	.04460
Perfluoro-1-butanesulfonate	.05000
Perfluoro-1-decanesulfonate	.05050
Perfluoro-1-dodecanesulfonate	.04850
Perfluoro-1-heptanesulfonate	.05000
Perfluoro-1-hexanesulfonate	.05000
Perfluoro-1-nonanesulfonate	.05050
Perfluoro-1-octanesulfonamide	.05000
Perfluoro-1-octanesulfonate	.05000
perfluoro-1-pentanesulfonate	.05000
Perfluoro-3-methoxypropanoic acid	.05000
Perfluoro-4-methoxybutanoic acid	.05000
Perfluoro-n-butanoic Acid	.05000
Perfluoro-n-decanoic Acid	.05000
Perfluoro-n-dodecanoic acid	.05000
Perfluoro-n-heptanoic Acid	.05000
Perfluoro-n-hexadecanoic acid	.05000
Perfluoro-n-hexanoic acid	.05000

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ90**

Description: PFAS DoD ICAL L9

Perfluoro-n-octadecanoic acid	.05000
Perfluoro-n-octanoic Acid	.05000
Perfluorononanoic Acid	.05000
Perfluoro-n-pentanoic acid	.05050
Perfluoro-n-tetradecanoic acid	.05000
Perfluoro-n-tridecanoic acid	.05000
Perfluoro-n-undecanoic acid	.05000

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	C202360925
LX92	Pipette	C202360925
LZ07	Pipette	C202360925
LZ39	Pipette	C202360925
LZ79	Pipette	B820865811

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ91

Description: PFAS DoD Instrument Blank

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	100	0.50	---	---	1	10	0.00500
d3-MeFOSA	100	0.50	---	---	1	10	0.00500
d5-EtFOSA	100	0.50	---	---	1	10	0.00500
d7-MeFOSE	100	0.50	---	---	1	10	0.00500
d9-EtFOSE	100	0.50	---	---	1	10	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	100	0.50	---	---	1	10	0.00500
13C2-PFTeDA	100	0.50	---	---	1	10	0.00500
13C3-HFPO-DA	100	0.50	---	---	1	10	0.00500
13C3-PFBS	100	0.47	---	---	1	10	0.00466
13C3-PFHxS	100	0.47	---	---	1	10	0.00474
13C4-PFHpA	100	0.50	---	---	1	10	0.00500
13C5-PFHxA	100	0.50	---	---	1	10	0.00500
13C6-PFDA	100	0.50	---	---	1	10	0.00500
13C7-PFUnA	100	0.50	---	---	1	10	0.00500
13C8-PFOA	100	0.50	---	---	1	10	0.00500
13C8-PFOS	100	0.48	---	---	1	10	0.00479
13C9-PFNA	100	0.50	---	---	1	10	0.00500
d3-MeFOSAA	100	0.50	---	---	1	10	0.00500
d5-EtFOSAA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	100	0.50	---	---	1	10	0.00500
13C2-PFOA	100	0.50	---	---	1	10	0.00500
13C3-PFBA	100	0.50	---	---	1	10	0.00500
13C4-PFOS	100	0.48	---	---	1	10	0.00479

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	100	0.47	---	---	1	10	0.00469
13C2-6:2FTS	100	0.48	---	---	1	10	0.00476
13C2-8:2FTS	100	0.48	---	---	1	10	0.00480

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ91

Description: PFAS DoD Instrument Blank

13C4-PFBA	100	0.50	---	---	1	10	0.00500
13C5-PFPeA	100	0.50	---	---	1	10	0.00500
13C8-FOSA	100	0.50	---	---	1	10	0.00500

Final Concentrations:

Analyte:	Conc (ug/mL):
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	C202360925

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ91**

Description: PFAS DoD Instrument Blank

LX92	Pipette	C202360925
LZ07	Pipette	C202360925
LZ39	Pipette	C202360925

Solution Prepared By:	Harnden, Kelsey	**Date Prepared:**	8/9/2023	**Expiration Date:**	3/14/2024
Solution Volume :	15 **mL X** 1 **Vials**	**Refrigerator/Freezer No:**	LC Laboratory #2: Refrigerator - R0121		

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ92

Description: PFAS DoD ICC

Stock Id: LW18

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFHxDA	100	0.50	---	---	1	10	0.00500
d3-MeFOSA	100	0.50	---	---	1	10	0.00500
d5-EtFOSA	100	0.50	---	---	1	10	0.00500
d7-MeFOSE	100	0.50	---	---	1	10	0.00500
d9-EtFOSE	100	0.50	---	---	1	10	0.00500

Stock Id: LX92

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDoA	100	0.50	---	---	1	10	0.00500
13C2-PFTeDA	100	0.50	---	---	1	10	0.00500
13C3-HFPO-DA	100	0.50	---	---	1	10	0.00500
13C3-PFBS	100	0.47	---	---	1	10	0.00466
13C3-PFHxS	100	0.47	---	---	1	10	0.00474
13C4-PFHpA	100	0.50	---	---	1	10	0.00500
13C5-PFHxA	100	0.50	---	---	1	10	0.00500
13C6-PFDA	100	0.50	---	---	1	10	0.00500
13C7-PFUnA	100	0.50	---	---	1	10	0.00500
13C8-PFOA	100	0.50	---	---	1	10	0.00500
13C8-PFOS	100	0.48	---	---	1	10	0.00479
13C9-PFNA	100	0.50	---	---	1	10	0.00500
d3-MeFOSAA	100	0.50	---	---	1	10	0.00500
d5-EtFOSAA	100	0.50	---	---	1	10	0.00500

Stock Id: LZ07

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-PFDA	100	0.50	---	---	1	10	0.00500
13C2-PFOA	100	0.50	---	---	1	10	0.00500
13C3-PFBA	100	0.50	---	---	1	10	0.00500
13C4-PFOS	100	0.48	---	---	1	10	0.00479

Stock Id: LZ32

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic aci	125	0.20	---	---	1	10	0.00250
1H,1H,2H,2H-Perfluorodecane sulfonate	125	0.20	---	---	1	10	0.00253
1H,1H,2H,2H-perfluorododecane sulfonate	125	0.19	---	---	1	10	0.00242

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ92**

Description: PFAS DoD ICC

1H,1H,2H,2H-Perfluorohexane sulfonate	125	0.20	---	---	1	10	0.00250
1H,1H,2H,2H-Perfluorooctane sulfonate	125	0.20	---	---	1	10	0.00250
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	125	0.20	---	---	1	10	0.00250
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	125	0.20	---	---	1	10	0.00250
3-Perfluoroheptyl propanoic acid	125	0.20	---	---	1	10	0.00250
3-Perfluoropentyl propanoic acid	125	0.20	---	---	1	10	0.00250
3-perfluoropropyl propanoic Acid	125	0.20	---	---	1	10	0.00250
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic aci	125	0.20	---	---	1	10	0.00250
Adona	125	0.20	---	---	1	10	0.00250
Hexafluoropropylene oxide dimer acid	125	0.20	---	---	1	10	0.00250
N-ethylperfluoro-1-octanesulfonamide	125	0.20	---	---	1	10	0.00250
N-ethylperfluoro-octanesulfonamidoacetic acid	125	0.20	---	---	1	10	0.00250
N-methylperfluoro-1-octanesulfonamide	125	0.20	---	---	1	10	0.00250
N-methylperfluoro-1-octanesulfonamidoacetic acid	125	0.20	---	---	1	10	0.00250
nonafluoro-3,6-dioxaheptanoic acid	125	0.20	---	---	1	10	0.00250
Perfluoro (2-ethoxyethane) sulfonic acid	125	0.18	---	---	1	10	0.00223
Perfluoro-1-butanesulfonate	125	0.20	---	---	1	10	0.00250
Perfluoro-1-decanesulfonate	125	0.20	---	---	1	10	0.00253
Perfluoro-1-dodecanesulfonate	125	0.19	---	---	1	10	0.00243
Perfluoro-1-heptanesulfonate	125	0.20	---	---	1	10	0.00250
Perfluoro-1-hexanesulfonate	125	0.20	---	---	1	10	0.00250
Perfluoro-1-nonanesulfonate	125	0.20	---	---	1	10	0.00253
Perfluoro-1-octanesulfonamide	125	0.20	---	---	1	10	0.00250
Perfluoro-1-octanesulfonate	125	0.20	---	---	1	10	0.00250
perfluoro-1-pentanesulfonate	125	0.20	---	---	1	10	0.00250
Perfluoro-3-methoxypropanoic acid	125	0.20	---	---	1	10	0.00250
Perfluoro-4-methoxybutanoic acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-butanoic Acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-decanoic Acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-dodecanoic acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-heptanoic Acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-hexadecanoic acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-hexanoic acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-octadecanoic acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-octanoic Acid	125	0.20	---	---	1	10	0.00250
Perfluorononanoic Acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-pentanoic acid	125	0.20	---	---	1	10	0.00253
Perfluoro-n-tetradecanoic acid	125	0.20	---	---	1	10	0.00250
Perfluoro-n-tridecanoic acid	125	0.20	---	---	1	10	0.00250

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: LZ92

Description: PFAS DoD ICC

Perfluoro-n-undecanoic acid	125	0.20	---	---	1	10	0.00250

Stock Id: LZ39

Chemical Name	Stock Amount uL	Initial Conc. (ug/mL)	Density (g/mL)	Purity	Conv. Factor	Final Vol mL	Concentration (ug/mL)
13C2-4:2FTS	100	0.47	---	---	1	10	0.00469
13C2-6:2FTS	100	0.48	---	---	1	10	0.00476
13C2-8:2FTS	100	0.48	---	---	1	10	0.00480
13C4-PFBA	100	0.50	---	---	1	10	0.00500
13C5-PFPeA	100	0.50	---	---	1	10	0.00500
13C8-FOSA	100	0.50	---	---	1	10	0.00500

Final Concentrations:

Analyte:	Conc (ug/mL):
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	.00250
13C2-4:2FTS	.00469
13C2-6:2FTS	.00476
13C2-8:2FTS	.00480
13C2-PFDA	.00500
13C2-PFDoA	.00500
13C2-PFHxDA	.00500
13C2-PFOA	.00500
13C2-PFTeDA	.00500
13C3-HFPO-DA	.00500
13C3-PFBA	.00500
13C3-PFBS	.00466
13C3-PFHxS	.00474
13C4-PFBA	.00500
13C4-PFHpA	.00500
13C4-PFOS	.00479
13C5-PFHxA	.00500
13C5-PFPeA	.00500
13C6-PFDA	.00500
13C7-PFUnA	.00500
13C8-FOSA	.00500
13C8-PFOA	.00500
13C8-PFOS	.00479
13C9-PFNA	.00500
1H,1H,2H,2H-Perfluorodecane sulfonate	.00253
1H,1H,2H,2H-perfluorododecane sulfonate	.00242

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ92**

Description: PFAS DoD ICC

1H,1H,2H,2H-Perfluorohexane sulfonate	.00250
1H,1H,2H,2H-Perfluorooctane sulfonate	.00250
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	.00250
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	.00250
3-Perfluoroheptyl propanoic acid	.00250
3-Perfluoropentyl propanoic acid	.00250
3-perfluoropropyl propanoic Acid	.00250
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	.00250
Adona	.00250
d3-MeFOSA	.00500
d3-MeFOSAA	.00500
d5-EtFOSA	.00500
d5-EtFOSAA	.00500
d7-MeFOSE	.00500
d9-EtFOSE	.00500
Hexafluoropropylene oxide dimer acid	.00250
N-ethylperfluoro-1-octanesulfonamide	.00250
N-ethylperfluoro-octanesulfonamidoacetic acid	.00250
N-methylperfluoro-1-octanesulfonamide	.00250
N-methylperfluoro-1-octanesulfonamidoacetic acid	.00250
nonafluoro-3,6-dioxaheptanoic acid	.00250
Perfluoro (2-ethoxyethane) sulfonic acid	.00223
Perfluoro-1-butanesulfonate	.00250
Perfluoro-1-decanesulfonate	.00253
Perfluoro-1-dodecanesulfonate	.00243
Perfluoro-1-heptanesulfonate	.00250
Perfluoro-1-hexanesulfonate	.00250
Perfluoro-1-nonanesulfonate	.00253
Perfluoro-1-octanesulfonamide	.00250
Perfluoro-1-octanesulfonate	.00250
perfluoro-1-pentanesulfonate	.00250
Perfluoro-3-methoxypropanoic acid	.00250
Perfluoro-4-methoxybutanoic acid	.00250
Perfluoro-n-butanoic Acid	.00250
Perfluoro-n-decanoic Acid	.00250
Perfluoro-n-dodecanoic acid	.00250
Perfluoro-n-heptanoic Acid	.00250
Perfluoro-n-hexadecanoic acid	.00250
Perfluoro-n-hexanoic acid	.00250

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

Standard Solution Concentrations

Approved: ☑

Standard Laboratory ID Number: **LZ92**

Description: PFAS DoD ICC

Perfluoro-n-octadecanoic acid	.00250
Perfluoro-n-octanoic Acid	.00250
Perfluorononanoic Acid	.00250
Perfluoro-n-pentanoic acid	.00253
Perfluoro-n-tetradecanoic acid	.00250
Perfluoro-n-tridecanoic acid	.00250
Perfluoro-n-undecanoic acid	.00250

Syringes/Pipettes:

Stock ID:	Type:	Battelle ID:
LW18	Pipette	C202360925
LX92	Pipette	C202360925
LZ07	Pipette	C202360925
LZ32	Pipette	B814657482
LZ39	Pipette	C202360925

Solution Prepared By: Harnden, Kelsey **Date Prepared:** 8/9/2023 **Expiration Date:** 3/14/2024

Solution Volume : 15 **mL X** 1 **Vials** **Refrigerator/Freezer No:** LC Laboratory #2: Refrigerator - R0121

Comment: 4% Water, 1% NH3OH, 0.625% Acetic Acid in Methanol

Approved By: Schumitz, Denise **Date:** 8/16/2023 10:47:00 AM

BATTELLE
It can be done

BDO Id: 220124-04

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name:	M2PFHxA	**Received:**	1/24/2022
Vendor:	Wellington Laboratories	**Custodian:**	Thorn, Jonathan
Catalogue No:	M2PFHxA	**Expires:**	11/23/2026
Type:	Solution	**Consumed:**	
Lot No:	M2PFHxA1121	**Stored In:**	VOC Laboratory - R0123
Quantity:	1 ea Unit	**% Moisture:**	0
Description:	M2PFHxA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C2-PFHxDA	BDO-2430	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFHxDA
COMPOUND: Perfluoro-n-(1,2-$^{13}C_2$)hexadecanoic acid

LOT NUMBER: M2PFHxDA1121

STRUCTURE:

CAS #: Not available

MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{14}HF_{31}O_2$	**MOLECULAR WEIGHT:**	816.11
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/23/2021		
EXPIRY DATE: (mm/dd/yyyy)	11/23/2026		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~0.5% of native perfluoro-n-hexadecanoic acid (PFHxDA) and ~0.4% of perfluoro-n-($^{13}C_1$)pentadecanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/10/2021 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE

It can be done

BDO Id: 220728-19

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name:	13C2-PFDA	**Received:**	7/28/2022
Vendor:	Wellington Laboratories	**Custodian:**	Harnden, Kelsey
Catalogue No:	MPFDA	**Expires:**	12/8/2026
Type:	Solution	**Consumed:**	
Lot No:	MPFDA1221	**Stored In:**	VOC Laboratory - R0121
Quantity:	1 ea Ampoule **% Moisture:**		
Description:	MPFDA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C2-PFDA	BDO-2110	50.0000	98.00	--	--	☐			
13C6-PFDA	BDO-2222	--		--	--	☐			

Total Analytes: 2

Notes:

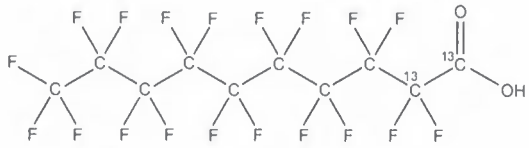
Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA1221
COMPOUND:	Perfluoro-n-(1,2-$^{13}C_2$)decanoic acid		
STRUCTURE:		**CAS #:**	960315-50-8



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	12/08/2021		
EXPIRY DATE: (mm/dd/yyyy)	12/08/2026		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/13/2021 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE

It can be done

BDO Id: 221103-02

ea ent eceipt eport

Approved: ☐ **Aut ori ed** ☐

Name: Method 537.1 Analyte Primary Dultio

Vendor: Cambridge Isotope Laborat

Catalogue No: ES-5631

Type: Solution

Lot No: PR-32174

Quantity: 16 ea ampoules **% Moisture:**

Description: Method 537.1 Analyte Primary Dultion STD

Received: 11/3/2022

Custodian: Beal, Hayley

Expires: 12/7/2026

Consumed:

Stored In: Sample Preparation - C0103

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
11-chloroeicosafluoro-3-oxaundecan	763051-92-9	2.0000	100.00	--	--	☐			
9-chlorohexadecafluoro-3-oxanonane	756426-58-1	2.0000	100.00	--	--	☐			
Adona	919005-14-4	2.0000	100.00	--	--	☐			
Hexafluoropropylene oxide dimer aci	13252-13-6	2.0000	100.00	--	--	☐			
N-ethylperfluoro-octanesulfonamidoa	2991-50-6	2.0000	100.00	--	--	☐			
N-methylperfluoro-1-octanesulfonami	2355-31-9	2.0000	100.00	--	--	☐			
Perfluoro-1-butanesulfonate	375-73-5	2.0000	100.00	--	--	☐			
Perfluoro-1-hexanesulfonate	355-46-4	2.0000	100.00	--	--	☐			
Perfluoro-1-octanesulfonate	1763-23-1	2.0000	100.00	--	--	☐			
Perfluoro-n-decanoic Acid	335-76-2	2.0000	100.00	--	--	☐			
Perfluoro-n-dodecanoic acid	307-55-1	2.0000	100.00	--	--	☐			
Perfluoro-n-heptanoic Acid	375-85-9	2.0000	100.00	--	--	☐			
Perfluoro-n-hexanoic acid	307-24-4	2.0000	100.00	--	--	☐			
Perfluoro-n-octanoic Acid	335-67-1	2.0000	100.00	--	--	☐			
Perfluorononanoic Acid	375-95-1	2.0000	100.00	--	--	☐			
Perfluoro-n-tetradecanoic acid	376-06-7	2.0000	100.00	--	--	☐			
Perfluoro-n-tridecanoic acid	72629-94-8	2.0000	100.00	--	--	☐			
Perfluoro-n-undecanoic acid	2058-94-8	2.0000	100.00	--	--	☐			

Total Analytes: 18

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

221163-02

Product Description: Method 537.1 Analyte Primary Dilution STD (PDS)
Catalog Number: ES-5631
Lot Number: PR-32714
Solvent: Methanol (w/ 4Molar Equivalents NaOH)
Volume per Ampoule: 1.2 mL
Storage Conditions: Store at room temperature away from light and moisture.
Intended Use: For Research Use Only. Not for use in diagnostic procedures.
QC Release Date: December 7, 2021
Expiration Date: December 7, 2026

Component	Acronym	Target Concentration (ng/mL)	Gravimetric Concentration of Salt ± Uncertainty, (k=2) (ng/mL)	Gravimetric Concentration of Free Acid ± Uncertainty (k=2) (ng/mL)
Perfluorohexanoic acid, sodium salt	PFHxA	2,000	2,140 ± 2	2,000 ± 2
Perfluoroheptanoic acid	PFHpA	2,000	-	2,000 ± 20
Perfluorooctanoic acid	PFOA	2,000	-	2,000 ± 21
Perfluorononanoic acid	PFNA	2,000	-	2,000 ± 20
Perfluorodecanoic acid, sodium salt	PFDA	2,000	2,086 ± 21	2,000 ± 21
Perfluoroundecanoic acid, sodium salt	PFUdA	2,000	2,078 ± 22	2,000 ± 22
Perfluorododecanoic acid, sodium salt	PFDoA	2,000	2,072 ± 34	2,000 ± 34
Perfluorotridecanoic acid	PFTrDA	2,000	-	2,000 ± 32
Perfluorotetradecanoic acid	PFTeDA	2,000	-	2,000 ± 21
Perfluorobutanesulfonate, potassium salt	PFBS	2,000	2,254 ± 23	2,000 ± 23
Potassium perfluorohexanesulfonate (mixed isomers)	PFHxS	2,000	2,190 ± 23	2,000 ± 23
Perfluorooctanesulfonate (mixed isomers)	PFOS	2,000	-	2,000 ± 20
N-Ethylperfluorooctanesulfonamidoacetic acid (mixed isomers)	N-EtFOSAA	2,000	-	2,000 ± 100
N-Methylperfluorooctanesulfonamidoacetic acid (mixed isomers)	N-MeFOSAA	2,000	-	2,000 ± 100
Tetrafluoro-2-(heptafluoropropoxy)propanoic acid "GENX"	HFPO-DA	2,000	-	2,000 ± 20
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid, potassium salt	11CL-PF3OUDS	2,000	2,120 ± 21	2,000 ± 21
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid, potassium salt	9CL-PF3ONS	2,000	2,143 ± 26	2,000 ± 26
Dodecafluoro-3H-4,8-dioxanonanoic acid, sodium salt	NaDONA	2,000	2,116 ± 106	2,000 ± 106

Notes:

- Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

BATTELLE
It can be done

BDO Id: 230113-01

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: PFOA-DoD
Vendor: ABSOLUTE STANDARDS
Catalogue No: 64029
Type: Solution
Lot No: 110922
Quantity: 10 ea ampoules **% Moisture:**
Description: PFOA-DoD

Received: 1/13/2023
Custodian: Beal, Hayley
Expires: 11/9/2027
Consumed:
Stored In: LC Laboratory - F0111

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
11-chloroeicosafluoro-3-oxaundecan	763051-92-9	1.0000	100.00	--	--	☐			
1H,1H,2H,2H-Perfluorodecane sulfo	39108-34-4	1.0100	100.00	--	--	☐			
1H,1H,2H,2H-Perfluorohexane sulfon	757124-72-4	1.0000	100.00	--	--	☐			
1H,1H,2H,2H-Perfluorooctane sulfon	27619-97-2	1.0000	100.00	--	--	☐			
9-chlorohexadecafluoro-3-oxanonane	756426-58-1	1.0000	100.00	--	--	☐			
Adona	919005-14-4	1.0000	100.00	--	--	☐			
Hexafluoropropylene oxide dimer aci	13252-13-6	1.0000	100.00	--	--	☐			
N-ethylperfluoro-octanesulfonamidoa	2991-50-6	1.0000	100.00	--	--	☐			
N-methylperfluoro-1-octanesulfonami	2355-31-9	1.0000	100.00	--	--	☐			
Perfluoro-1-butanesulfonate	375-73-5	1.0000	100.00	--	--	☐			
Perfluoro-1-decanesulfonate	335-77-3	1.0100	100.00	--	--	☐			
Perfluoro-1-heptanesulfonate	375-92-8	1.0000	100.00	--	--	☐			
Perfluoro-1-hexanesulfonate	355-46-4	1.0000	100.00	--	--	☐			
Perfluoro-1-nonanesulfonate	68259-12-1	1.0100	100.00	--	--	☐			
Perfluoro-1-octanesulfonamide	754-91-6	1.0000	100.00	--	--	☐			
Perfluoro-1-octanesulfonate	1763-23-1	1.0000	100.00	--	--	☐			
perfluoro-1-pentanesulfonate	2706-91-4	1.0000	100.00	--	--	☐			
Perfluoro-n-butanoic Acid	375-22-4	1.0000	100.00	--	--	☐			
Perfluoro-n-decanoic Acid	335-76-2	1.0000	100.00	--	--	☐			
Perfluoro-n-dodecanoic acid	307-55-1	1.0000	100.00	--	--	☐			
Perfluoro-n-heptanoic Acid	375-85-9	1.0000	100.00	--	--	☐			
Perfluoro-n-hexanoic acid	307-24-4	1.0000	100.00	--	--	☐			
Perfluoro-n-octanoic Acid	335-67-1	1.0000	100.00	--	--	☐			
Perfluorononanoic Acid	375-95-1	1.0000	100.00	--	--	☐			
Perfluoro-n-pentanoic acid	2706-90-3	1.0100	100.00	--	--	☐			
Perfluoro-n-tetradecanoic acid	376-06-7	1.0000	100.00	--	--	☐			
Perfluoro-n-tridecanoic acid	72629-94-8	1.0000	100.00	--	--	☐			
Perfluoro-n-undecanoic acid	2058-94-8	1.0000	100.00	--	--	☐			

Total Analytes: 28

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230113-01

CERTIFIED WEIGHT REPORT

Part Number:	64029				
Lot Number:	110922	**Solvent(s):**	**Lot#**		
Description:	PFOA - DOD	Methanol (1 mM KOH)	102722	(98%)	
	28 components	2-Propanol	32500	(2%)	
Expiration Date:	110927				
Recommended Storage:	Freezer (0 °C)				
Nominal Concentration (µg/mL):	1.0				
NIST Test ID#:	6UTB	5E-05	Balance Uncertainty		
Volume(s) shown below were combined and diluted to (mL):		100.0	0.012	Flask Uncertainty	

Formulated By: Prashant Chauhan — 110922 DATE

Reviewed By: Pedro L. Rentas — 110922 DATE

Note: All assigned values are anion concentrations.

	Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Initial Conc.(µg/mL)	Final Conc.(µg/mL)	Expanded Uncertainty (+/-) µg/mL	SDS Information (Solvent Safety Info. On Attached pg.) Free Acid CAS#	OSHA PEL (TWA)	LD50
1.	Perfluoro-n-butanoic acid (PFBA)	99542	110922	0.02	2.00	0.017	50.1	1.00	0.02	375-22-4	N/A	N/A
2.	Perfluoro-n-pentanoic acid (PFPeA)	99543	050222	0.02	2.00	0.017	50.3	1.01	0.02	2706-90-3	N/A	N/A
3.	Perfluorohexanoic acid (PFHxA)	99199	071122	0.02	2.00	0.017	50.2	1.00	0.02	307-24-4	N/A	N/A
4.	Perfluoroheptanoic acid (PFHpA)	99197	110922	0.02	2.00	0.017	50.1	1.00	0.02	375-85-9	N/A	N/A
5.	Perfluorooctanoic acid (br-PFOA)*	99202	080522	0.02	2.00	0.017	50.2	1.00	0.02	335-67-1 (L)	N/A	ipr-rat 189mg/kg
6.	Perfluorononanoic acid (PFNA)	99200	110922	0.02	2.00	0.017	50.1	1.00	0.02	375-95-1	N/A	N/A
7.	Perfluorodecanoic acid (PFDA)	99195	110922	0.02	2.00	0.017	50.0	1.00	0.02	335-76-2	N/A	orl-rat 57mg/kg
8.	Perfluoroundecanoic acid (PFUnA)	99205	071522	0.02	2.00	0.017	50.2	1.00	0.02	2058-94-8	N/A	N/A
9.	Perfluorododecanoic acid (PFDoA)	99196	071522	0.02	2.00	0.017	50.1	1.00	0.02	307-55-1	N/A	N/A
10.	Perfluorotridecanoic acid (PFTrDA)	99204	110922	0.02	2.00	0.017	50.1	1.00	0.02	72629-94-8	N/A	N/A
11.	Perfluorotetradecanoic acid (PFTeDA)	99203	033022	0.02	2.00	0.017	50.1	1.00	0.02	376-06-7	N/A	N/A
12.	Perfluoro-1-octanesulfonamide (FOSA)	3677	FOSA0322I	0.02	2.00	0.017	50.0	1.00	0.05	754-91-6	N/A	N/A
13.	N-Methylperfluorooctanesulfonamidoacetic acid (br-NMeFOSAA)*	4162	brNMeFOSAA0422	0.02	2.00	0.017	50.0	1.00	0.05	2355-31-9 (L)	N/A	N/A
14.	N-Ethylperfluorooctanesulfonamidoacetic acid (br-NEtFOSAA)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	50.0	1.00	0.05	2991-50-6 (L)	N/A	N/A
15.	Perfluorobutanesulfonic acid (PFBS)	99194	080522	0.02	2.00	0.017	50.2	1.00	0.02	375-73-5	N/A	N/A
16.	Perfluoro-1-pentanesulfonic acid (PFPeS)	99544	032422	0.02	2.00	0.017	50.1	1.00	0.02	2706-91-4	N/A	N/A
17.	Perfluorohexanesulfonic acid (br-PFHxS)*	99198	071522	0.02	2.00	0.017	50.2	1.00	0.02	355-46-4 (L)	N/A	N/A
18.	Perfluoro-1-heptanesulfonic acid (PFHpS)	3672	LPFHpS0822	0.021	2.10	0.017	47.6	1.00	0.05	375-92-6	N/A	N/A
19.	Heptadecafluorooctanesulfonic acid (br-PFOS)*	99201	033022	0.02	2.00	0.017	50.1	1.00	0.02	1763-23-1 (L)	N/A	N/A
20.	Perfluoro-1-nonanesulfonic acid (PFNS)	3957	LPFNS1021	0.021	2.10	0.017	48.0	1.01	0.05	68259-12-1	N/A	N/A
21.	Perfluoro-1-decanesulfonic acid (PFDS)	3871	LPFDS0222	0.021	2.10	0.017	48.2	1.01	0.05	335-77-3	N/A	N/A
22.	1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	65271	080522	0.02	2.00	0.017	50.2	1.00	0.05	757124-72-4	N/A	N/A
23.	1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	65272	071522	0.02	2.00	0.017	50.2	1.00	0.05	27619-97-2	N/A	N/A
24.	1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	3662	62FTS0822	0.021	2.10	0.017	47.9	1.01	0.05	39108-34-4	N/A	N/A
25.	2-(Heptafluoropropoxy)-2,3,3,3-tetrafluoropropionic acid (HFPO-DA)	99666	080522	0.02	2.00	0.017	50.1	1.00	0.02	13252-13-6	N/A	N/A
26.	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	4165	11ClPF3OUdS0522	0.021	2.12	0.017	47.1	1.00	0.05	763051-92-9	N/A	N/A
27.	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	4164	9ClPF3ONS0522	0.021	2.14	0.017	46.6	1.00	0.05	756426-58-1	N/A	N/A
28.	Dodecafluoro-3H-4,8-dioxanonanoic acid (ADONA)	4103	NaDONA0922	0.021	2.12	0.017	47.1	1.00	0.05	919005-14-4	N/A	N/A
	Perfluorooctanoic acid (linear)*	99202	080522	0.02	2.00	0.004	49.6	0.99	0.010	335-67-1 (L)	N/A	ipr-rat 189mg/kg
	Perfluorooctanoic acid (branched isomer)*	99202	080522	0.02	2.00	0.004	0.6	0.01	0.001	335-67-1 (L)	N/A	ipr-rat 189mg/kg
	Perfluorohexanesulfonic acid (linear)*	99198	071522	0.02	2.00	0.017	44.2	0.88	0.02	355-46-4 (L)	N/A	N/A
	Perfluorohexanesulfonic acid (branched isomer)*	99198	071522	0.02	2.00	0.017	6.0	0.12	0.0021	355-46-4 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (linear)*	99201	033022	0.02	2.00	0.017	38.1	0.76	0.02	1763-23-1 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	7.5	0.15	0.003	1763-23-1 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	4.0	0.08	0.002	1763-23-1 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	0.5	0.010	0.0002	1763-23-1 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (linear)*	4162	brNMeFOSAA0422	0.02	2.00	0.017	36.0	0.72	0.04	2355-31-9 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0422	0.02	2.00	0.017	6.5	0.13	0.011	2355-31-9 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0422	0.02	2.00	0.017	5.0	0.10	0.005	2355-31-9 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0422	0.02	2.00	0.017	2.5	0.05	0.0009	2355-31-9 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (linear)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	38.6	0.73	0.04	2991-50-6 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	7.7	0.15	0.009	2991-50-6 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	5.3	0.11	0.005	2991-50-6 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	0.4	0.007	0.0008	2991-50-6 (L)	N/A	N/A

*Concentrations for branched and linear isomers are based on LCMS chromatographic analysis only.

A qualitative standard (Sect. 3.19) is available for PFOA that contains the linear and branched isomers (Wellington Labs, Cat. No. T-PFOA, or equivalent). This qualitative PFOA standard must be purchased and used to identify the retention times of the branched PFOA isomers, but the linear only PFOA standard must be used for quantitation (Sect. 12.2) until a quantitative PFOA standard containing the branched and linear isomers becomes commercially available.1

- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.
- Uncertainty Reference: Taylor, B.N. and Kuyal, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC, (1994).

Absolute Standards, Inc.
800-368-1131
www.absolutestandards.com

Certified Reference Material CRM

230113-02

ANAB ISO 17034 Accredited
AR-1539 Certificate Number
https://Absolutestandards.com

CERTIFIED WEIGHT REPORT

Part Number:	64029				
Lot Number:	080522	**Solvent(s):**	**Lot#**		
Description:	PFOA - DOD	Methanol (1 mM KOH)	042722	(98%)	
	28 components	2-Propanol	23214	(2%)	
Expiration Date:	080527				
Recommended Storage:	Freezer (0 °C)				
Nominal Concentration (µg/mL):	1.0				
NIST Test ID#:	6UTB	5E-05	Balance Uncertainty		
Volume(s) shown below were combined and diluted to (mL):		100.0	0.012	Flask Uncertainty	

Formulated By: Prashant Chauhan 080522 DATE

Reviewed By: Pedro L. Rentas 080522 DATE

Note: All assigned values are anion concentrations.

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Initial Conc.(µg/mL)	Final Conc.(µg/mL)	Expanded Uncertainty (+/-) µg/mL	SDS Information (Solvent Safety Info. On Attached pg.) Free Acid CAS#	OSHA PEL (TWA)	LD50
1. Perfluoro-n-butanoic acid (PFBA)	99542	021022	0.02	2.00	0.017	50.1	1.00	0.02	375-22-4	N/A	N/A
2. Perfluoro-n-pentanoic acid (PFPeA)	99543	050222	0.02	2.00	0.017	50.3	1.01	0.02	2706-90-3	N/A	N/A
3. Perfluorohexanoic acid (PFHxA)	99199	071122	0.02	2.00	0.017	50.2	1.00	0.02	307-24-4	N/A	N/A
4. Perfluoroheptanoic acid (PFHpA)	99197	040522	0.02	2.00	0.017	50.1	1.00	0.02	375-85-9	N/A	N/A
5. Perfluorooctanoic acid (br-PFOA)*	99202	080522	0.02	2.00	0.017	50.2	1.00	0.02	335-67-1 (L)	N/A	ipr-rat 189mg/kg
6. Perfluorononanoic acid (PFNA)	99200	050222	0.02	2.00	0.017	50.1	1.00	0.02	375-95-1	N/A	N/A
7. Perfluorodecanoic acid (PFDA)	99195	041822	0.02	2.00	0.017	50.0	1.00	0.02	335-76-2	N/A	orl-rat 57mg/kg
8. Perfluoroundecanoic acid (PFUnA)	99205	071522	0.02	2.00	0.017	50.2	1.00	0.02	2058-94-8	N/A	N/A
9. Perfluorododecanoic acid (PFDoA)	99196	071522	0.02	2.00	0.017	50.1	1.00	0.02	307-55-1	N/A	N/A
10. Perfluorotridecanoic acid (PFTrDA)	99204	021022	0.02	2.00	0.017	50.1	1.00	0.02	72629-94-8	N/A	N/A
11. Perfluorotetradecanoic acid (PFTeDA)	99203	033022	0.02	2.00	0.017	50.1	1.00	0.02	376-06-7	N/A	N/A
12. Perfluoro-1-octanesulfonamide (FOSA)	3677	FOSA0322I	0.02	2.00	0.017	50.0	1.00	0.05	754-91-6	N/A	N/A
13. N-Methylperfluorooctanesulfonamidoacetic acid (br-NMeFOSAA)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	50.0	1.00	0.05	2355-31-9 (L)	N/A	N/A
14. N-Ethylperfluorooctanesulfonamidoacetic acid (br-NEtFOSAA)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	50.0	1.00	0.05	2991-50-6 (L)	N/A	N/A
15. Perfluorobutanesulfonic acid (PFBS)	99194	080522	0.02	2.00	0.017	50.2	1.00	0.02	375-73-5	N/A	N/A
16. Perfluoro-1-pentanesulfonic acid (PFPeS)	99544	032422	0.02	2.00	0.017	50.1	1.00	0.02	2706-91-4	N/A	N/A
17. Perfluorohexanesulfonic acid (br-PFHxS)*	99198	071522	0.02	2.00	0.017	50.2	1.00	0.02	355-46-4 (L)	N/A	N/A
18. Perfluoro-1-heptanesulfonic acid (PFHpS)	3672	LPFHpS0122	0.021	2.10	0.017	47.6	1.00	0.05	375-92-8	N/A	N/A
19. Heptadecafluorooctanesulfonic acid (br-PFOS)*	99201	033022	0.02	2.00	0.017	50.1	1.00	0.02	1763-23-1 (L)	N/A	N/A
20. Perfluoro-1-nonanesulfonic acid (PFNS)	3957	LPFNS0422	0.021	2.10	0.017	48.0	1.01	0.05	68259-12-1	N/A	N/A
21. Perfluoro-1-decanesulfonic acid (PFDS)	3671	LPFDS0222	0.021	2.10	0.017	48.2	1.01	0.05	335-77-3	N/A	N/A
22. 1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	65271	080522	0.02	2.00	0.017	50.2	1.00	0.05	757124-72-4	N/A	N/A
23. 1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	65272	071522	0.02	2.00	0.017	50.2	1.00	0.05	27619-97-2	N/A	N/A
24. 1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	3662	82FTS0122	0.021	2.10	0.017	47.9	1.01	0.05	39108-34-4	N/A	N/A
25. 2-(Heptafluoropropoxy)-2,3,3,3-tetrafluoropropionic acid (HFPO-DA)	99668	080522	0.02	2.00	0.017	50.1	1.00	0.02	13252-13-6	N/A	N/A
26. 11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	4165	11ClPF3OUdS0222	0.021	2.12	0.017	47.1	1.00	0.05	763051-92-9	N/A	N/A
27. 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	4164	9ClPF3ONS0522	0.021	2.14	0.017	48.6	1.00	0.05	756426-58-1	N/A	N/A
28. Dodecafluoro-3H-4,8-dioxanonanoic acid (ADONA)	4103	NaDONA0422	0.021	2.12	0.017	47.1	1.00	0.05	919005-14-4	N/A	N/A
Perfluorooctanoic acid (linear)*	99202	080522	0.02	2.00	0.004	49.6	0.99	0.010	335-67-1 (L)	N/A	ipr-rat 189mg/kg
Perfluorooctanoic acid (branched isomer)*	99202	080522	0.02	2.00	0.004	0.6	0.01	0.001	335-67-1 (L)	N/A	ipr-rat 189mg/kg
Perfluorohexanesulfonic acid (linear)*	99198	071522	0.02	2.00	0.017	44.2	0.88	0.02	355-46-4 (L)	N/A	N/A
Perfluorohexanesulfonic acid (branched isomer)*	99198	071522	0.02	2.00	0.017	8.0	0.12	0.0021	355-46-4 (L)	N/A	N/A
Heptadecafluorooctanesulfonic acid (linear)*	99201	033022	0.02	2.00	0.017	38.1	0.76	0.02	1763-23-1 (L)	N/A	N/A
Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	7.5	0.15	0.003	1763-23-1 (L)	N/A	N/A
Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	4.0	0.08	0.002	1763-23-1 (L)	N/A	N/A
Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	0.5	0.010	0.0002	1763-23-1 (L)	N/A	N/A
N-Methylperfluoro-1-octanesulfonamidoacetic acid (linear)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	36.0	0.72	0.04	2355-31-9 (L)	N/A	N/A
N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	6.5	0.13	0.011	2355-31-9 (L)	N/A	N/A
N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	5.0	0.10	0.005	2355-31-9 (L)	N/A	N/A
N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	2.5	0.05	0.0009	2355-31-9 (L)	N/A	N/A
N-Ethylperfluoro-1-octanesulfonamidoacetic acid (linear)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	36.6	0.73	0.04	2991-50-6 (L)	N/A	N/A
N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	7.7	0.15	0.009	2991-50-6 (L)	N/A	N/A
N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	5.3	0.11	0.005	2991-50-6 (L)	N/A	N/A
N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	0.4	0.007	0.0006	2991-50-6 (L)	N/A	N/A

*Concentrations for branched and linear isomers are based on LCMS chromatographic analysis only.

A qualitative standard (Sect. 3.19) is available for PFOA that contains the linear and branched isomers (Wellington Labs, Cat. No. T-PFOA, or equivalent). This qualitative PFOA standard must be purchased and used to identify the retention times of the branched PFOA isomers, but the linear only PFOA standard must be used for quantitation (Sect. 12.2) until a quantitative PFOA standard containing the branched and linear isomers becomes commercially available.1

- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- All Standards, after opening ampoule, should be stored with caps tight and under appropriate laboratory conditions.
- Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result." NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC, (1994).

BATTELLE
It can be done

BDO Id: 230113-02

Reagent Receipt Report

Approved: ☐ **Authorized** ☐

Name: PFOA-DoD
Vendor: ABSOLUTE STANDARDS
Catalogue No: 64029
Type: Solution
Lot No: 080522
Quantity: 10 ea ampoules **% Moisture:**
Description: PFOA-DoD

Received: 1/13/2023
Custodian: Beal, Hayley
Expires: 8/5/2027
Consumed:
Stored In: LC Laboratory #2 - F0111

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
11-chloroeicosafluoro-3-oxaundecan	763051-92-9	1.0000	100.00	--	--	☐			
1H,1H,2H,2H-Perfluorodecane sulfo	39108-34-4	1.0100	100.00	--	--	☐			
1H,1H,2H,2H-Perfluorohexane sulfon	757124-72-4	1.0000	100.00	--	--	☐			
1H,1H,2H,2H-Perfluorooctane sulfon	27619-97-2	1.0000	100.00	--	--	☐			
9-chlorohexadecafluoro-3-oxanonane	756426-58-1	1.0000	100.00	--	--	☐			
Adona	919005-14-4	1.0000	100.00	--	--	☐			
Hexafluoropropylene oxide dimer aci	13252-13-6	1.0000	100.00	--	--	☐			
N-ethylperfluoro-octanesulfonamidoa	2991-50-6	1.0000	100.00	--	--	☐			
N-methylperfluoro-1-octanesulfonami	2355-31-9	1.0000	100.00	--	--	☐			
Perfluoro-1-butanesulfonate	375-73-5	1.0000	100.00	--	--	☐			
Perfluoro-1-decanesulfonate	335-77-3	1.0100	100.00	--	--	☐			
Perfluoro-1-heptanesulfonate	375-92-8	1.0000	100.00	--	--	☐			
Perfluoro-1-hexanesulfonate	355-46-4	1.0000	100.00	--	--	☐			
Perfluoro-1-nonanesulfonate	68259-12-1	1.0100	100.00	--	--	☐			
Perfluoro-1-octanesulfonamide	754-91-6	1.0000	100.00	--	--	☐			
Perfluoro-1-octanesulfonate	1763-23-1	1.0000	100.00	--	--	☐			
perfluoro-1-pentanesulfonate	2706-91-4	1.0000	100.00	--	--	☐			
Perfluoro-n-butanoic Acid	375-22-4	1.0000	100.00	--	--	☐			
Perfluoro-n-decanoic Acid	335-76-2	1.0000	100.00	--	--	☐			
Perfluoro-n-dodecanoic acid	307-55-1	1.0000	100.00	--	--	☐			
Perfluoro-n-heptanoic Acid	375-85-9	1.0000	100.00	--	--	☐			
Perfluoro-n-hexanoic acid	307-24-4	1.0000	100.00	--	--	☐			
Perfluoro-n-octanoic Acid	335-67-1	1.0000	100.00	--	--	☐			
Perfluorononanoic Acid	375-95-1	1.0000	100.00	--	--	☐			
Perfluoro-n-pentanoic acid	2706-90-3	1.0100	100.00	--	--	☐			
Perfluoro-n-tetradecanoic acid	376-06-7	1.0000	100.00	--	--	☐			
Perfluoro-n-tridecanoic acid	72629-94-8	1.0000	100.00	--	--	☐			
Perfluoro-n-undecanoic acid	2058-94-8	1.0000	100.00	--	--	☐			

Total Analytes: 28

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

CERTIFIED WEIGHT REPORT

Part Number:	64029				
Lot Number:	080522	**Solvent(s):**	**Lot#**		
Description:	PFOA - DOD	Methanol (1 mM KOH)	042722	(98%)	
	28 components	2-Propanol	23214	(2%)	
Expiration Date:	080527				
Recommended Storage:	Freezer (0 °C)				
Nominal Concentration (µg/mL):	1.0				
NIST Test ID#:	6UTB	5E-05	Balance Uncertainty		
Volume(s) shown below were combined and diluted to (mL):		100.0	0.012	Flask Uncertainty	

Formulated By: Prashant Chauhan — 080522 DATE

Reviewed By: Pedro L. Rentas — 080522 DATE

Note: All assigned values are anion concentrations.

	Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Initial Conc.(µg/mL)	Final Conc.(µg/mL)	Expanded Uncertainty (+/-) µg/mL	SDS Information (Solvent Safety Info. On Attached pg.) Free Acid CAS#	OSHA PEL (TWA)	LD50
1.	Perfluoro-n-butanoic acid (PFBA)	99542	021022	0.02	2.00	0.017	50.1	1.00	0.02	375-22-4	N/A	N/A
2.	Perfluoro-n-pentanoic acid (PFPeA)	99543	050222	0.02	2.00	0.017	50.3	1.01	0.02	2706-90-3	N/A	N/A
3.	Perfluorohexanoic acid (PFHxA)	99199	071122	0.02	2.00	0.017	50.2	1.00	0.02	307-24-4	N/A	N/A
4.	Perfluoroheptanoic acid (PFHpA)	99197	040522	0.02	2.00	0.017	50.1	1.00	0.02	375-85-9	N/A	N/A
5.	Perfluorooctanoic acid (br-PFOA)*	99202	080522	0.02	2.00	0.017	50.2	1.00	0.02	335-67-1 (L)	N/A	ipr-rat 189mg/kg
6.	Perfluorononanoic acid (PFNA)	99200	050222	0.02	2.00	0.017	50.1	1.00	0.02	375-95-1	N/A	N/A
7.	Perfluorodecanoic acid (PFDA)	99195	041822	0.02	2.00	0.017	50.0	1.00	0.02	335-76-2	N/A	orl-rat 57mg/kg
8.	Perfluoroundecanoic acid (PFUnA)	99205	071522	0.02	2.00	0.017	50.2	1.00	0.02	2058-94-8	N/A	N/A
9.	Perfluorododecanoic acid (PFDoA)	99196	071522	0.02	2.00	0.017	50.1	1.00	0.02	307-55-1	N/A	N/A
10.	Perfluorotridecanoic acid (PFTrDA)	99204	021022	0.02	2.00	0.017	50.1	1.00	0.02	72629-94-8	N/A	N/A
11.	Perfluorotetradecanoic acid (PFTeDA)	99203	033022	0.02	2.00	0.017	50.1	1.00	0.02	376-06-7	N/A	N/A
12.	Perfluoro-1-octanesulfonamide (FOSA)	3677	FOSA0322I	0.02	2.00	0.017	50.0	1.00	0.05	754-91-6	N/A	N/A
13.	N-Methylperfluorooctanesulfonamidoacetic acid (br-NMeFOSAA)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	50.0	1.00	0.05	2355-31-9 (L)	N/A	N/A
14.	N-Ethylperfluorooctanesulfonamidoacetic acid (br-NEtFOSAA)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	50.0	1.00	0.05	2991-50-6 (L)	N/A	N/A
15.	Perfluorobutanesulfonic acid (PFBS)	99194	080522	0.02	2.00	0.017	50.2	1.00	0.02	375-73-5	N/A	N/A
16.	Perfluoro-1-pentanesulfonic acid (PFPeS)	99544	032422	0.02	2.00	0.017	50.1	1.00	0.02	2706-91-4	N/A	N/A
17.	Perfluorohexanesulfonic acid (br-PFHxS)*	99196	071522	0.02	2.00	0.017	50.2	1.00	0.02	355-46-4 (L)	N/A	N/A
18.	Perfluoro-1-heptanesulfonic acid (PFHpS)	3672	LPFHpS0122	0.021	2.10	0.017	47.6	1.00	0.05	375-92-8	N/A	N/A
19.	Heptadecafluorooctanesulfonic acid (br-PFOS)*	99201	033022	0.02	2.00	0.017	50.1	1.00	0.02	1763-23-1 (L)	N/A	N/A
20.	Perfluoro-1-nonanesulfonic acid (PFNS)	3957	LPFNS0422	0.021	2.10	0.017	48.0	1.01	0.05	68259-12-1	N/A	N/A
21.	Perfluoro-1-decanesulfonic acid (PFDS)	3671	LPFDS0222	0.021	2.10	0.017	48.2	1.01	0.05	335-77-3	N/A	N/A
22.	1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	65271	080522	0.02	2.00	0.017	50.2	1.00	0.05	757124-72-4	N/A	N/A
23.	1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	65272	071522	0.02	2.00	0.017	50.2	1.00	0.05	27619-97-2	N/A	N/A
24.	1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	3662	82FTS0122	0.021	2.10	0.017	47.9	1.01	0.05	39108-34-4	N/A	N/A
25.	2-(Heptafluoropropoxy)-2,3,3,3-tetrafluoropropionic acid (HFPO-DA)	99668	080522	0.02	2.00	0.017	50.1	1.00	0.02	13252-13-6	N/A	N/A
26.	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	4165	11ClPF3OUdS0222	0.021	2.12	0.017	47.1	1.00	0.05	763051-92-9	N/A	N/A
27.	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	4164	9ClPF3ONS0522	0.021	2.14	0.017	48.6	1.00	0.05	756426-58-1	N/A	N/A
28.	Dodecafluoro-3H-4,6-dioxanonanoic acid (ADONA)	4103	NaDONA0422	0.021	2.12	0.017	47.1	1.00	0.05	919005-14-4	N/A	N/A
	Perfluorooctanoic acid (linear)*	99202	080522	0.02	2.00	0.004	49.6	0.99	0.010	335-67-1 (L)	N/A	ipr-rat 189mg/kg
	Perfluorooctanoic acid (branched isomer)*	99202	080522	0.02	2.00	0.004	0.6	0.01	0.001	335-67-1 (L)	N/A	ipr-rat 189mg/kg
	Perfluorohexanesulfonic acid (linear)*	99196	071522	0.02	2.00	0.017	44.2	0.88	0.02	355-46-4 (L)	N/A	N/A
	Perfluorohexanesulfonic acid (branched isomer)*	99196	071522	0.02	2.00	0.017	6.0	0.12	0.0021	355-46-4 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (linear)*	99201	033022	0.02	2.00	0.017	38.1	0.76	0.02	1763-23-1 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	7.5	0.15	0.003	1763-23-1 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	4.0	0.08	0.002	1763-23-1 (L)	N/A	N/A
	Heptadecafluorooctanesulfonic acid (branched isomer)*	99201	033022	0.02	2.00	0.017	0.5	0.010	0.0002	1763-23-1 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (linear)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	36.0	0.72	0.04	2355-31-9 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	6.5	0.13	0.011	2355-31-9 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	5.0	0.10	0.005	2355-31-9 (L)	N/A	N/A
	N-Methylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4162	brNMeFOSAA0621	0.02	2.00	0.017	2.5	0.05	0.0009	2355-31-9 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (linear)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	36.6	0.73	0.04	2991-50-6 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	7.7	0.15	0.009	2991-50-6 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	5.3	0.11	0.005	2991-50-6 (L)	N/A	N/A
	N-Ethylperfluoro-1-octanesulfonamidoacetic acid (branched)*	4163	brNEtFOSAA1121	0.02	2.00	0.017	0.4	0.007	0.0006	2991-50-6 (L)	N/A	N/A

*Concentrations for branched and linear isomers are based on LCMS chromatographic analysis only.

A qualitative standard (Sect. 3.19) is available for PFOA that contains the linear and branched isomers (Wellington Labs, Cat. No. T-PFOA, or equivalent). This qualitative PFOA standard must be purchased and used to identify the retention times of the branched PFOA isomers, but the linear only PFOA standard must be used for quantitation (Sect. 12.2) until a quantitative PFOA standard containing the branched and linear isomers becomes commercially available.1

- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.
- Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result." NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC, (1994).

BATTELLE

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BDO Id: 230124-01

ea ent eceipt eport

Approved: ☐ **Aut ori ed** ☐

Name:	d-N-MeFOSA-M	**Received:**	1/24/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	dNMeFOSA1122M	**Expires:**	11/11/2027
Type:	Solution	**Consumed:**	
Lot No:	dNMeFOSA1122M	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	d-N-MeFOSA-M		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
d3-MeFOSA	BDO-2370	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230124-01

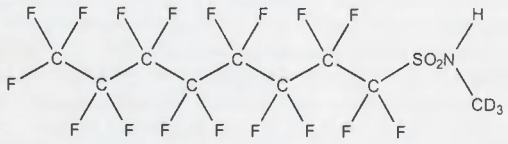
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d-N-MeFOSA-M
COMPOUND: N-Methyl-d_3-perfluoro-1-octanesulfonamide
LOT NUMBER: dNMeFOSA1122M

STRUCTURE:

CAS #: 936109-37-4



MOLECULAR FORMULA:	$C_9D_3HF_{17}NO_2S$	**MOLECULAR WEIGHT:**	516.19
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	11/11/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/11/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: _____ **Date:** 11/14/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BDO Id: 230124-02

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Approved: ☐ Aut ori ed ☐

Name: FPrPA
Vendor: Wellington Laboratories
Catalogue No: FPrPA0122
Type: Solution
Lot No: FPrPA0122
Quantity: 1 ea ampoule **% Moisture:**
Description: FPrPA

Received: 1/24/2023
Custodian: Kinsman, Nathaniel
Expires: 2/3/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
3-perfluoropropyl propanoic Acid	356-02-5	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230124-02

WELLINGTON LABORATORIES

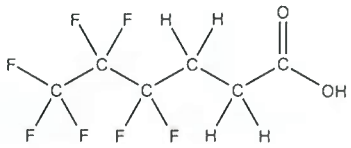
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FPrPA
COMPOUND: 3-Perfluoropropyl propanoic acid

LOT NUMBER: FPrPA0122

STRUCTURE:

CAS #: 356-02-5



MOLECULAR FORMULA:	$C_6H_5F_7O_2$	**MOLECULAR WEIGHT:**	242.09
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	02/03/2022		
EXPIRY DATE: (mm/dd/yyyy)	02/03/2027		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

- Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
  Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains <1% of the unsaturated 3:3 telomer acid ($C_6H_3F_7O_2$) as an impurity determined by ^{19}F NMR.

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Certified By: B.G. Chittim, General Manager **Date:** 02/04/2022 (mm/dd/yyyy)

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BDO Id: 230124-03

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Approved: ☐ Aut ori ed ☐

Name: FPePA
Vendor: Wellington Laboratories
Catalogue No: FPePA1122
Type: Solution
Lot No: FPePA1122
Quantity: 1 ea ampoule **% Moisture:**
Description: FPePA

Received: 1/24/2023
Custodian: Kinsman, Nathaniel
Expires: 11/21/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
3-Perfluoropentyl propanoic acid	914637-49-3	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

WELLINGTON LABORATORIES

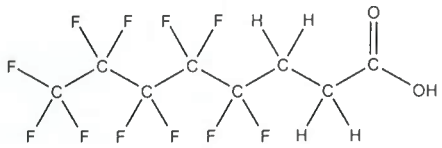
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: FPePA
COMPOUND: 3-Perfluoropentyl propanoic acid

LOT NUMBER: FPePA1122

STRUCTURE:

CAS #: 914637-49-3



MOLECULAR FORMULA:	$C_8H_5F_{11}O_2$	**MOLECULAR WEIGHT:**	342.11
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	11/21/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/21/2027		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains <0.5% of the unsaturated 5:3 telomer acid ($C_8H_3F_{11}O_2$) as an impurity determined by ^1H and ^{19}F NMR.

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Certified By: _____ **Date:** 11/23/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

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BDO Id: 230124-04

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Approved: ☐ Aut ori ed ☐

Name: FHpPA
Vendor: Wellington Laboratories
Catalogue No: FHpPA1122
Type: Solution
Lot No: FHpPA1122
Quantity: 1 ea ampoule **% Moisture:**
Description: FHpPA

Received: 1/24/2023
Custodian: Kinsman, Nathaniel
Expires: 11/21/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
3-Perfluoroheptyl propanoic acid	812-70-4	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230124-04

WELLINGTON LABORATORIES

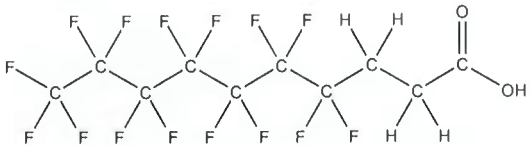
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: FHpPA
COMPOUND: 3-Perfluoroheptyl propanoic acid

LOT NUMBER: FHpPA1122

STRUCTURE:

CAS #: 812-70-4



MOLECULAR FORMULA: $C_{10}H_5F_{15}O_2$
MOLECULAR WEIGHT: 442.12
CONCENTRATION: 50.0 ± 2.5 µg/mL
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/21/2022
EXPIRY DATE: (mm/dd/yyyy) 11/21/2027
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.1% of 3-perfluorohexyl propanoic acid (6:3 telomer acid) and ~0.2% of perfluoro-n-heptanoic acid (PFHpA).

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Certified By: _____ **Date:** 11/24/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BDO Id: 230124-05

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Approved: ☐ **Aut ori ed** ☐

Name:	d7-N-MeFOSE-M	**Received:**	1/24/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	d7NMeFOSE1222M	**Expires:**	12/16/2027
Type:	Solution	**Consumed:**	
Lot No:	d7NMeFOSE1222M	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	d7-N-MeFOSE-M		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
d7-MeFOSE	1265205-95-5	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230124-05

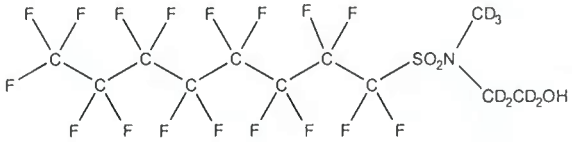
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d7-N-MeFOSE-M **LOT NUMBER:** d7NMeFOSE1222M

COMPOUND: 2-(N-methyl-d3-perfluoro-1-octanesulfonamido)ethan-d4-ol

STRUCTURE: **CAS #:** 1265205-95-5



MOLECULAR FORMULA:	$C_{11}D_7HF_{17}NO_3S$	**MOLECULAR WEIGHT:**	564.27
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_7$
LAST TESTED: (mm/dd/yyyy)	12/16/2022 (HRGC/LRMS) 12/05/2022 (LC/MS)		
EXPIRY DATE: (mm/dd/yyyy)	12/16/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS Data (Full Scan and Mass Spectrum)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- In order to see the molecular ion (adduct free), the LC mobile phase should be free of ammonium acetate buffer.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/16/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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BDO Id: 230124-06

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Approved: ☐ Aut ori ed ☐

Name: d9-N-EtFOSE-M
Vendor: Wellington Laboratories
Catalogue No: d9NEtFOSE1221M
Type: Solution
Lot No: d9NEtFOSE1221M
Quantity: 1 ea ampoule **% Moisture:**
Description: d9-N-EtFOSE-M

Received: 1/24/2023
Custodian: Kinsman, Nathaniel
Expires: 1/27/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
d9-EtFOSE	BDO-2386	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230124-06

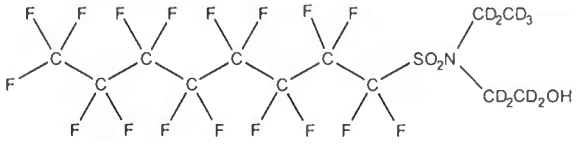
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d9-N-EtFOSE-M **LOT NUMBER:** d9NEtFOSE1221M

COMPOUND: 2-(N-ethyl-d5-perfluoro-1-octanesulfonamido)ethan-d4-ol

STRUCTURE: **CAS #:** 1265205-96-6



MOLECULAR FORMULA:	$C_{12}D_9HF_{17}NO_3S$	**MOLECULAR WEIGHT:**	580.31
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_9$
LAST TESTED: (mm/dd/yyyy)	12/13/2021 (HRGC/LRMS) 01/27/2022 (LC/MS)		
EXPIRY DATE: (mm/dd/yyyy)	01/27/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS Data (Full Scan and Mass Spectrum)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- In order to see the molecular ion (adduct free), the LC mobile phase should be free of ammonium acetate buffer.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 02/03/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230124-09

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: d-N-EtFOSA-M
Vendor: Wellington Laboratories
Catalogue No: dNEtFOSA1022M
Type: Solution
Lot No: dNEtFOSA1022M
Quantity: 1 ea ampoule **% Moisture:**
Description: d-N-EtFOSA-M

Received: 1/24/2023
Custodian: Kinsman, Nathaniel
Expires: 11/7/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
d5-EtFOSA	BDO-2371	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

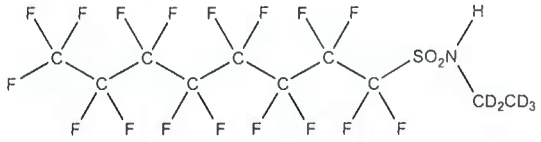
Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230124-09

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	d-N-EtFOSA-M	**LOT NUMBER:**	dNEtFOSA1022M
COMPOUND:	N-Ethyl-d_5-perfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	936109-40-9



MOLECULAR FORMULA:	$C_{10}D_5HF_{17}NO_2S$	**MOLECULAR WEIGHT:**	532.23
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy)	11/07/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/07/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.3% of an unknown isomeric impurity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/08/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

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BATTELLE
It can be done

BDO Id: 230210-03

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: 13C4-PFBA
Vendor: Wellington Laboratories
Catalogue No: 13C4-PFBA
Type: Solution
Lot No: MPFBA0522
Quantity: 2 ea Ampoules **% Moisture:**
Description: 13C4-PFBA

Received: 2/10/2023
Custodian: Fuhry, Paul
Expires: 5/19/2027
Consumed:
Stored In: VOC Laboratory - R0121

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C4-PFBA	BDO-2105	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230210-03

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFBA	**LOT NUMBER:**	MPFBA0522
COMPOUND:	Perfluoro-n-(1,2,3,4-$^{13}C_4$)butanoic acid		
STRUCTURE:		**CAS #:**	1017281-29-6

MOLECULAR FORMULA:	$^{13}C_4HF_7O_2$	**MOLECULAR WEIGHT:**	218.01
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	05/19/2022		
EXPIRY DATE: (mm/dd/yyyy)	05/19/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/25/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

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BATTELLE
It can be done

BDO Id: 230210-04

ea ent eceipt eport

Approved: ☐ **Aut ori ed** ☐

Name:	13C5-PFPeA	**Received:**	2/10/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	13C5-PFPeA	**Expires:**	10/4/2027
Type:	Solution	**Consumed:**	
Lot No:	M5PFPeA0922	**Stored In:**	VOC Laboratory - R0121
Quantity:	2 ea Ampoules **% Moisture:**		
Description:	13C5-PFPeA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C5-PFPeA	BDO-2216	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

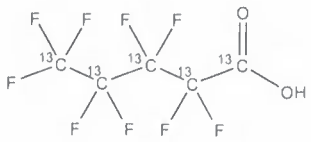
Authorized by: _____ **Authorized on:** _____

230210-04

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M5PFPeA	**LOT NUMBER:**	M5PFPeA0922
COMPOUND:	Perfluoro-n-($^{13}C_5$)pentanoic acid		
STRUCTURE:		**CAS #:**	2283397-79-3



MOLECULAR FORMULA:	$^{13}C_5HF_9O_2$	**MOLECULAR WEIGHT:**	269.01
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	10/04/2022		
EXPIRY DATE: (mm/dd/yyyy)	10/04/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/31/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BDO Id: 230210-05

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: 13C8-FOSA-I
Vendor: Wellington Laboratories
Catalogue No: 13C8-FOSA-I
Type: Solution
Lot No: M8FOSA08221
Quantity: 2 ea Ampoules **% Moisture:**
Description: 13C8-FOSA-I

Received: 2/10/2023
Custodian: Fuhry, Paul
Expires: 8/16/2027
Consumed:
Stored In: VOC Laboratory - R0121

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C8-FOSA	BDO-2225	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

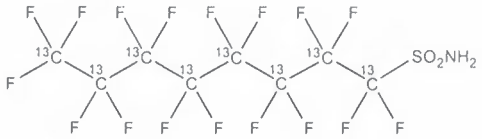
Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230210-05

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	M8FOSA-I	**LOT NUMBER:**	M8FOSA0822I
COMPOUND:	Perfluoro-1-($^{13}C_8$)octanesulfonamide		
STRUCTURE:		**CAS #:**	1365803-60-6



MOLECULAR FORMULA:	$^{13}C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	507.09
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	08/16/2022		
EXPIRY DATE: (mm/dd/yyyy)	08/16/2027		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.9% of perfluoro-1-($^{13}C_4$)octanesulfonamide and ~0.2% of perfluoro-1-($^{13}C_7$)heptanesulfonamide.

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Certified By: _____ **Date:** 08/25/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230210-06

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: 13C2-6:2FTS
Vendor: Wellington Laboratories
Catalogue No: 13C2-6:2FTS
Type: Solution
Lot No: M262FTS1122
Quantity: 2 ea Ampoules **% Moisture:**
Description: 13C2-6:2FTS

Received: 2/10/2023
Custodian: Fuhry, Paul
Expires: 11/24/2027
Consumed:
Stored In: VOC Laboratory - R0121

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C2-6:2FTS	BDO-2230	47.6000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	13C2-6:2FTS	Acid

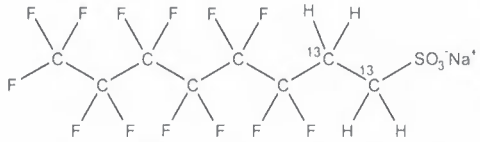
Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230210-06

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	M2-6:2FTS	**LOT NUMBER:**	M262FTS1122
COMPOUND:	Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)octanesulfonate		
STRUCTURE:		**CAS #:**	2708218-89-5



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	452.13
CONCENTRATION:	50.0 ± 2.5 µg/mL (Na salt) 47.6 ± 2.4 µg/mL (M2-6:2FTS acid) 47.5 ± 2.4 µg/mL (M2-6:2FTS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/24/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/24/2027		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 6:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/13/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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It can be done

BDO Id: 230210-07

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: 13C2-8:2FTS
Vendor: Wellington Laboratories
Catalogue No: 13C2-8:2FTS
Type: Solution
Lot No: M282FTS1122
Quantity: 2 ea Ampoules **% Moisture:**
Description: 13C2-8:2FTS

Received: 2/10/2023
Custodian: Fuhry, Paul
Expires: 11/10/2027
Consumed:
Stored In: VOC Laboratory - R0121

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C2-8:2FTS	BDO-2220	48.0000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	13C2-8:2FTS	Acid

Approved by: **Approved on:**
Authorized by: **Authorized on:**

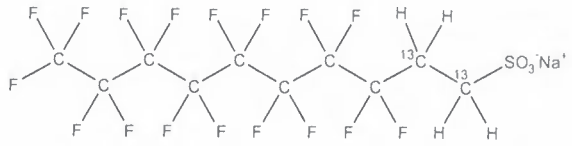
230210-07

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-8:2FTS
LOT NUMBER: M282FTS1122
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)decanesulfonate

STRUCTURE:
CAS #: 2708218-90-8



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$
MOLECULAR WEIGHT: 552.15
CONCENTRATION: 50.0 ± 2.5 µg/mL (Na salt)
48.0 ± 2.4 µg/mL (M2-8:2FTS acid)
47.9 ± 2.4 µg/mL (M2-8:2FTS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 11/10/2022
EXPIRY DATE: (mm/dd/yyyy) 11/10/2027
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 8:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

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Certified By: _____ **Date:** 11/18/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

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BDO Id: 230210-08

ea ent eceipt eport

Approved: ☐ **Aut ori ed** ☐

Name:	13C2-4:2FTS	**Received:**	2/10/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	13C2-4:2FTS	**Expires:**	9/15/2027
Type:	Solution	**Consumed:**	
Lot No:	M242FTS0922	**Stored In:**	VOC Laboratory - R0121
Quantity:	2 ea Ampoules **% Moisture:**		
Description:	13C2-4:2FTS		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C2-4:2FTS	BDO-2229	46.9000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	13C2-4:2FTS	Acid

Approved by: _____ **Approved on:** _____

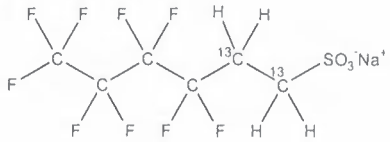
Authorized by: _____ **Authorized on:** _____

230210-08

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2-4:2FTS	**LOT NUMBER:**	M242FTS0922
COMPOUND:	Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)hexanesulfonate		
STRUCTURE:		**CAS #:**	2708218-88-4



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_4H_4F_9SO_3Na$	**MOLECULAR WEIGHT:**	352.12
CONCENTRATION:	50.0 ± 2.5 µg/mL (Na salt) 46.9 ± 2.3 µg/mL (M2-4:2FTS acid) 46.7 ± 2.3 µg/mL (M2-4:2FTS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	09/15/2022		
EXPIRY DATE: (mm/dd/yyyy)	09/15/2027		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 4:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 4:2FTS and M2-4:2FTS will produce signals in the m/z 329 to m/z 309 channel during SRM analysis. We recommend using the m/z 329 to m/z 81 transition to monitor for M2-4:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

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Certified By: _____ **Date:** 10/18/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

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BDO Id: 230306-07

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: 13C4-PFOS
Vendor: Wellington Laboratories
Catalogue No: MPFOS
Type: Solution
Lot No: MPFOS1022
Quantity: 1 ea Ampoule **% Moisture:**
Description: Sodium perfluoro-1-(1,2,3,4-13C4)octanesulfonate

Received: 3/6/2023
Custodian: Fuhry, Paul
Expires: 11/8/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C4-PFOS	BDO-2121	47.9000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	13C4-PFOS	Acid Concentration

Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230306-07

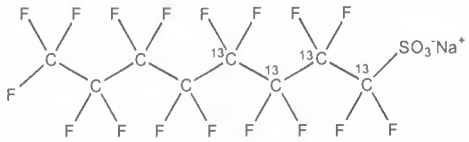
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS1022

COMPOUND: Sodium perfluoro-1-(1,2,3,4-$^{13}C_4$)octanesulfonate

STRUCTURE: **CAS #:** 960315-53-1



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
CONCENTRATION:	50.0 ± 2.5 µg/mL (Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/mL (MPFOS acid)		
	47.8 ± 2.4 µg/mL (MPFOS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	11/08/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/08/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.7% of perfluoro-n-($^{13}C_4$)octanoic acid (MPFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/11/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230306-08

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: 13C3-HFPO-DA
Vendor: Wellington Laboratories
Catalogue No: M3HFPO-DA
Type: Solution
Lot No: M3HFPODA1022
Quantity: 1 ea Ampoule **% Moisture:**
Description: 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)(13C3)propanoic acid

Received: 3/6/2023
Custodian: Fuhry, Paul
Expires: 11/8/2025
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C3-HFPO-DA	BDO-2276	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230306-08

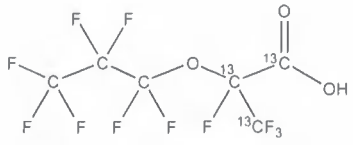
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M3HFPO-DA **LOT NUMBER:** M3HFPODA1022

COMPOUND: 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)($^{13}C_3$)propanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_3{}^{12}C_3HF_{11}O_3$	**MOLECULAR WEIGHT:**	333.03
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	11/08/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/08/2025		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Product is commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/10/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE

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BDO Id: 230306-09

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Approved: ☐ Aut ori ed ☐

Name: d3-N-MeFOSAA
Vendor: Wellington Laboratories
Catalogue No: d3-N-MeFOSAA
Type: Solution
Lot No: d3NMeFOSAA1022
Quantity: 1 ea Ampoule **% Moisture:**
Description: N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

Received: 3/6/2023
Custodian: Fuhry, Paul
Expires: 10/18/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
d3-MeFOSAA	BDO-1838	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230306-09

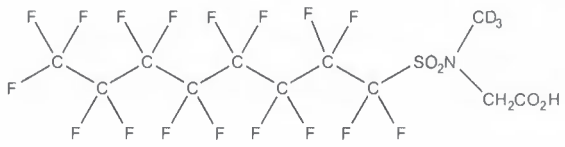
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA1022

COMPOUND: N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** 1400690-70-1



MOLECULAR FORMULA:	$C_{11}D_3H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	574.23
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	10/18/2022		
EXPIRY DATE: (mm/dd/yyyy)	10/18/2027		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/24/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

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BATTELLE

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BDO Id: 230306-10

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name:	d5-N-EtFOSAA	**Received:**	3/6/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	d5-N-EtFOSAA	**Expires:**	12/30/2027
Type:	Solution	**Consumed:**	
Lot No:	d5NEtFOSAA1222	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea Ampoule **% Moisture:**		
Description:	N-Ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
d5-EtFOSAA	BDO-1839	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230306-10

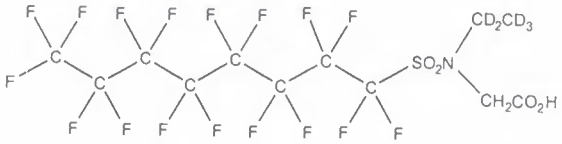
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA
LOT NUMBER: d5NEtFOSAA1222
COMPOUND: N-Ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #: 1265205-97-7



MOLECULAR FORMULA: $C_{12}D_5H_3F_{17}NO_4S$
MOLECULAR WEIGHT: 590.26
CONCENTRATION: 50.0 ± 2.5 µg/mL
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy) 12/30/2022
EXPIRY DATE: (mm/dd/yyyy) 12/30/2027
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim, General Manager **Date:** 01/13/2023 (mm/dd/yyyy)

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BATTELLE
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BDO Id: 230306-11

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Approved: ☐ Aut ori ed ☐

Name: 13C3-PFBS
Vendor: Wellington Laboratories
Catalogue No: M3PFBS
Type: Solution
Lot No: M3PFBS1122
Quantity: 1 ea Ampoule **% Moisture:**
Description: Sodium perfluoro-1-(2,3,4-13C3)butanesulfonate

Received: 3/6/2023
Custodian: Fuhry, Paul
Expires: 11/21/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C3-PFBS	BDO-2226	46.6000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

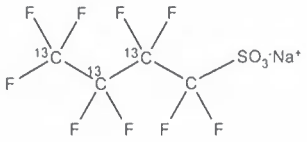
	Analyte:	Comment:
1	13C3-PFBS	Acid Concentration

Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M3PFBS	**LOT NUMBER:**	M3PFBS1122
COMPOUND:	Sodium perfluoro-1-(2,3,4-$^{13}C_3$)butanesulfonate		
STRUCTURE:		**CAS #:**	2708218-84-0



MOLECULAR FORMULA:	$^{13}C_3{}^{12}CF_9SO_3Na$	**MOLECULAR WEIGHT:**	325.06
CONCENTRATION:	50.0 ± 2.5 µg/mL (Na salt) 46.6 ± 2.3 µg/mL (M3PFBS acid) 46.5 ± 2.3 µg/mL (M3PFBS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($2,3,4\text{-}^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	11/21/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/21/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/24/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230306-12

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: 13C3-PFHxS
Vendor: Wellington Laboratories
Catalogue No: M3PFHxS
Type: Solution
Lot No: M3PFHxS0822
Quantity: 1 ea Ampoule **% Moisture:**
Description: Sodium perfluoro-1-(1,2,3-13C3)hexanesulfonate

Received: 3/6/2023
Custodian: Fuhry, Paul
Expires: 8/11/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C3-PFHxS	BDO-2227	47.4000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	13C3-PFHxS	Acid Concentration

Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230306-12

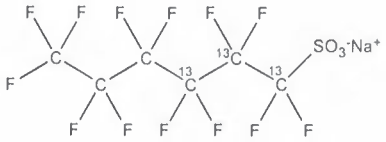
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M3PFHxS **LOT NUMBER:** M3PFHxS0822

COMPOUND: Sodium perfluoro-1-(1,2,3-$^{13}C_3$)hexanesulfonate

STRUCTURE: **CAS #:** 2708218-86-2



MOLECULAR FORMULA:	$^{13}C_3{}^{12}C_3F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	425.07
CONCENTRATION:	50.0 ± 2.5 µg/mL (Na salt)	**SOLVENT(S):**	Methanol
	47.4 ± 2.4 µg/mL (M3PFHxS acid)		
	47.3 ± 2.4 µg/mL (M3PFHxS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3\text{-}^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	08/11/2022		
EXPIRY DATE: (mm/dd/yyyy)	08/11/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/26/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230306-13

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: 13C8-PFOS
Vendor: Wellington Laboratories
Catalogue No: M8PFOS
Type: Solution
Lot No: M8PFOS0522
Quantity: 1 ea Ampoule **% Moisture:**
Description: Sodium perfluoro-1-(13C8)octanesulfonate

Received: 3/6/2023
Custodian: Fuhry, Paul
Expires: 5/19/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C8-PFOS	BDO-2228	47.9000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	13C8-PFOS	Acid Concentration

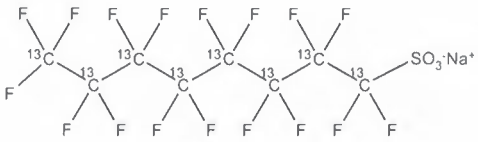
Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230306-13

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M8PFOS	**LOT NUMBER:**	M8PFOS0522
COMPOUND:	Sodium perfluoro-1-($^{13}C_8$)octanesulfonate		
STRUCTURE:		**CAS #:**	2522762-16-7



MOLECULAR FORMULA:	$^{13}C_8F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	530.05
CONCENTRATION:	50.0 ± 2.5 µg/mL (Na salt) 47.9 ± 2.4 µg/mL (M8PFOS acid) 47.8 ± 2.4 µg/mL (M8PFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	05/19/2022		
EXPIRY DATE: (mm/dd/yyyy)	05/19/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.2% of sodium perfluoro-1-($^{13}C_7$)heptanesulfonate ($^{13}C_7$-PFHpS) and ~1.1% of sodium perfluoro-1-(1,2,3,4-$^{13}C_4$)octanesulfonate (MPFOS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/25/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230306-14

ea ent eceipt eport

Approved: ☐ **Aut ori ed** ☐

Name:	13C2-PFDoA	**Received:**	3/6/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	MPFDoA	**Expires:**	12/21/2027
Type:	Solution	**Consumed:**	
Lot No:	MPFDoA1222	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea Ampoule **% Moisture:**		
Description:	Perfluoro-n-(1,2-13C2)dodecanoic acid		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C2-PFDoA	BDO-2112	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

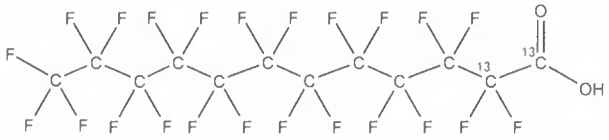
Authorized by: _____ **Authorized on:** _____

230306-14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDoA	**LOT NUMBER:**	MPFDoA1222
COMPOUND:	Perfluoro-n-(1,2-$^{13}C_2$)dodecanoic acid		
STRUCTURE:		**CAS #:**	960315-52-0



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{10}HF_{23}O_2$	**MOLECULAR WEIGHT:**	616.08
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	12/21/2022		
EXPIRY DATE: (mm/dd/yyyy)	12/21/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 01/13/2023 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230306-15

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: 13C2-PFTeDA
Vendor: Wellington Laboratories
Catalogue No: M2PFTeDA
Type: Solution
Lot No: M2PFTeDA1122
Quantity: 1 ea Ampoule **% Moisture:**
Description: Perfluoro--n-(1,2-13C2)tetradecanoic acid

Received: 3/6/2023
Custodian: Fuhry, Paul
Expires: 11/16/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C2-PFTeDA	BDO-2224	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

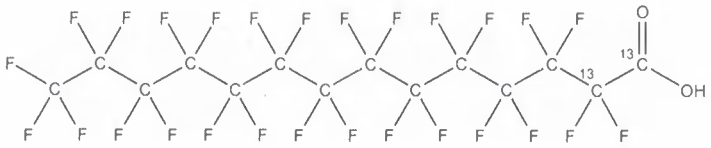
Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230306-15

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFTeDA	**LOT NUMBER:**	M2PFTeDA1122
COMPOUND:	Perfluoro-n-(1,2-$^{13}C_2$)tetradecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{12}HF_{27}O_2$	**MOLECULAR WEIGHT:**	716.10
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2$-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/16/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/16/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/25/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230306-16

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: 13C6-PFDA
Vendor: Wellington Laboratories
Catalogue No: M6PFDA
Type: Solution
Lot No: M6PFDA0922
Quantity: 1 ea Ampoule **% Moisture:**
Description: Perfluoro-n-(1,2,3,4,5,6-13C6)decanoic acid

Received: 3/6/2023
Custodian: Fuhry, Paul
Expires: 9/15/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C6-PFDA	BDO-2222	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

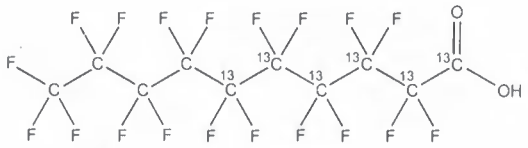
Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230306-16

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M6PFDA	**LOT NUMBER:**	M6PFDA0922
COMPOUND:	Perfluoro-n-(1,2,3,4,5,6-$^{13}C_6$)decanoic acid		
STRUCTURE:		**CAS #:**	2328024-56-0



MOLECULAR FORMULA:	$^{13}C_6{}^{12}C_4HF_{19}O_2$	**MOLECULAR WEIGHT:**	520.04
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4,5,6-$^{13}C_6$)
LAST TESTED: (mm/dd/yyyy)	09/15/2022		
EXPIRY DATE: (mm/dd/yyyy)	09/15/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/01/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
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BDO Id: 230306-17

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: 13C7-PFUdA
Vendor: Wellington Laboratories
Catalogue No: M7PFUdA
Type: Solution
Lot No: M7PFUdA0522
Quantity: 1 ea Ampoule **% Moisture:**
Description: Perfluoro-n-(1,2,3,4,5,6,7-13C7)undecanoic acid

Received: 3/6/2023
Custodian: Fuhry, Paul
Expires: 6/8/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C7-PFUnA	BDO-2223	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

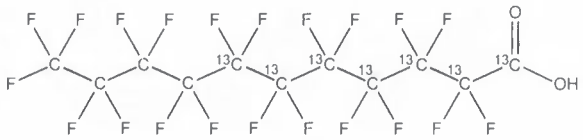
Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230306-17

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M7PFUdA	**LOT NUMBER:**	M7PFUdA0522
COMPOUND:	Perfluoro-n-(1,2,3,4,5,6,7-$^{13}C_7$)undecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_7{}^{12}C_4HF_{21}O_2$	**MOLECULAR WEIGHT:**	571.04
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C
LAST TESTED: (mm/dd/yyyy)	06/08/2022		(1,2,3,4,5,6,7-$^{13}C_7$)
EXPIRY DATE: (mm/dd/yyyy)	06/08/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/30/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE

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BDO Id: 230306-18

ea ent eceipt eport

Approved: ☐ **Aut ori ed** ☐

Name:	13C5-PFHxA	**Received:**	3/6/2023
Vendor:	Wellington Laboratories	**Custodian:**	Fuhry, Paul
Catalogue No:	M5PFHxA	**Expires:**	11/24/2027
Type:	Solution	**Consumed:**	
Lot No:	M5PFHxA1122	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea Ampoule **% Moisture:**		
Description:	Perfluoro-n-(1,2,3,4,5-13C5)hexanoic acid		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C5-PFHxA	BDO-2217	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230306-18

WELLINGTON LABORATORIES

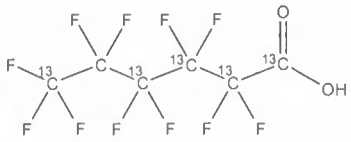
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M5PFHxA
COMPOUND: Perfluoro-n-(1,2,3,4,6-$^{13}C_5$)hexanoic acid

LOT NUMBER: M5PFHxA1122

STRUCTURE:

CAS #: 2328024-54-8



MOLECULAR FORMULA:	$^{13}C_5{}^{12}C_1HF_{11}O_2$	**MOLECULAR WEIGHT:**	319.02
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4,6$-$^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	11/24/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/24/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/13/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
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BDO Id: 230306-19

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Approved: ☐ Aut ori ed ☐

Name: 13C4-PFHpA
Vendor: Wellington Laboratories
Catalogue No: M4PFHpA
Type: Solution
Lot No: M4PFHpA1222
Quantity: 1 ea Ampoule **% Moisture:**
Description: Perfluoro-n-(1,2,3,4-13C4)heptanoic acid

Received: 3/6/2023
Custodian: Fuhry, Paul
Expires: 12/12/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C4-PFHpA	BDO-2218	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

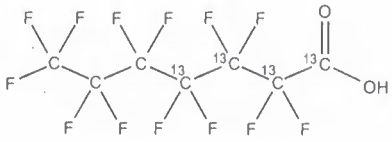
Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230306-19

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M4PFHpA	**LOT NUMBER:**	M4PFHpA1222
COMPOUND:	Perfluoro-n-(1,2,3,4-$^{13}C_4$)heptanoic acid		
STRUCTURE:		**CAS #:**	2328024-55-9



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_3HF_{13}O_2$	**MOLECULAR WEIGHT:**	368.03
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	12/12/2022		
EXPIRY DATE: (mm/dd/yyyy)	12/12/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~0.03% of perfluoro-n-heptanoic acid (PFHpA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/13/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
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BDO Id: 230306-20

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: 13C9-PFNA
Vendor: Wellington Laboratories
Catalogue No: M9PFNA
Type: Solution
Lot No: M9PFNA1122
Quantity: 1 ea Ampoule **% Moisture:**
Description: Perfluoro-n-(13C9)nonanoic acid

Received: 3/6/2023
Custodian: Fuhry, Paul
Expires: 11/24/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C9-PFNA	BDO-2221	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

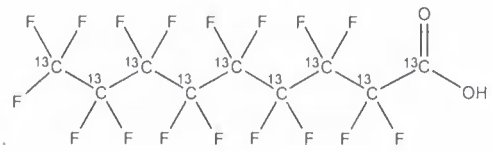
Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230306-20

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M9PFNA	**LOT NUMBER:**	M9PFNA1122
COMPOUND:	Perfluoro-n-($^{13}C_9$)nonanoic acid		
STRUCTURE:		**CAS #:**	2283397-80-6



MOLECULAR FORMULA:	$^{13}C_9HF_{17}O_2$	**MOLECULAR WEIGHT:**	473.01
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_9$)
LAST TESTED: (mm/dd/yyyy)	11/24/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/24/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~1.0% of perfluoro-n-($^{13}C_5$)nonanoic acid (MPFNA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/09/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230306-24

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: 13C8-PFOA
Vendor: Wellington Laboratories
Catalogue No: M8PFOA
Type: Solution
Lot No: M8PFOA0522
Quantity: 1 ea Ampoule **% Moisture:**
Description: Perfluoro-n-(13C8)octanoic acid

Received: 3/6/2023
Custodian: Fuhry, Paul
Expires: 5/30/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C8-PFOA	BDO-2219	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

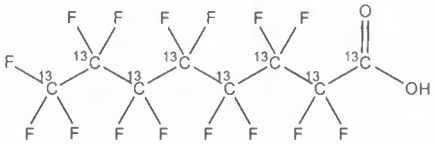
Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230306-24

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M8PFOA	**LOT NUMBER:**	M8PFOA0522
COMPOUND:	Perfluoro-n-($^{13}C_8$)octanoic acid		
STRUCTURE:		**CAS #:**	1350614-84-4



MOLECULAR FORMULA:	$^{13}C_8HF_{15}O_2$	**MOLECULAR WEIGHT:**	422.01
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	05/30/2022		
EXPIRY DATE: (mm/dd/yyyy)	05/30/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~1.0% of perfluoro-n-($^{13}C_4$)octanoic acid (MPFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/02/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230608-01

ea ent eceipt eport

Approved: ☐ **Aut ori ed** ☐

Name:	L-PFDoS	**Received:**	6/8/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	LPFDoS0423	**Expires:**	4/19/2028
Type:	Solution	**Consumed:**	
Lot No:	LPFDoS0423	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	2 ea ampoules **% Moisture:**		
Description:	L-PFDoS		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
Perfluoro-1-dodecanesulfonate	79780-39-5	48.5000	98.00	--	--	☐		0	0 **1**

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	Perfluoro-1-dodecanesulfonate	as acid

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

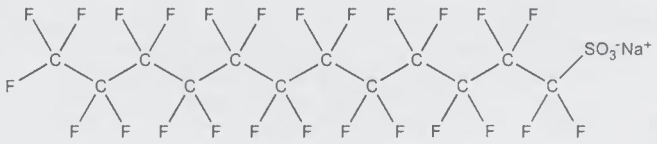
230608-01

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFDoS
LOT NUMBER: LPFDoS0423
COMPOUND: Sodium perfluoro-1-dodecanesulfonate

STRUCTURE:
CAS #: 1260224-54-1



MOLECULAR FORMULA:	$C_{12}F_{25}SO_3Na$	**MOLECULAR WEIGHT:**	722.14
CONCENTRATION:	50.0 ± 2.5 µg/mL (Na salt) 48.5 ± 2.4 µg/mL (PFDoS acid) 48.4 ± 2.4 µg/mL (PFDoS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	04/19/2023		
EXPIRY DATE: (mm/dd/yyyy)	04/19/2028		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.5% perfluoro-n-dodecanoic acid (PFDoA) and ~0.6% sodium perfluoro-1-undecanesulfonate (L-PFUdS)

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/21/2023 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230608-02

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: PFEESA
Vendor: Wellington Laboratories
Catalogue No: PFEESA1022
Type: Solution
Lot No: PFEESA1022
Quantity: 1 ea ampoule **% Moisture:**
Description: PFEESA

Received: 6/8/2023
Custodian: Kinsman, Nathaniel
Expires: 1/20/2028
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
Perfluoro (2-ethoxyethane) sulfonic a	113507-82-7	44.6000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	Perfluoro (2-ethoxyethane) sulfonic acid	as acid

Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230608-02

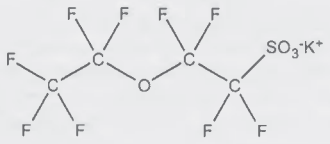
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFEESA **LOT NUMBER:** PFEESA1022

COMPOUND: Potassium perfluoro(2-ethoxyethane)sulfonate

STRUCTURE:



CAS #: 117205-07-9

MOLECULAR FORMULA:	$C_4F_9SO_4K$	**MOLECULAR WEIGHT:**	354.19
CONCENTRATION:	50.0 ± 2.5 µg/mL (K salt)	**SOLVENT(S):**	Methanol
	44.6 ± 2.2 µg/mL (PFEESA acid)		
	44.5 ± 2.2 µg/mL (PFEESA anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	01/20/2023		
EXPIRY DATE: (mm/dd/yyyy)	01/20/2028		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.2% of perfluoro-n-octanoic acid (PFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 01/31/2023 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230608-03

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: 10:2FTS
Vendor: Wellington Laboratories
Catalogue No: 102FTS1122
Type: Solution
Lot No: 102FTS1122
Quantity: 1 ea ampoule **% Moisture:**
Description: 10:2FTS

Received: 6/8/2023
Custodian: Kinsman, Nathaniel
Expires: 12/1/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
1H,1H,2H,2H-perfluorododecane sulf	120226-60-0	48.3000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	1H,1H,2H,2H-perfluorododecane sulfonate	as acid

Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

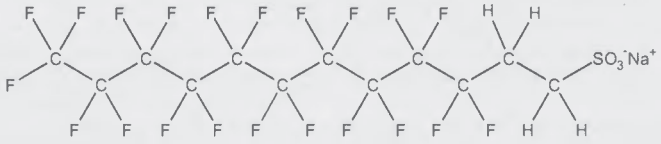
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 10:2FTS **LOT NUMBER:** 102FTS1122

COMPOUND: Sodium 1H,1H,2H,2H-perfluorododecanesulfonate

STRUCTURE: **CAS #:** 108026-35-3



MOLECULAR FORMULA:	$C_{12}H_4F_{21}SO_3Na$	**MOLECULAR WEIGHT:**	650.18
CONCENTRATION:	50.0 ± 2.5 µg/mL (Na salt)	**SOLVENT(S):**	Methanol
	48.3 ± 2.4 µg/mL (10:2FTS acid)		
	48.2 ± 2.4 µg/mL (10:2FTS anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/01/2022		
EXPIRY DATE: (mm/dd/yyyy)	12/01/2027		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/09/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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BATTELLE
It can be done

BDO Id: 230608-04

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: N-MeFOSA-M
Vendor: Wellington Laboratories
Catalogue No: NMeFOSA1122M
Type: Solution
Lot No: NMeFOSA1122M
Quantity: 2 ea ampoules **% Moisture:**
Description: N-MeFOSA-M

Received: 6/8/2023
Custodian: Kinsman, Nathaniel
Expires: 11/11/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
N-methylperfluoro-1-octanesulfonami	31506-32-8	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-MeFOSA-M
COMPOUND: N-Methylperfluoro-1-octanesulfonamide

LOT NUMBER: NMeFOSA1122M

STRUCTURE:

CAS #: 31506-32-8

MOLECULAR FORMULA:	$C_9H_4F_{17}NO_2S$	**MOLECULAR WEIGHT:**	513.17
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	11/11/2022		
EXPIRY DATE: (mm/dd/yyyy)	11/11/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/25/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

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BATTELLE

It can be done

BDO Id: 230608-05

ea ent eceipt eport

Approved: ☐ **Aut ori ed** ☐

Name:	N-EtFOSA-M	**Received:**	6/8/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	NEtFOSA0123M	**Expires:**	1/18/2028
Type:	Solution	**Consumed:**	
Lot No:	NEtFOSA0123M	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	N-EtFOSA-M		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
N-ethylperfluoro-1-octanesulfonamid	4151-50-2	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230608-05

WELLINGTON LABORATORIES

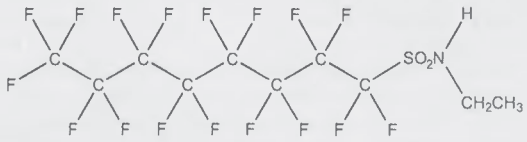
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSA-M
COMPOUND: N-Ethylperfluoro-1-octanesulfonamide

LOT NUMBER: NEtFOSA0123M

STRUCTURE:

CAS #: 4151-50-2



MOLECULAR FORMULA:	$C_{10}H_6F_{17}NO_2S$	**MOLECULAR WEIGHT:**	527.20
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	01/18/2023		
EXPIRY DATE: (mm/dd/yyyy)	01/18/2028		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: _____ **Date:** 01/24/2023
(mm/dd/yyyy)
B.G. Chittim, General Manager

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BDO Id: 230608-06

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name:	N-MeFOSE-M	**Received:**	6/8/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	NMeFOSE1122M	**Expires:**	12/22/2027
Type:	Solution	**Consumed:**	
Lot No:	NMeFOSE1122M	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	N-MeFOSE-M		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
2-(N-methylperfluoro-1-octanesulfon	24448-09-7	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230608-06

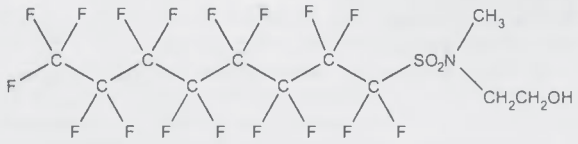
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSE-M **LOT NUMBER:** NMeFOSE1122M

COMPOUND: 2-(N-Methylperfluoro-1-octanesulfonamido)ethanol

STRUCTURE: **CAS #:** 24448-09-7



MOLECULAR FORMULA:	$C_{11}H_8F_{17}NO_3S$	**MOLECULAR WEIGHT:**	557.22
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/22/2022 (HRGC/LRMS) 11/25/2022 (LC/MS)		
EXPIRY DATE: (mm/dd/yyyy)	12/22/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS Data (Full Scan and Mass Spectrum)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- In order to see the molecular ion (adduct free), the LC mobile phase should be free of ammonium acetate buffer.

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Certified By: _____ **Date:** 01/17/2023 (mm/dd/yyyy)

B.G. Chittim, General Manager

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BDO Id: 230608-07

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: N-EtFOSE-M
Vendor: Wellington Laboratories
Catalogue No: NEtFOSE1222M
Type: Solution
Lot No: NEtFOSE1222M
Quantity: 1 ea ampoule **% Moisture:**
Description: N-EtFOSE-M

Received: 6/8/2023
Custodian: Kinsman, Nathaniel
Expires: 12/22/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
2-(N-ethylperfluoro-1-octanesulfona	1691-99-2	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230608-07

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSE-M **LOT NUMBER:** NEtFOSE1222M

COMPOUND: 2-(N-Ethylperfluoro-1-octanesulfonamido)ethanol

STRUCTURE: **CAS #:** 1691-99-2

MOLECULAR FORMULA:	$C_{12}H_{10}F_{17}NO_3S$	**MOLECULAR WEIGHT:**	571.25
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/22/2022 (HRGC/LRMS) 11/25/2022 (LC/MS)		
EXPIRY DATE: (mm/dd/yyyy)	12/22/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS Data (Full Scan and Mass Spectrum)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- In order to see the molecular ion (adduct free), the LC mobile phase should be free of ammonium acetate buffer.

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Certified By: _____ **Date:** 12/29/2022 (mm/dd/yyyy)

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BATTELLE
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BDO Id: 230608-08

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: PF4OPeA
Vendor: Wellington Laboratories
Catalogue No: PF4OPeA0722
Type: Solution
Lot No: PF4OPeA0722
Quantity: 1 ea ampoule **% Moisture:**
Description: PF4OPeA

Received: 6/8/2023
Custodian: Kinsman, Nathaniel
Expires: 8/2/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
Perfluoro-3-methoxypropanoic acid	377-73-1	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

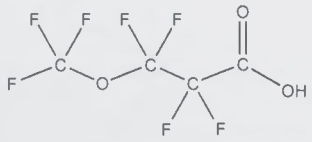
Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

230608-08

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PF4OPeA	**LOT NUMBER:**	PF4OPeA0722
COMPOUND:	Perfluoro-4-oxapentanoic acid		
SYNONYM:	Perfluoro-3-methoxypropanoic acid (PFMPA)		
STRUCTURE:		**CAS #:**	377-73-1



MOLECULAR FORMULA:	$C_4HF_7O_3$	**MOLECULAR WEIGHT:**	230.04
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	08/02/2022		
EXPIRY DATE: (mm/dd/yyyy)	08/02/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/15/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

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BATTELLE
It can be done

BDO Id: 230608-09

ea ent eceipt eport

Approved: ☐ **Aut ori ed** ☐

Name:	3,6-OPFHpA	**Received:**	6/8/2023
Vendor:	Wellington Laboratories	**Custodian:**	Kinsman, Nathaniel
Catalogue No:	36OPFHpA0323	**Expires:**	3/29/2028
Type:	Solution	**Consumed:**	
Lot No:	36OPFHpA0323	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	3,6-OPFHpA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
nonafluoro-3,6-dioxaheptanoic acid	151772-58-6	50.0000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	nonafluoro-3,6-dioxaheptanoic acid	as acid

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230608-09

WELLINGTON LABORATORIES

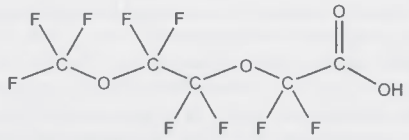
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 3,6-OPFHpA
COMPOUND: Perfluoro-3,6-dioxaheptanoic acid

LOT NUMBER: 36OPFHpA0323

STRUCTURE:

CAS #: 151772-58-6



MOLECULAR FORMULA: $C_5HF_9O_4$
CONCENTRATION: 50.0 ± 2.5 µg/mL

MOLECULAR WEIGHT: 296.04
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 03/29/2023
EXPIRY DATE: (mm/dd/yyyy) 03/29/2028
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/11/2023
(mm/dd/yyyy)
B.G. Chittim, General Manager

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BDO Id: 230608-10

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Approved: ☐ Aut ori ed ☐

Name: PF5OHxA
Vendor: Wellington Laboratories
Catalogue No: PF5OHxA0722
Type: Solution
Lot No: PF5OHxA0722
Quantity: 1 ea ampoule **% Moisture:**
Description: PF5OHxA

Received: 6/8/2023
Custodian: Kinsman, Nathaniel
Expires: 8/2/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
Perfluoro-4-methoxybutanoic acid	863090-89-5	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

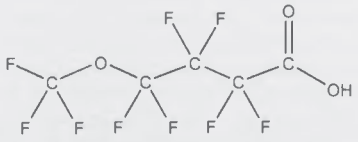
Authorized by: _____ **Authorized on:** _____

230608-10

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PF5OHxA	**LOT NUMBER:**	PF5OHxA0722
COMPOUND:	Perfluoro-5-oxahexanoic acid		
SYNONYM:	Perfluoro-4-methoxybutanoic acid (PFMBA)		
STRUCTURE:		**CAS #:**	863090-89-5



MOLECULAR FORMULA:	$C_5HF_9O_3$	**MOLECULAR WEIGHT:**	280.05
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	08/02/2022		
EXPIRY DATE: (mm/dd/yyyy)	08/02/2027		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/26/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

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BATTELLE
It can be done

BDO Id: 230608-11

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: PFHxDA
Vendor: Wellington Laboratories
Catalogue No: PFHxDA1222
Type: Solution
Lot No: PFHxDA1222
Quantity: 1 ea ampoule **% Moisture:**
Description: PFHxDA

Received: 6/8/2023
Custodian: Kinsman, Nathaniel
Expires: 12/6/2027
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
Perfluoro-n-hexadecanoic acid	67905-19-5	50.0000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	Perfluoro-n-hexadecanoic acid	as acid

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

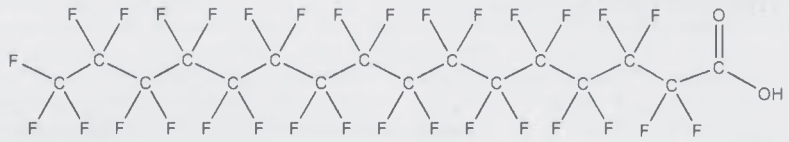
230608-11

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxDA
LOT NUMBER: PFHxDA1222
COMPOUND: Perfluoro-n-hexadecanoic acid

STRUCTURE:
CAS #: 67905-19-5



MOLECULAR FORMULA: $C_{16}HF_{31}O_2$
MOLECULAR WEIGHT: 814.13
CONCENTRATION: 50.0 ± 2.5 µg/mL
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/06/2022
EXPIRY DATE: (mm/dd/yyyy) 12/06/2027
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/09/2022 (mm/dd/yyyy)
B.G. Chittim, General Manager

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It can be done

BDO Id: 230608-12

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: PFODA
Vendor: Wellington Laboratories
Catalogue No: PFODA0523
Type: Solution
Lot No: PFODA0523
Quantity: 1 ea ampoule **% Moisture:**
Description: PFODA

Received: 6/8/2023
Custodian: Kinsman, Nathaniel
Expires: 5/30/2028
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
Perfluoro-n-octadecanoic acid	16517-11-6	50.0000	98.00	--	--	☐			1

Total Analytes: 1

Notes:

	Analyte:	Comment:
1	Perfluoro-n-octadecanoic acid	as acid

Approved by: _____ **Approved on:** _____
Authorized by: _____ **Authorized on:** _____

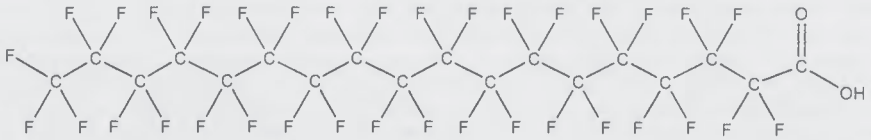
230608-12

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFODA
LOT NUMBER: PFODA0523
COMPOUND: Perfluoro-n-octadecanoic acid

STRUCTURE:
CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
MOLECULAR WEIGHT: 914.14
CONCENTRATION: 50.0 ± 2.5 µg/mL
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/30/2023
EXPIRY DATE: (mm/dd/yyyy) 05/30/2028
RECOMMENDED STORAGE: Store ampoule at ambient temperature in a dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- The solubility of this product in methanol is very sensitive to storage conditions and solvent composition. The stated validity period applies to the sealed ampoules stored at ambient temperature.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/02/2023 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

BATTELLE
It can be done

BDO Id: 230714-01

ea ent eceipt eport

Approved: ☐ **Aut ori ed** ☐

Name:	13C3-PFBA	**Received:**	7/14/2023
Vendor:	Wellington Laboratories	**Custodian:**	Harnden, Kelsey
Catalogue No:	M3PFBA	**Expires:**	6/15/2028
Type:	Solution	**Consumed:**	
Lot No:	M3PFBA0623	**Stored In:**	LC Laboratory #2 - R0123
Quantity:	1 ea ampoule **% Moisture:**		
Description:	M3PFBA		

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C3-PFBA	BDO-2231	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230714-01

WELLINGTON LABORATORIES

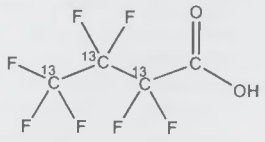
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M3PFBA
COMPOUND: Perfluoro-n-(2,3,4-$^{13}C_3$)butanoic acid

LOT NUMBER: M3PFBA0623

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_3{}^{12}CHF_7O_2$
CONCENTRATION: 50.0 ± 2.5 µg/mL

MOLECULAR WEIGHT: 217.02
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 06/15/2023
EXPIRY DATE: (mm/dd/yyyy) 06/15/2028
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C (2,3,4-$^{13}C_3$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~0.2% of perfluoro-n-($^{13}C_3$)propanoic acid, and also contains ~1.0% of perfluoro-n-($^{13}C_4$)butanoic acid due to the naturally occurring isotopic abundance of ^{13}C in the unlabelled carbon atom.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/27/2023 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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BDO Id: 230714-02

ea ent eceipt eport

Approved: ☐ Aut ori ed ☐

Name: 13C2-PFOA
Vendor: Wellington Laboratories
Catalogue No: M2PFOA0523
Type: Solution
Lot No: M2PFOA0523
Quantity: 1 ea ampoule **% Moisture:**
Description: M2PFOA0523

Received: 7/14/2023
Custodian: Kinsman, Nathaniel
Expires: 5/15/2028
Consumed:
Stored In: LC Laboratory #2 - R0123

Analyte:	CAS No:	Concentration (ug/mL):	Purity:	Density:	Density Units:	Cert	Cert Val:	Lower Limit:	Upper Limit:
13C2-PFOA	BDO-2107	50.0000	98.00	--	--	☐			

Total Analytes: 1

Notes:

Approved by: _____ **Approved on:** _____

Authorized by: _____ **Authorized on:** _____

230714-02

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFOA	**LOT NUMBER:**	M2PFOA0523
COMPOUND:	Perfluoro-n-(1,2-$^{13}C_2$)octanoic acid		
STRUCTURE:		**CAS #:**	864071-08-9

MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6HF_{15}O_2$	**MOLECULAR WEIGHT:**	416.05
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	05/15/2023		
EXPIRY DATE: (mm/dd/yyyy)	05/15/2028		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/25/2023 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

ACCREDITATIONS

Accrediting Authority	Laboratory ID
U.S. Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP)	91667
State of Florida Department of Health	E87856
State of New York Department of Health	12105
State of Washington Department of Ecology	C1050
State of Maine	MA00056
State of Vermont	VT 87856
State of New Hampshire	2137
Commonwealth of Pennsylvania Department of Environmental Protection	68-05687
State of Alaska Department of Environmental Conservation	19-005
State of Rhode Island	E87856
State of California	3045

Current certificates and lists of accredited parameters are available upon request.

Sample Preparation

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BATTELLE - NORWELL OPERATIONS
SAMPLE PREPARATION RECORDS

Pro ect Title s	Pro ect No s
CTO-4117: Northwest PFAS Investigation	G25161. 1. .0026.00000 1

3-1036

CTO- 11 : NB eyport PFAS in Solids IDW SO

SOP Numbers (see workplan for modifications)

ExtractionSOP No. 5-370

This Batch Contains The Following Samples:
DO705P -FS
DO706LCS-FS
D7904-FS
D7905-FS

Laboratory Preparation Records
COMPLETE AND VALIDATED

Prep Task Leader: Zachary Dreiker

Approved y:	Date	Initials
Vincent Urso	08/23/2023	VU

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BATTELLE - NORWELL OPERATIONS
SAMPLE IDENTIFICATION PA E

Pro ect Title s	Pro ect No s
CTO-4117: Northwest PFAS Investigation	G25161.X1.XX.0026.00001

3-1036

CTO- 11 : NB eyport PFAS in Solids IDW SO

Sample ID	Description
DO705PB-FS	Procedural Blank - Ottawa Sand (220520-01)
DO706LCS-FS	Laboratory Control Sample - Ottawa Sand (220520-01)
D7904-FS	NBKK-B76-IDW01-SO-081523
D7905-FS	NBKK-B76-IDW02-SO-081623

Samples Assigned By: Matt Schumitz

Date : August 17, 2023
Due Date : August 24, 2023

Comments:

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BATTELLE - NORWELL OPERATIONS
SAMPLE CUSTOD LO

Pro ect Title s	Pro ect No s
CTO-4117: Northwest PFAS Investigation	G25161.X1.XX.0026.000001

3-1036

CTO- 11 : NB eyport PFAS in Solids IDW

SO

Requested On/By:	08/21/2023 ZMD	**Purpose:**	Sample Preparation
Relinquished On/By:	08/21/2023 ZMD	**Last Activity:**	Return

Accepted On/By:	08/21/2023 HB	**Returned On/To:**	08/21/2023 MDS
Stored In Facility:	Sample Preparation	**Returned To Facility:**	Custody: NA
Stored Until	08/21/2023		
Stored Comment:	NA	**Returned Comment:**	NA

No.	BDO-ID:	Ctrs	*	Condition:	Custody Comment:
1	D7904	1	--	Intact	NA
2	D7905	1	--	Intact	NA

Total Samples 2 * "C" = Consumed Container

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BATTELLE - NORWELL OPERATIONS
ELECTRONIC DR WEI HT DETERMINATION

Pro ect Title s
CTO-4117: Northwest PFAS Investigation

Pro ect No s
G25161. 1. .0026.00000 1

3-1036

CTO- 11 : NB eyport PFAS in Solids IDW SO

Sample ID:	Ctrs.		Tare t. (g)	Aliquot t. (g)	Dry t. (g)	Sample et t. (g)	Dry t.	Moisture	Sample Dry t. (g)
DO705P -FS	NA		NA	NA	NA	5.01	100.00	0.00	5.01
DO706LCS-FS	NA		NA	NA	NA	5.02	100.00	0.00	5.02
D7904-FS	1		0.79	11.82	10.40	5.74	87.13	12.87	5.00
D7905-FS	1		0.81	21.88	16.96	6.53	76.65	23.35	5.01

Percent Dry t ( ) (Sample Dry t. (g) - Tare t. (g))/(Aliquot et t. (g) - Tare t. (g)) 100
Sample Dry t. ( ) (Sample et t. (g) (Percent Dry t./100)
Sample homogenized per SOP requirements

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
ELECTRONIC DR WEI HT DETERMINATION

Pro ect Title s
CTO-4117: Northwest PFAS Investigation

Pro ect No s
G25161. 1. .0026.000001

3-1036

CTO- 11 : NB eyport PFAS in Solids IDW SO

Sample ID:	Ctrs.		Tare t. (g)	Aliquot t. (g)	Dry t. (g)	Sample et t. (g)	Dry t.	Moisture	Sample Dry t. (g)

Task: Wet Weight

BNO-ID:	Date/Initials:	Battelle-ID:
D7904-FS	08/21/2023 HB	BAL-007
D7905-FS	08/21/2023 HB	BAL-007
DO705PB-FS	08/21/2023 HB	BAL-007
DO706LCS-FS	08/21/2023 HB	BAL-007

Task: Tare Weight

BNO-ID:	Date/Initials:	Battelle-ID:
D7904-FS	08/18/2023 ZMD	BAL-007
D7905-FS	08/18/2023 ZMD	BAL-007
DO705PB-FS	--	--
DO706LCS-FS	--	--

Task: Aliquot Wet Weight

BNO-ID:	Date/Initials:	Battelle-ID:
D7904-FS	08/18/2023 ZMD	BAL-007
D7905-FS	08/18/2023 ZMD	BAL-007
DO705PB-FS	--	--
DO706LCS-FS	--	--

Task: Aliquot Dry Weight

BNO-ID:	Date/Initials:	Battelle-ID:
D7904-FS	08/21/2023 HB	BAL-007
D7905-FS	08/21/2023 HB	BAL-007
DO705PB-FS	--	--
DO706LCS-FS	--	--

Percent Dry t ( ) (Sample Dry t. (g) - Tare t. (g))/(Aliquot et t. (g) - Tare t. (g)) 100
Sample Dry t. ( ) (Sample et t. (g) (Percent Dry t./100)
Sample homogenized per SOP requirements

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
SURRO ATE SPI E FORM

Pro ect Title s
CTO-4117: Northwest PFAS Investigation

Pro ect No s
G25161.X1.XX.0026.000001

3-1036

CTO- 11 : NB eyport PFAS in Solids IDW SO

Sample ID	Standard ID	Type	ial No.	ol Added (uL)	Date Spiked Spiked By	Witn d By	Comment
DO705PB-FS	LX92	SIS	4	50	08 21 23 B	JS	NA
DO706LCS-FS	L 91	LCS/MS	1	125	08/21/23 H	JS	NA
DO706LCS-FS	L 92	SIS	4	50	08/21/23 H	JS	NA
D7904-FS	L 92	SIS	4	50	08/21/23 H	JS	NA
D7905-FS	L 92	SIS	4	50	08/21/23 H	JS	NA

Syringes/Pipettes Used:

Std ID	Type	Syr/Pip
L 91	Pipette	909301860
L 92	Pipette	814659662

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BATTELLE - NORWELL OPERATIONS
SAMPLE E TRACTION FORM

Pro ect Title s
CTO-4117: Northwest PFAS Investigation

Pro ect No s
G25161.X1.XX.0026.000001

3-1036

CTO- 11 : NB eyport PFAS in Solids IDW SO

Sample ID	1st traction	2nd traction	3rd traction	Comment
DO705PB-FS	08 21 23 B	08 21 23 B	NA	NA
DO706LCS-FS	08 21 23 B	08 21 23 B	NA	NA
D7904-FS	08 21 23 B	08 21 23 B	NA	NA
D7905-FS	08 21 23 B	08 21 23 B	NA	NA

Solvents/Reagent Preparations:

Name	ID	Expires	Lot No	Procedure	Comments
0.3% NH3OH in Methanol	RP-230821-5	09/21/23	A0443371	1 mL NH3OH and 99 mL MEOH for each 100 mL prepared	
0.3% NH3OH in Methanol	RP-230821-5	09/21/23	224253	1 mL NH3OH and 99 mL MEOH for each 100 mL prepared	

Solvents/Reagents:

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It can be done

BATTELLE - NORWELL OPERATIONS
COLUMN FRACTIONATION FORM

Pro ect Title s
CTO-4117: Northwest PFAS Investigation

Pro ect No s
G25161. 1. .0026.00000 1

3-1036

CTO- 11 : NB eyport PFAS in Solids IDW SO

tract Id	Date	Init.	Conc. ID	Turbo °C	Turbo PSI	D °C	Comments
DO705P -FS(0)	08/21/23	H	NA	NA	NA	NA	NA
DO706LCS-FS(0)	08/21/23	H	NA	NA	NA	NA	NA
D7904-FS(0)	08/21/23	H	NA	NA	NA	NA	NA
D7905-FS(0)	08/21/23	H	NA	NA	NA	NA	NA

Column Diameter: 13 mm **Procedure Comment:**

Elution Volume: 5 mL

Solvents

Reagents

Reagent Prep	Weight g	Name	Expires	Lot No	Procedure
RP-230821-21	Not Measured	1% NH3OH in Methanol	09/21/23	A0443371	3.3 mL NH3OH and 97 each 100 mL prepared
RP-230821-21	Not Measured	1% NH3OH in Methanol	09/21/23	224253	3.3 mL NH3OH and 97 each 100 mL prepared
RP-230821-25	Not Measured	Pre-packed SPE Carbon Column	08/21/23	165671	
RP-230821-25	Not Measured	Pre-packed SPE Carbon Column	08/21/23	X1123-TB/1256	

Fractions

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E TRACT CONCENTRATION

Pro ect Title s	Pro ect No s
CTO-4117: Northwest PFAS Investigation	G25161.X1.XX.0026.000001

3-1036

CTO- 11 : NB eyport PFAS in Solids IDW SO

SE - Solvent Exchanged
R - Reconstituted

Solvents / Reagents

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BATTELLE - NORWELL OPERATIONS
INTERNAL STANDARD SPI IN FORM

Pro ect Title s
CTO-4117: Northwest PFAS Investigation

Pro ect No s
G25161. 1. .0026.00000 1

3-1036

CTO- 11 : NB eyport PFAS in Solids IDW SO

N/A Fraction

tract Id	Extr. Vol. (uL)	Added (uL)	Std. Id	Accm . (uL)	Vial No.	Pre Inj. Vol. (uL)	Final Dilution	Date Spiked/ Spiked y	itn d y
DO705P -FS(0)	4950	50	LZ07	50	3	5000	1.000	08/21/23 H	JS
DO706LCS-FS(0)	4950	50	LZ07	50	3	5000	1.000	08/21/23 H	JS
D7904-FS(0)	4950	50	LZ07	50	3	5000	1.000	08/21/23 H	JS
D7905-FS(0)	4950	50	LZ07	50	3	5000	1.000	08/21/23 H	JS

Syringes/Pipettes Used:

Std ID	Type	Syr/Pip
LZ07	Pipette	C202360925

- Final Dilution is any HPLC, dilutions, or other manipulation
- Pre Injection Volume (PIV) includes any RIS spikes.

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PREPARATION E TRACT SPLIT FORM

Pro ect Title s
CTO-4117: Northwest PFAS Investigation

Pro ect No s
G25161.X1.XX.0026.000001

3-1036

CTO- 11 : NB eyport PFAS in Solids IDW

SO

tract Name			tract Date	Source Name		Initial tract ol (uL)	tract Split	tract Split	Total Dilution	Date Initials
DO705PB-FS	0	--	8 21 2023 9:27:00 AM	NA		NA	NA	1.000	1.000	08 21 23 B
DO706LCS-FS	0	--	8 21 2023 9:27:00 AM	NA		NA	NA	1.000	1.000	08 21 23 B
D7904-FS	0	--	8 21 2023 9:27:00 AM	NA		NA	NA	1.000	1.000	08 21 23 B
D7905-FS	0	--	8 21 2023 9:27:00 AM	NA		NA	NA	1.000	1.000	08 21 23 B

Total Oil Sample olume (uL) Ali uot olume (uL) Ali uot Weight (mg)
Dilution Factor Sample olume (uL) Ali ot olume (uL)) Prior Dilution Factor
- C tract is Consumed

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It can be done

BATTELLE - NORWELL OPERATIONS
E TRACT - INSTRUMENT FACILIT CUSTOD PA E

Pro ect Title s	Pro ect No s
CTO-4117: Northwest PFAS Investigation	G25161.X1.X X.0026.00000 1

3-1036

CTO- 11 : NB eyport PFAS in Solids IDW SO

Purpose:	LC-MS/MS TRANSFER	**Last Activity:**	Prep->Inst
Relinquished On/By:	Aug 22 2023 10:05AM TN	**Received On/By:**	Aug 22 2023 10:05AM VU
Relinquished From:	Sample Preparation: NA	**Received Location:**	LC Laboratory #2: NA
Relinquish Comment:	NA	**Received Comment:**	NA

No.	BDO-ID:	PIV:	DF:	Condition:	Custody Comment:
1	DO705PB-FS(0)	5000	1	Intact	NA
2	DO706LCS-FS(0)	5000	1	Intact	NA
3	D7904-FS(0)	5000	1	Intact	NA
4	D7905-FS(0)	5000	1	Intact	NA

Total Extracts: 4

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It can be done

BATTELLE - NORWELL OPERATIONS
SAMPLE SPECIFIC COMMENTS

Pro ect Title s
CTO-4117: Northwest PFAS Investigation

Pro ect No s
G25161. 1. .0026.00000 1

3-1036

CTO- 11 : NB eyport PFAS in Solids IDW SO

Sample ID:	Comment:	Date/Initials:
DO705P -FS	pH was adjusted to be between 6 and 8.	08/21/23 H
DO705P -FS	SPE started at 12:23 PM, on manifold 13, and ended at 2:05 PM.	08/21/23 H
DO706LCS-FS	pH was adjusted to be between 6 and 8.	08/21/23 H
DO706LCS-FS	SPE started at 12:23 PM, on manifold 13, and ended at 2:31 PM.	08/21/23 H
D7904-FS	pH was adjusted to be between 6 and 8.	08/21/23 H
D7904-FS	SPE started at 12:23 PM, on manifold 13, and ended at 3:24 PM.	08/21/23 H
D7905-FS	pH was adjusted to be between 6 and 8.	08/21/23 H
D7905-FS	SPE started at 12:23 PM, on manifold 13, and ended at 2:53 PM.	08/21/23 H

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
MISCELLANEOUS DOCUMENTATION FORM

Pro ect Title s	Pro ect No s
CTO-4117: Northwest PFAS Investigation	G25161.X1.XX.0026.000001

3-1036

CTO- 11 : NB eyport PFAS in Solids IDW SO

Entered By:	**On:**

Task Leader Approval:	**On:**
SupervisorApproval:	**On:**
PM Approval:	**On:**

Analytical Calibrations

BATTELLE

Sequence Report

Created with Analyst Reporter
Printed: 23/08/2023 9:43:52 AM

Vial	Laboratory Sample ID	Client Sample ID	Acquisition Date	Acquisition Method	Data File	
3	LZ83	L1	8/22/2023 5:41:38 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
4	LZ84	L2	8/22/2023 5:57:41 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
5	LZ85	L3	8/22/2023 6:13:44 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
6	LZ86	L4	8/22/2023 6:29:47 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
7	LZ87	L5	8/22/2023 6:45:50 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
8	LZ88	L6	8/22/2023 7:01:53 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
9	LZ89	L7	8/22/2023 7:17:57 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
10	LZ90	L8	8/22/2023 7:33:58 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
11	LZ91 IB	Instrument Blank	8/22/2023 7:49:57 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
12	LZ92 ICC	ICC	8/22/2023 8:05:55 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
13	LY28 BR		8/22/2023 8:21:56 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
~~14~~	~~D7902-FS(0)~~		~~8/22/2023 8:38:01 PM~~	~~5-369_ACN.dam~~	~~AD_08222023_5-369.wiff~~	1
~~15~~	~~D7903-FS(0)~~		~~8/22/2023 8:54:05 PM~~	~~5-369_ACN.dam~~	~~AD_08222023_5-369.wiff~~	↓
16	4%		8/22/2023 9:10:10 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
17	DO705PB-FS(0)	Procedural Blank	8/22/2023 9:26:15 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
18	DO706LCS-FS(0)	Laboratory Control Sample	8/22/2023 9:42:20 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
19	D7904-FS(0)	NBKK-B76-IDW01-SO-081523	8/22/2023 9:58:24 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
20	D7905-FS(0)	NBKK-B76-IDW02-SO-081623	8/22/2023 10:14:27 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
~~21~~	~~D7904-FS(0)~~	~~NBKK-B76-IDW01-SO-081523~~	~~8/22/2023 10:30:30 PM~~	~~5-369_ACN.dam~~	~~AD_08222023_5-369.wiff~~	2
~~22~~	~~D7905-FS(0)~~	~~NBKK-B76-IDW02-SO-081623~~	~~8/22/2023 10:46:34 PM~~	~~5-369_ACN.dam~~	~~AD_08222023_5-369.wiff~~	↓
23	4%		8/22/2023 11:02:37 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	
24	LZ87 CCV	CCV	8/22/2023 11:18:41 PM	5-369_ACN.dam	AD_08222023_5-369.wiff	

1 - Samples from another batch; not reported with this one. VU 23AUG2023
2 - No data reported from this injection. VU 23AUG2023

Analyte Name	PFHxA_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	313.0 / 269.0	**Result Table**	23-1036
Internal Standard	13C5-PFHxA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.25460 x + -0.01012 (r = 0.99925) (weighting: 1 / x) r^2:0.9985

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.150	119.7
4	LZ84	L2	True	0.250	0.269	107.4
5	LZ85	L3	True	0.500	0.474	94.9
6	LZ86	L4	True	1.000	0.949	94.9
7	LZ87	L5	True	2.500	2.156	86.3
8	LZ88	L6	True	10.000	9.322	93.2
9	LZ89	L7	True	25.000	25.742	103.0
10	LZ90	L8	True	50.000	50.312	100.6

Analyte Name	PFHxA_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	313.0 / 118.9	**Result Table**	23-1036
Internal Standard	13C5-PFHxA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.02872 x + -6.71435e-5 (r = 0.99862) (weighting: 1 / x) r^2:0.9972

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.085	67.8
4	LZ84	L2	True	0.250	0.321	128.6
5	LZ85	L3	True	0.500	0.550	110.0
6	LZ86	L4	True	1.000	1.041	104.1
7	LZ87	L5	True	2.500	2.353	94.1
8	LZ88	L6	True	10.000	9.046	90.5
9	LZ89	L7	True	25.000	26.511	106.0
10	LZ90	L8	True	50.000	49.468	98.9

Analyte Name	PFHpA_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	363.1 / 319.0	**Result Table**	23-1036
Internal Standard	13C4-PFHpA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.17601 x + -0.00608 (r = 0.99943) (weighting: 1 / x) r^2:0.9989

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.148	118.3
4	LZ84	L2	True	0.250	0.256	102.3
5	LZ85	L3	True	0.500	0.491	98.2
6	LZ86	L4	True	1.000	0.950	95.0
7	LZ87	L5	True	2.500	2.230	89.2
8	LZ88	L6	True	10.000	9.721	97.2
9	LZ89	L7	True	25.000	24.296	97.2
10	LZ90	L8	True	50.000	51.283	102.6

Analyte Name	PFHpA_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	363.1 / 169.0	**Result Table**	23-1036
Internal Standard	13C4-PFHpA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.01543 x + -6.35374e-5 (r = 0.99850) (weighting: 1 / x) r^2:0.9970

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.128	102.1
4	LZ84	L2	True	0.250	0.291	116.6
5	LZ85	L3	True	0.500	0.472	94.5
6	LZ86	L4	True	1.000	1.016	101.6
7	LZ87	L5	True	2.500	2.180	87.2
8	LZ88	L6	True	10.000	10.130	101.3
9	LZ89	L7	True	25.000	23.204	92.8
10	LZ90	L8	True	50.000	51.953	103.9

Analyte Name	PFOA_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	413.0 / 369.0	**Result Table**	23-1036
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.02130 x + -0.00334 (r = 0.99862) (weighting: 1 / x) r^2:0.9972

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.137	109.2
4	LZ84	L2	True	0.250	0.252	100.9
5	LZ85	L3	True	0.500	0.511	102.3
6	LZ86	L4	True	1.000	0.922	92.2
7	LZ87	L5	True	2.500	2.363	94.5
8	LZ88	L6	True	10.000	10.536	105.4
9	LZ89	L7	True	25.000	23.099	92.4
10	LZ90	L8	True	50.000	51.555	103.1

Analyte Name	PFOA_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	413.0 / 169.0	**Result Table**	23-1036
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.03604 x + 1.04413e-4 (r = 0.99744) (weighting: 1 / x) r^2:0.9949

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.125	100.0
4	LZ84	L2	True	0.250	0.242	96.8
5	LZ85	L3	True	0.500	0.460	92.0
6	LZ86	L4	True	1.000	1.113	111.3
7	LZ87	L5	True	2.500	2.511	100.5
8	LZ88	L6	True	10.000	10.637	106.4
9	LZ89	L7	True	25.000	22.263	89.1
10	LZ90	L8	True	50.000	52.024	104.1

Analyte Name	PFNA_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	463.0 / 419.0	**Result Table**	23-1036
Internal Standard	13C9-PFNA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.10483 x + -0.00492 (r = 0.99932) (weighting: 1 / x) r^2:0.9986

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.153	122.4
4	LZ84	L2	True	0.250	0.272	108.8
5	LZ85	L3	True	0.500	0.469	93.9
6	LZ86	L4	True	1.000	0.917	91.7
7	LZ87	L5	True	2.500	2.115	84.6
8	LZ88	L6	True	10.000	9.554	95.5
9	LZ89	L7	True	25.000	25.688	102.8
10	LZ90	L8	True	50.000	50.207	100.4

Analyte Name	PFNA_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	463.0 / 219.0	**Result Table**	23-1036
Internal Standard	13C9-PFNA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.16172 x + -7.56883e-4 (r = 0.99955) (weighting: 1 / x) r^2:0.9991

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.095	75.7
4	LZ84	L2	True	0.250	0.322	129.0
5	LZ85	L3	True	0.500	0.528	105.6
6	LZ86	L4	True	1.000	0.912	91.3
7	LZ87	L5	True	2.500	2.528	101.1
8	LZ88	L6	True	10.000	9.526	95.3
9	LZ89	L7	True	25.000	25.624	102.5
10	LZ90	L8	True	50.000	49.840	99.7

Analyte Name	PFDA_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	512.9 / 469.0	**Result Table**	23-1036
Internal Standard	13C6-PFDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.54712 x + -0.00398 (r = 0.99977) (weighting: 1 / x) r^2:0.9995

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.137	109.9
4	LZ84	L2	True	0.250	0.232	93.0
5	LZ85	L3	True	0.500	0.516	103.1
6	LZ86	L4	True	1.000	1.027	102.7
7	LZ87	L5	True	2.500	2.375	95.0
8	LZ88	L6	True	10.000	9.555	95.6
9	LZ89	L7	True	25.000	24.880	99.5
10	LZ90	L8	True	50.000	50.654	101.3

Analyte Name	PFDA_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	512.9 / 219.0	**Result Table**	23-1036
Internal Standard	13C6-PFDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.01486 x + -1.04420e-4 (r = 0.99825) (weighting: 1 / x) r^2:0.9965

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.200	160.0
4	LZ84	L2	True	0.250	0.168	67.1
5	LZ85	L3	True	0.500	0.411	82.2
6	LZ86	L4	True	1.000	0.886	88.7
7	LZ87	L5	True	2.500	2.311	92.4
8	LZ88	L6	True	10.000	11.279	112.8
9	LZ89	L7	True	25.000	24.310	97.2
10	LZ90	L8	True	50.000	49.810	99.6

Analyte Name	PFUnA_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	563.1 / 519.0	**Result Table**	23-1036
Internal Standard	13C7-PFUnA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.93127 x + -0.00500 (r = 0.99837) (weighting: 1 / x) r^2:0.9967

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.160	128.1
4	LZ84	L2	True	0.250	0.239	95.7
5	LZ85	L3	True	0.500	0.481	96.2
6	LZ86	L4	True	1.000	1.028	102.8
7	LZ87	L5	True	2.500	2.114	84.6
8	LZ88	L6	True	10.000	9.297	93.0
9	LZ89	L7	True	25.000	23.808	95.2
10	LZ90	L8	True	50.000	52.247	104.5

Analyte Name	PFUnA_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	563.1 / 269.1	**Result Table**	23-1036
Internal Standard	13C7-PFUnA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.04195 x + -3.25184e-4 (r = 0.99953) (weighting: 1 / x) r^2:0.9991

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.117	93.8
4	LZ84	L2	True	0.250	0.257	102.8
5	LZ85	L3	True	0.500	0.420	84.0
6	LZ86	L4	True	1.000	1.232	123.2
7	LZ87	L5	True	2.500	2.477	99.1
8	LZ88	L6	True	10.000	9.759	97.6
9	LZ89	L7	True	25.000	24.717	98.9
10	LZ90	L8	True	50.000	50.397	100.8

Analyte Name	PFDoA_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	613.1 / 569.0	**Result Table**	23-1036
Internal Standard	13C2-PFDoA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.01167 x^2 + 0.47658 x + 7.45909e-4 (r = 0.99969) (weighting: 1 / x) r^2:0.9994

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.129	103.3
4	LZ84	L2	True	0.250	0.242	96.7
5	LZ85	L3	True	0.500	0.504	100.8
6	LZ86	L4	True	1.000	1.060	106.0
7	LZ87	L5	True	2.500	2.240	89.6
8	LZ88	L6	True	10.000	10.507	105.1
9	LZ89	L7	True	25.000	24.594	98.4
10	LZ90	L8	True	50.000	50.102	100.2

Analyte Name	PFDoA_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	613.1 / 319.0	**Result Table**	23-1036
Internal Standard	13C2-PFDoA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.00189 x^2 + 0.08349 x + 3.75548e-4 (r = 0.99989) (weighting: 1 / x) r^2:0.9998

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.132	105.9
4	LZ84	L2	True	0.250	0.256	102.2
5	LZ85	L3	True	0.500	0.500	100.0
6	LZ86	L4	True	1.000	0.940	94.0
7	LZ87	L5	True	2.500	2.384	95.4
8	LZ88	L6	True	10.000	10.326	103.3
9	LZ89	L7	True	25.000	24.795	99.2
10	LZ90	L8	True	50.000	50.042	100.1

Analyte Name	PFTrDA_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	663.0 / 619.0	**Result Table**	23-1036
Internal Standard	13C2-PFTeDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.07258 x + 3.31771e-4 (r = 0.99961) (weighting: 1 / x) r^2:0.9992

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.125	99.9
4	LZ84	L2	True	0.250	0.256	102.2
5	LZ85	L3	True	0.500	0.495	99.0
6	LZ86	L4	True	1.000	1.019	101.9
7	LZ87	L5	True	2.500	2.289	91.6
8	LZ88	L6	True	10.000	10.508	105.1
9	LZ89	L7	True	25.000	25.476	101.9
10	LZ90	L8	True	50.000	49.208	98.4

Analyte Name	PFTrDA_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	663.0 / 168.9	**Result Table**	23-1036
Internal Standard	13C2-PFTeDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.02846 x + -1.14382e-4 (r = 0.99899) (weighting: 1 / x) r^2:0.9980

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.128	102.0
4	LZ84	L2	True	0.250	0.284	113.6
5	LZ85	L3	True	0.500	0.405	80.9
6	LZ86	L4	True	1.000	0.986	98.6
7	LZ87	L5	True	2.500	2.447	97.9
8	LZ88	L6	True	10.000	10.515	105.2
9	LZ89	L7	True	25.000	26.285	105.1
10	LZ90	L8	True	50.000	48.326	96.7

Analyte Name	PFTeDA_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	713.0 / 669.0	**Result Table**	23-1036
Internal Standard	13C2-PFTeDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.81870 x + 0.00161 (r = 0.99917) (weighting: 1 / x) r^2:0.9983

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.129	103.4
4	LZ84	L2	True	0.250	0.266	106.5
5	LZ85	L3	True	0.500	0.428	85.7
6	LZ86	L4	True	1.000	1.082	108.2
7	LZ87	L5	True	2.500	2.355	94.2
8	LZ88	L6	True	10.000	9.863	98.6
9	LZ89	L7	True	25.000	26.453	105.8
10	LZ90	L8	True	50.000	48.799	97.6

Analyte Name	PFTeDA_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	713.0 / 168.9	**Result Table**	23-1036
Internal Standard	13C2-PFTeDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.01653 x + 1.61254e-4 (r = 0.99931) (weighting: 1 / x) r^2:0.9986

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.070	56.2
4	LZ84	L2	True	0.250	0.375	149.8
5	LZ85	L3	True	0.500	0.489	97.7
6	LZ86	L4	True	1.000	0.896	89.6
7	LZ87	L5	True	2.500	2.604	104.2
8	LZ88	L6	True	10.000	10.280	102.8
9	LZ89	L7	True	25.000	25.237	101.0
10	LZ90	L8	True	50.000	49.426	98.9

Analyte Name	PFBS_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	298.7 / 79.9	**Result Table**	23-1036
Internal Standard	13C3-PFBS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.19141 x + 0.00127 (r = 0.99958) (weighting: 1 / x) r^2:0.9992

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.135	108.0
4	LZ84	L2	True	0.250	0.215	86.0
5	LZ85	L3	True	0.500	0.465	92.9
6	LZ86	L4	True	1.000	1.072	107.2
7	LZ87	L5	True	2.500	2.513	100.5
8	LZ88	L6	True	10.000	10.589	105.9
9	LZ89	L7	True	25.000	25.351	101.4
10	LZ90	L8	True	50.000	49.036	98.1

Analyte Name	PFBS_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	298.9 / 98.8	**Result Table**	23-1036
Internal Standard	13C3-PFBS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.20660 x + 8.72798e-4 (r = 0.99960) (weighting: 1 / x) r^2:0.9992

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.124	99.1
4	LZ84	L2	True	0.250	0.267	106.7
5	LZ85	L3	True	0.500	0.473	94.6
6	LZ86	L4	True	1.000	1.078	107.8
7	LZ87	L5	True	2.500	2.304	92.2
8	LZ88	L6	True	10.000	10.137	101.4
9	LZ89	L7	True	25.000	24.155	96.6
10	LZ90	L8	True	50.000	50.838	101.7

Analyte Name	PFHxS_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	399.0 / 80.0	**Result Table**	23-1036
Internal Standard	13C3-PFHxS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.01117 x + 7.69077e-4 (r = 0.99939) (weighting: 1 / x) r^2:0.9988

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.115	91.8
4	LZ84	L2	True	0.250	0.258	103.2
5	LZ85	L3	True	0.500	0.523	104.5
6	LZ86	L4	True	1.000	1.046	104.6
7	LZ87	L5	True	2.500	2.541	101.6
8	LZ88	L6	True	10.000	9.576	95.8
9	LZ89	L7	True	25.000	23.951	95.8
10	LZ90	L8	True	50.000	51.366	102.7

Analyte Name	PFHxS_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	399.0 / 99.0	**Result Table**	23-1036
Internal Standard	13C3-PFHxS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.37235 x + 2.09541e-4 (r = 0.99885) (weighting: 1 / x) r^2:0.9977

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.111	89.0
4	LZ84	L2	True	0.250	0.229	91.6
5	LZ85	L3	True	0.500	0.558	111.7
6	LZ86	L4	True	1.000	1.127	112.7
7	LZ87	L5	True	2.500	2.320	92.8
8	LZ88	L6	True	10.000	9.862	98.6
9	LZ89	L7	True	25.000	26.665	106.7
10	LZ90	L8	True	50.000	48.502	97.0

Analyte Name	PFOS_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	498.9 / 79.9	**Result Table**	23-1036
Internal Standard	13C8-PFOS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.63345 x + 0.00560 (r = 0.99876) (weighting: 1 / x) r^2:0.9975

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.125	100.2
4	LZ84	L2	True	0.250	0.214	85.5
5	LZ85	L3	True	0.500	0.572	114.5
6	LZ86	L4	True	1.000	1.063	106.3
7	LZ87	L5	True	2.500	2.353	94.1
8	LZ88	L6	True	10.000	10.361	103.6
9	LZ89	L7	True	25.000	23.219	92.9
10	LZ90	L8	True	50.000	51.468	102.9

Analyte Name	PFOS_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	498.9 / 98.9	**Result Table**	23-1036
Internal Standard	13C8-PFOS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.15783 x + 0.00281 (r = 0.99825) (weighting: 1 / x) r^2:0.9965

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.141	112.8
4	LZ84	L2	True	0.250	0.217	87.0
5	LZ85	L3	True	0.500	0.391	78.3
6	LZ86	L4	True	1.000	1.207	120.7
7	LZ87	L5	True	2.500	2.718	108.7
8	LZ88	L6	True	10.000	9.584	95.8
9	LZ89	L7	True	25.000	23.259	93.0
10	LZ90	L8	True	50.000	51.858	103.7

Analyte Name	NMeFOSAA_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	570.1 / 419.0	**Result Table**	23-1036
Internal Standard	d3-MeFOSAA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.81432 x + -0.00279 (r = 0.99985) (weighting: 1 / x) r^2:0.9997

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.124	99.4
4	LZ84	L2	True	0.250	0.254	101.7
5	LZ85	L3	True	0.500	0.501	100.1
6	LZ86	L4	True	1.000	0.954	95.4
7	LZ87	L5	True	2.500	2.495	99.8
8	LZ88	L6	True	10.000	10.467	104.7
9	LZ89	L7	True	25.000	24.861	99.4
10	LZ90	L8	True	50.000	49.719	99.4

Analyte Name	NMeFOSAA_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	570.1 / 483.0	**Result Table**	23-1036
Internal Standard	d3-MeFOSAA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.04537 x + -3.46146e-4 (r = 0.99582) (weighting: 1 / x) r^2:0.9917

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.173	138.7
4	LZ84	L2	True	0.250	0.111	44.6
5	LZ85	L3	True	0.500	0.861	172.2
6	LZ86	L4	True	1.000	0.779	77.9
7	LZ87	L5	True	2.500	1.756	70.3
8	LZ88	L6	True	10.000	9.483	94.8
9	LZ89	L7	True	25.000	24.533	98.1
10	LZ90	L8	True	50.000	51.677	103.4

Analyte Name	NEtFOSAA_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	584.2 / 419.1	**Result Table**	23-1036
Internal Standard	d5-EtFOSAA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.86742 x + -0.00484 (r = 0.99959) (weighting: 1 / x) r^2:0.9992

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.126	101.2
4	LZ84	L2	True	0.250	0.277	110.7
5	LZ85	L3	True	0.500	0.495	99.0
6	LZ86	L4	True	1.000	1.011	101.1
7	LZ87	L5	True	2.500	2.321	92.8
8	LZ88	L6	True	10.000	9.339	93.4
9	LZ89	L7	True	25.000	25.092	100.4
10	LZ90	L8	True	50.000	50.714	101.4

Analyte Name	NEtFOSAA_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	584.2 / 526.0	**Result Table**	23-1036
Internal Standard	d5-EtFOSAA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.98512 x + -0.00729 (r = 0.99861) (weighting: 1 / x) r^2:0.9972

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.143	114.6
4	LZ84	L2	True	0.250	0.267	106.7
5	LZ85	L3	True	0.500	0.520	104.0
6	LZ86	L4	True	1.000	0.964	96.4
7	LZ87	L5	True	2.500	2.188	87.5
8	LZ88	L6	True	10.000	8.774	87.7
9	LZ89	L7	True	25.000	25.048	100.2
10	LZ90	L8	True	50.000	51.471	102.9

Analyte Name	HFPO-DA_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	284.9 / 168.9	**Result Table**	23-1036
Internal Standard	13C3-HFPO-DA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.17381 x + -0.00328 (r = 0.99888) (weighting: 1 / x) r^2:0.9978

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.156	124.9
4	LZ84	L2	True	0.250	0.231	92.4
5	LZ85	L3	True	0.500	0.503	100.6
6	LZ86	L4	True	1.000	0.977	97.7
7	LZ87	L5	True	2.500	2.320	92.8
8	LZ88	L6	True	10.000	9.066	90.7
9	LZ89	L7	True	25.000	24.341	97.4
10	LZ90	L8	True	50.000	51.781	103.6

Analyte Name	HFPO-DA_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	284.9 / 184.9	**Result Table**	23-1036
Internal Standard	13C3-HFPO-DA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.17154 x + 4.41809e-4 (r = 0.99977) (weighting: 1 / x) r^2:0.9995

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.138	110.4
4	LZ84	L2	True	0.250	0.228	91.3
5	LZ85	L3	True	0.500	0.514	102.7
6	LZ86	L4	True	1.000	1.057	105.7
7	LZ87	L5	True	2.500	2.312	92.5
8	LZ88	L6	True	10.000	9.663	96.6
9	LZ89	L7	True	25.000	24.927	99.7
10	LZ90	L8	True	50.000	50.537	101.1

Analyte Name	ADONA_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	376.9 / 250.9	**Result Table**	23-1036
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.96228 x + -0.01116 (r = 0.99933) (weighting: 1 / x) r^2:0.9987

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.132	105.3
4	LZ84	L2	True	0.250	0.263	105.3
5	LZ85	L3	True	0.500	0.483	96.7
6	LZ86	L4	True	1.000	0.966	96.6
7	LZ87	L5	True	2.500	2.214	88.6
8	LZ88	L6	True	10.000	10.829	108.3
9	LZ89	L7	True	25.000	25.172	100.7
10	LZ90	L8	True	50.000	49.316	98.6

Analyte Name	ADONA_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	376.9 / 84.8	**Result Table**	23-1036
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.00482 x + -4.75983e-5 (r = 0.99570) (weighting: 1 / x) r^2:0.9914

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.155	124.1
4	LZ84	L2	True	0.250	0.245	98.2
5	LZ85	L3	True	0.500	0.467	93.4
6	LZ86	L4	True	1.000	0.949	94.9
7	LZ87	L5	True	2.500	2.041	81.7
8	LZ88	L6	True	10.000	11.564	115.6
9	LZ89	L7	True	25.000	22.128	88.5
10	LZ90	L8	True	50.000	51.825	103.7

Analyte Name	9Cl-PF3ONS_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	530.8 / 351.0	**Result Table**	23-1036
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.64064 x + -5.41929e-5 (r = 0.99909) (weighting: 1 / x) r^2:0.9982

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.109	87.6
4	LZ84	L2	True	0.250	0.241	96.6
5	LZ85	L3	True	0.500	0.511	102.1
6	LZ86	L4	True	1.000	1.021	102.1
7	LZ87	L5	True	2.500	2.573	102.9
8	LZ88	L6	True	10.000	11.095	111.0
9	LZ89	L7	True	25.000	25.061	100.2
10	LZ90	L8	True	50.000	48.764	97.5

Analyte Name	9Cl-PF3ONS_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	532.8 / 353.0	**Result Table**	23-1036
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.20484 x + 0.00103 (r = 0.99962) (weighting: 1 / x) r^2:0.9992

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	0.125	0.108	86.8
4	LZ84	L2	True	0.250	0.257	102.8
5	LZ85	L3	True	0.500	0.525	105.0
6	LZ86	L4	True	1.000	1.038	103.8
7	LZ87	L5	True	2.500	2.510	100.4
8	LZ88	L6	True	10.000	10.411	104.1
9	LZ89	L7	True	25.000	24.033	96.1
10	LZ90	L8	True	50.000	50.492	101.0

Analyte Name	11Cl-PF3OUdS_1	**Data File**	AD_08222023_5-369.wiff
MRM Transition	630.9 / 450.9	**Result Table**	23-1036
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.59693 x + -0.03579 (r = 0.99910) (weighting: 1 / x) r^2:0.9982

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	False	0.125	0.214	170.9
4	LZ84	L2	True	0.250	0.298	119.3
5	LZ85	L3	True	0.500	0.502	100.4
6	LZ86	L4	True	1.000	0.984	98.4
7	LZ87	L5	True	2.500	2.136	85.4
8	LZ88	L6	True	10.000	9.703	97.0
9	LZ89	L7	True	25.000	24.104	96.4
10	LZ90	L8	True	50.000	51.523	103.1

Analyte Name	11Cl-PF3OUdS_2	**Data File**	AD_08222023_5-369.wiff
MRM Transition	632.9 / 452.9	**Result Table**	23-1036
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.48711 x + -0.00697 (r = 0.99459) (weighting: 1 / x) r^2:0.9892

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	False	0.125	0.180	144.1
4	LZ84	L2	True	0.250	0.301	120.2
5	LZ85	L3	True	0.500	0.487	97.4
6	LZ86	L4	True	1.000	1.006	100.6
7	LZ87	L5	True	2.500	2.372	94.9
8	LZ88	L6	True	10.000	9.183	91.8
9	LZ89	L7	True	25.000	21.630	86.5
10	LZ90	L8	True	50.000	54.272	108.5

Analyte Name	13C5-PFHxA	**Data File**	AD_08222023_5-369.wiff
MRM Transition	318.0 / 273.0	**Result Table**	23-1036_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.03194 x (std. dev. = 0.03968) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	4.917	98.3
4	LZ84	L2	True	5.000	5.096	101.9
5	LZ85	L3	True	5.000	5.258	105.2
6	LZ86	L4	True	5.000	4.870	97.4
7	LZ87	L5	True	5.000	5.169	103.4
8	LZ88	L6	True	5.000	5.153	103.1
9	LZ89	L7	True	5.000	4.754	95.1
10	LZ90	L8	True	5.000	4.784	95.7

Analyte Name	13C4-PFHpA	**Data File**	AD_08222023_5-369.wiff
MRM Transition	367.1 / 322.0	**Result Table**	23-1036_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.68952 x (std. dev. = 0.06566) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	4.926	98.5
4	LZ84	L2	True	5.000	5.189	103.8
5	LZ85	L3	True	5.000	5.192	103.8
6	LZ86	L4	True	5.000	4.644	92.9
7	LZ87	L5	True	5.000	4.864	97.3
8	LZ88	L6	True	5.000	5.159	103.2
9	LZ89	L7	True	5.000	5.100	102.0
10	LZ90	L8	True	5.000	4.925	98.5

Analyte Name	13C8-PFOA	**Data File**	AD_08222023_5-369.wiff
MRM Transition	421.1 / 376.0	**Result Table**	23-1036_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.32619 x (std. dev. = 0.04458) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	5.137	102.7
4	LZ84	L2	True	5.000	5.148	103.0
5	LZ85	L3	True	5.000	4.973	99.5
6	LZ86	L4	True	5.000	4.819	96.4
7	LZ87	L5	True	5.000	4.935	98.7
8	LZ88	L6	True	5.000	4.724	94.5
9	LZ89	L7	True	5.000	5.197	103.9
10	LZ90	L8	True	5.000	5.067	101.3

Analyte Name	13C9-PFNA	**Data File**	AD_08222023_5-369.wiff
MRM Transition	472.1 / 427.0	**Result Table**	23-1036_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.62461 x (std. dev. = 0.03646) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	4.678	93.6
4	LZ84	L2	True	5.000	4.667	93.4
5	LZ85	L3	True	5.000	4.998	100.0
6	LZ86	L4	True	5.000	4.813	96.3
7	LZ87	L5	True	5.000	4.928	98.6
8	LZ88	L6	True	5.000	5.293	105.9
9	LZ89	L7	True	5.000	5.135	102.7
10	LZ90	L8	True	5.000	5.488	109.8

Analyte Name	13C6-PFDA	**Data File**	AD_08222023_5-369.wiff
MRM Transition	519.1 / 474.1	**Result Table**	23-1036_SIS
Internal Standard	13C2-PFDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.32380 x (std. dev. = 0.08818) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	5.161	103.2
4	LZ84	L2	True	5.000	5.130	102.6
5	LZ85	L3	True	5.000	5.125	102.5
6	LZ86	L4	True	5.000	5.321	106.4
7	LZ87	L5	True	5.000	5.035	100.7
8	LZ88	L6	True	5.000	4.273	85.5
9	LZ89	L7	True	5.000	5.182	103.7
10	LZ90	L8	True	5.000	4.772	95.5

Analyte Name	13C7-PFUnA	**Data File**	AD_08222023_5-369.wiff
MRM Transition	570.0 / 525.1	**Result Table**	23-1036_SIS
Internal Standard	13C2-PFDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 2.05733 x (std. dev. = 0.10547) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	4.853	97.1
4	LZ84	L2	True	5.000	5.351	107.0
5	LZ85	L3	True	5.000	5.064	101.3
6	LZ86	L4	True	5.000	5.140	102.8
7	LZ87	L5	True	5.000	5.054	101.1
8	LZ88	L6	True	5.000	4.503	90.1
9	LZ89	L7	True	5.000	5.161	103.2
10	LZ90	L8	True	5.000	4.875	97.5

Analyte Name	13C2-PFDoA	**Data File**	AD_08222023_5-369.wiff
MRM Transition	615.1 / 570.0	**Result Table**	23-1036_SIS
Internal Standard	13C2-PFDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 2.41882 x (std. dev. = 0.19062) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	5.028	100.6
4	LZ84	L2	True	5.000	4.969	99.4
5	LZ85	L3	True	5.000	5.164	103.3
6	LZ86	L4	True	5.000	5.532	110.6
7	LZ87	L5	True	5.000	5.209	104.2
8	LZ88	L6	True	5.000	4.267	85.4
9	LZ89	L7	True	5.000	5.216	104.3
10	LZ90	L8	True	5.000	4.615	92.3

Analyte Name	13C2-PFTeDA	**Data File**	AD_08222023_5-369.wiff
MRM Transition	715.2 / 670.0	**Result Table**	23-1036_SIS
Internal Standard	13C2-PFDA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 1.43600 x (std. dev. = 0.06279) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	4.786	95.7
4	LZ84	L2	True	5.000	4.868	97.4
5	LZ85	L3	True	5.000	5.122	102.4
6	LZ86	L4	True	5.000	5.157	103.1
7	LZ87	L5	True	5.000	5.109	102.2
8	LZ88	L6	True	5.000	4.605	92.1
9	LZ89	L7	True	5.000	5.202	104.0
10	LZ90	L8	True	5.000	5.151	103.0

Analyte Name	13C3-PFBS	**Data File**	AD_08222023_5-369.wiff
MRM Transition	302.1 / 79.9	**Result Table**	23-1036_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 5.83730 x (std. dev. = 0.38120) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	4.660	4.863	104.4
4	LZ84	L2	True	4.660	4.727	101.4
5	LZ85	L3	True	4.660	5.020	107.7
6	LZ86	L4	True	4.660	4.769	102.3
7	LZ87	L5	True	4.660	4.919	105.6
8	LZ88	L6	True	4.660	4.484	96.2
9	LZ89	L7	True	4.660	4.361	93.6
10	LZ90	L8	True	4.660	4.137	88.8

Analyte Name	13C3-PFHxS	**Data File**	AD_08222023_5-369.wiff
MRM Transition	402.1 / 79.9	**Result Table**	23-1036_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 4.23115 x (std. dev. = 0.19014) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	4.740	4.898	103.3
4	LZ84	L2	True	4.740	5.038	106.3
5	LZ85	L3	True	4.740	4.297	90.7
6	LZ86	L4	True	4.740	4.696	99.1
7	LZ87	L5	True	4.740	4.684	98.8
8	LZ88	L6	True	4.740	4.785	101.0
9	LZ89	L7	True	4.740	4.762	100.5
10	LZ90	L8	True	4.740	4.760	100.4

Analyte Name	13C8-PFOS	**Data File**	AD_08222023_5-369.wiff
MRM Transition	507.1 / 79.9	**Result Table**	23-1036_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 2.30405 x (std. dev. = 0.08996) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	4.790	4.941	103.2
4	LZ84	L2	True	4.790	4.508	94.1
5	LZ85	L3	True	4.790	4.889	102.1
6	LZ86	L4	True	4.790	4.501	94.0
7	LZ87	L5	True	4.790	4.777	99.7
8	LZ88	L6	True	4.790	4.817	100.6
9	LZ89	L7	True	4.790	4.971	103.8
10	LZ90	L8	True	4.790	4.916	102.6

Analyte Name	d3-MeFOSAA	**Data File**	AD_08222023_5-369.wiff
MRM Transition	573.2 / 419.0	**Result Table**	23-1036_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 3.74373 x (std. dev. = 0.24167) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	5.393	107.9
4	LZ84	L2	True	5.000	4.478	89.6
5	LZ85	L3	True	5.000	4.818	96.4
6	LZ86	L4	True	5.000	4.943	98.9
7	LZ87	L5	True	5.000	5.036	100.7
8	LZ88	L6	True	5.000	4.770	95.4
9	LZ89	L7	True	5.000	5.118	102.4
10	LZ90	L8	True	5.000	5.444	108.9

Analyte Name	d5-EtFOSAA	**Data File**	AD_08222023_5-369.wiff
MRM Transition	589.2 / 419.0	**Result Table**	23-1036_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 3.75359 x (std. dev. = 0.14875) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	5.225	104.5
4	LZ84	L2	True	5.000	5.115	102.3
5	LZ85	L3	True	5.000	4.752	95.1
6	LZ86	L4	True	5.000	4.686	93.7
7	LZ87	L5	True	5.000	4.944	98.9
8	LZ88	L6	True	5.000	5.100	102.0
9	LZ89	L7	True	5.000	4.982	99.6
10	LZ90	L8	True	5.000	5.194	103.9

Analyte Name	13C3-HFPO-DA	**Data File**	AD_08222023_5-369.wiff
MRM Transition	286.9 / 168.9	**Result Table**	23-1036_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Acquisition Method**	5-369_ACN.dam

Regression Equation: y = 0.22160 x (std. dev. = 0.01311) (weighting: None) r^2:N/A

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/mL)	Calculated Conc. (ng/mL)	Recovery (%)
3	LZ83	L1	True	5.000	4.526	90.5
4	LZ84	L2	True	5.000	4.849	97.0
5	LZ85	L3	True	5.000	5.042	100.8
6	LZ86	L4	True	5.000	4.732	94.6
7	LZ87	L5	True	5.000	4.938	98.8
8	LZ88	L6	True	5.000	5.234	104.7
9	LZ89	L7	True	5.000	5.300	106.0
10	LZ90	L8	True	5.000	5.379	107.6

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	Isotope Dilution Calibration Curve Concentrations (ng/mL)									IB (ng/mL)	ICC (ng/mL)
	LZ82	LZ83	LZ84	LZ85	LZ86	LZ87	LZ88	LZ89	LZ90	LZ91	LZ92
PFMPA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFEESA	0.045	0.112	0.223	0.446	0.892	2.230	8.920	22.300	44.600	-	2.230
NFDHA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFMBA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFBA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFPeA	0.051	0.126	0.253	0.505	1.010	2.525	10.100	25.250	50.500	-	2.525
PFHxA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFHpA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFOA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFNA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFDA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFUnA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFDoA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFTrDA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFTeDA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFHxDA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFODA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
NMeFOSAA (Branched)	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
NEtFOSAA (Branched)	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
NMeFOSA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
NEtFOSA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
NMeFOSE	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
NEtFOSE	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFOSA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFBS	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFPeS	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFHxS (Branched)	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFHpS	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFOS (Branched)	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
PFNS	0.051	0.126	0.253	0.505	1.010	2.525	10.100	25.250	50.500	-	2.525
PFDS	0.051	0.126	0.253	0.505	1.010	2.525	10.100	25.250	50.500	-	2.525
PFDoS	0.049	0.121	0.243	0.485	0.970	2.425	9.700	24.250	48.500	-	2.425
4:2FTS	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
6:2FTS	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
8:2FTS	0.051	0.126	0.253	0.505	1.010	2.525	10.100	25.250	50.500	-	2.525
10:2FTS	0.048	0.121	0.242	0.483	0.966	2.415	9.660	24.150	48.300	-	2.415
3:3 FTCA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
5:3 FTCA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
7:3 FTCA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
HFPO-DA	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
Adona	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
9Cl-PF3ONS	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
11Cl-PF3OUdS	0.050	0.125	0.250	0.500	1.000	2.500	10.000	25.000	50.000	-	2.500
	Surrogates / Extracted Internal Standards										
13C4-PFBA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C5-PFPeA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C5-PFHxA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C4-PFHpA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C8-PFOA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C9-PFNA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C6-PFDA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C7-PFUnA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C2-PFDoA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C2-PFTeDA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C2-PFHxDA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
d3-MeFOSAA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
d5-EtFOSAA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
D3-MeFOSA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
D5-EtFOSA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
D7-MeFOSE	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
D9-EtFOSE	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C8-FOSA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C3-PFBS	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.660	4.660
13C3-PFHxS	4.740	4.740	4.740	4.740	4.740	4.740	4.740	4.740	4.740	4.740	4.740
13C8-PFOS	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790
13C2-4:2FTS	4.690	4.690	4.690	4.690	4.690	4.690	4.690	4.690	4.690	4.690	4.690
13C2-6:2FTS	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.760	4.760
13C2-8:2FTS	4.800	4.800	4.800	4.800	4.800	4.800	4.800	4.800	4.800	4.800	4.800
13C3-HFPO-DA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
	Internal Standards										
13C3-PFBA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C2-PFOA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C2-PFDA	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
13C4-PFOS	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790	4.790

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PFAS Calibration Quant Report

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Printed: 24/08/2023 8:43:50 AM

Sample Name	LZ83	**Injection Vial**	3
Sample ID	L1	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.52	50499.39	0.150	396.3	6.51	13C5-PFHxA	1841052.38	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.52	772.84	0.085	37.4	6.51	13C5-PFHxA	1841052.38	5.000	PFHxA	0.015	0.024	✓
PFHpA_1	363.1 / 319.0	7.24	86672.75	0.148	246.5	7.22	13C4-PFHpA	3019826.31	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	7.25	997.26	0.128	493.2	7.22	13C4-PFHpA	3019826.31	5.000	PFHpA	0.012	0.013	✓
PFOA_1	413.0 / 369.0	7.81	60675.70	0.137	246.4	7.79	13C8-PFOA	2471888.54	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.81	2485.77	0.125	131.4	7.79	13C8-PFOA	2471888.54	5.000	PFOA	0.041	0.038	✓
PFNA_1	463.0 / 419.0	8.31	30616.67	0.153	163.7	8.29	13C9-PFNA	1060293.99	5.000	PFNA			
PFNA_2	463.0 / 219.0	8.30	2441.48	0.095	294.4	8.29	13C9-PFNA	1060293.99	5.000	PFNA	0.080	0.147	✓
PFDA_1	512.9 / 469.0	8.78	13132.25	0.137	133.6	8.76	13C6-PFDA	1188542.50	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.79	581.90	0.200	2075.6	8.76	13C6-PFDA	1188542.50	5.000	PFDA	0.044	0.027	
PFUnA_1	563.1 / 519.0	9.24	43101.79	0.160	248.0	9.22	13C7-PFUnA	1737033.81	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	9.24	1143.90	0.117	1984.7	9.22	13C7-PFUnA	1737033.81	5.000	PFUnA	0.027	0.044	✓
PFDoA_1	613.1 / 569.0	9.70	27643.45	0.129	220.4	9.68	13C2-PFDoA	2115890.92	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.70	5475.39	0.132	988.5	9.68	13C2-PFDoA	2115890.92	5.000	PFDoA	0.198	0.180	✓
PFTrDA_1	663.0 / 619.0	10.13	32439.64	0.125	214.5	10.52	13C2-PFTeDA	1195781.08	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	10.15	730.99	0.128	5363.9	10.52	13C2-PFTeDA	1195781.08	5.000	PFTrDA	0.023	0.025	✓
PFTeDA_1	713.0 / 669.0	10.54	27227.13	0.129	291.9	10.52	13C2-PFTeDA	1195781.08	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	10.53	470.32	0.070	102996.9	10.52	13C2-PFTeDA	1195781.08	5.000	PFTeDA	0.017	0.022	✓
PFBS_1	298.7 / 79.9	6.47	2904.61	0.135	792.2	6.46	13C3-PFBS	426433.91	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.48	2714.46	0.124	172.9	6.46	13C3-PFBS	426433.91	4.660	PFBS	0.935	1.063	✓
PFHxS_1	399.0 / 80.0	7.94	7857.48	0.115	4749.8	7.92	13C3-PFHxS	311338.52	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.93	2785.85	0.111	137.2	7.92	13C3-PFHxS	311338.52	4.740	PFHxS	0.355	0.368	✓
PFOS_1	498.9 / 79.9	8.96	3790.80	0.125	284738.1	8.94	13C8-PFOS	171022.62	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.96	1275.45	0.141	190840.4	8.94	13C8-PFOS	171022.62	4.790	PFOS	0.337	0.268	✓
NMeFOSAA_1	570.1 / 419.0	8.78	5290.84	0.124	136.7	8.77	d3-MeFOSAA	303303.40	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.66	372.31	0.173	3545.6	8.77	d3-MeFOSAA	303303.40	5.000	NMeFOSAA	0.070	0.054	✓
NEtFOSAA_1	584.2 / 419.1	8.97	5037.46	0.126	1142.6	8.95	d5-EtFOSAA	294639.95	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.97	6165.05	0.143	2577.9	8.95	d5-EtFOSAA	294639.95	5.000	NEtFOSAA	1.224	1.117	✓
HFPO-DA_1	284.9 / 168.9	6.79	12148.37	0.156	2362.2	6.77	13C3-HFPO-DA	363955.50	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.79	1883.94	0.138	27.9	6.77	13C3-HFPO-DA	363955.50	5.000	HFPO-DA	0.155	0.154	✓
ADONA_1	376.9 / 250.9	7.45	100086.57	0.132	5921.6	7.79	13C8-PFOA	2471888.54	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.46	251.81	0.155	61.6	7.79	13C8-PFOA	2471888.54	5.000	ADONA	0.003	0.002	✓
9Cl-PF3ONS_1	530.8 / 351.0	9.28	34543.02	0.109	13763.8	7.79	13C8-PFOA	2471888.54	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	9.29	13540.82	0.108	968.5	7.79	13C8-PFOA	2471888.54	5.000	9Cl-PF3ONS	0.392	0.337	✓
11Cl-PF3OUdS_1	630.9 / 450.9	10.18	80181.04	0.214	1789.0	7.79	13C8-PFOA	2471888.54	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	10.18	26161.26	0.180	773.2	7.79	13C8-PFOA	2471888.54	5.000	11Cl-PF3OUdS	0.326	0.323	✓

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PFAS Calibration Quant Report

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Sample Name	LZ84	**Injection Vial**	4
Sample ID	L2	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:57:41 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.53	116478.83	0.269	522.0	6.51	13C5-PFHxA	2034195.53	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.53	3618.45	0.321	208.3	6.51	13C5-PFHxA	2034195.53	5.000	PFHxA	0.031	0.024	✓
PFHpA_1	363.1 / 319.0	7.25	183452.21	0.256	357.1	7.23	13C4-PFHpA	3391707.39	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	7.25	2834.72	0.291	17777.5	7.23	13C4-PFHpA	3391707.39	5.000	PFHpA	0.016	0.013	✓
PFOA_1	413.0 / 369.0	7.81	127280.09	0.252	412.2	7.79	13C8-PFOA	2640979.61	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.81	4880.18	0.242	827.0	7.79	13C8-PFOA	2640979.61	5.000	PFOA	0.038	0.038	✓
PFNA_1	463.0 / 419.0	8.31	62202.23	0.272	291.2	8.29	13C9-PFNA	1127781.51	5.000	PFNA			
PFNA_2	463.0 / 219.0	8.31	10907.07	0.322	1967.9	8.29	13C9-PFNA	1127781.51	5.000	PFNA	0.175	0.147	✓
PFDA_1	512.9 / 469.0	8.77	26256.61	0.232	245.2	8.76	13C6-PFDA	1223969.81	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.76	482.52	0.168	2075.6	8.76	13C6-PFDA	1223969.81	5.000	PFDA	0.018	0.027	✓
PFUnA_1	563.1 / 519.0	9.24	78441.48	0.239	369.0	9.22	13C7-PFUnA	1983876.07	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	9.24	3631.13	0.257	189.6	9.22	13C7-PFUnA	1983876.07	5.000	PFUnA	0.046	0.044	✓
PFDoA_1	613.1 / 569.0	9.70	51562.01	0.242	332.5	9.68	13C2-PFDoA	2165943.06	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.70	10067.25	0.256	15065.6	9.68	13C2-PFDoA	2165943.06	5.000	PFDoA	0.195	0.180	✓
PFTrDA_1	663.0 / 619.0	10.13	69479.58	0.256	422.2	10.51	13C2-PFTeDA	1259706.79	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	10.12	1892.32	0.284	9533.2	10.51	13C2-PFTeDA	1259706.79	5.000	PFTrDA	0.027	0.025	✓
PFTeDA_1	713.0 / 669.0	10.53	56956.08	0.266	577.4	10.51	13C2-PFTeDA	1259706.79	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	10.53	1762.99	0.375	12247.4	10.51	13C2-PFTeDA	1259706.79	5.000	PFTeDA	0.031	0.022	✓
PFBS_1	298.7 / 79.9	6.48	4856.12	0.215	31350.2	6.47	13C3-PFBS	481031.41	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.48	6109.47	0.267	258.5	6.47	13C3-PFBS	481031.41	4.660	PFBS	1.258	1.063	✓
PFHxS_1	399.0 / 80.0	7.94	20738.39	0.258	2205.6	7.92	13C3-PFHxS	371611.06	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.93	6760.40	0.229	137.5	7.92	13C3-PFHxS	371611.06	4.740	PFHxS	0.326	0.368	✓
PFOS_1	498.9 / 79.9	8.95	6133.89	0.214	153.4	8.94	13C8-PFOS	181095.64	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.95	1807.16	0.217	20043.0	8.94	13C8-PFOS	181095.64	4.790	PFOS	0.295	0.268	✓
NMeFOSAA_1	570.1 / 419.0	8.78	11292.06	0.254	3853.9	8.77	d3-MeFOSAA	292258.71	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.79	194.34	0.111	3545.6	8.77	d3-MeFOSAA	292258.71	5.000	NMeFOSAA	0.017	0.054	
NEtFOSAA_1	584.2 / 419.1	8.96	14455.41	0.277	1020.3	8.95	d5-EtFOSAA	334757.63	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.96	15144.78	0.267	1182.4	8.95	d5-EtFOSAA	334757.63	5.000	NEtFOSAA	1.048	1.117	✓
HFPO-DA_1	284.9 / 168.9	6.79	21179.43	0.231	119840.3	6.78	13C3-HFPO-DA	415716.55	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.79	3440.68	0.228	86.7	6.78	13C3-HFPO-DA	415716.55	5.000	HFPO-DA	0.163	0.154	✓
ADONA_1	376.9 / 250.9	7.45	243464.07	0.263	1102.6	7.79	13C8-PFOA	2640979.61	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.44	499.04	0.245	15233.5	7.79	13C8-PFOA	2640979.61	5.000	ADONA	0.002	0.002	✓
9Cl-PF3ONS_1	530.8 / 351.0	9.28	81558.33	0.241	3732.0	7.79	13C8-PFOA	2640979.61	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	9.28	30538.97	0.257	61000.0	7.79	13C8-PFOA	2640979.61	5.000	9Cl-PF3ONS	0.374	0.337	✓
11Cl-PF3OUdS_1	630.9 / 450.9	10.18	157109.12	0.298	2721.1	7.79	13C8-PFOA	2640979.61	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	10.18	58939.57	0.301	878.6	7.79	13C8-PFOA	2640979.61	5.000	11Cl-PF3OUdS	0.375	0.323	✓

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PFAS Calibration Quant Report

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Sample Name	LZ85	**Injection Vial**	5
Sample ID	L3	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 6:13:44 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.53	204017.75	0.474	679.1	6.51	13C5-PFHxA	1873187.43	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.53	5789.15	0.550	255.7	6.51	13C5-PFHxA	1873187.43	5.000	PFHxA	0.028	0.024	✓
PFHpA_1	363.1 / 319.0	7.25	331389.00	0.491	455.9	7.23	13C4-PFHpA	3028282.18	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	7.25	4220.69	0.472	566.8	7.23	13C4-PFHpA	3028282.18	5.000	PFHpA	0.013	0.013	✓
PFOA_1	413.0 / 369.0	7.81	230238.53	0.511	537.6	7.79	13C8-PFOA	2277010.28	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.81	7788.44	0.460	3784.8	7.79	13C8-PFOA	2277010.28	5.000	PFOA	0.034	0.038	✓
PFNA_1	463.0 / 419.0	8.31	106484.18	0.469	428.8	8.29	13C9-PFNA	1077801.74	5.000	PFNA			
PFNA_2	463.0 / 219.0	8.31	17584.48	0.528	18277.7	8.29	13C9-PFNA	1077801.74	5.000	PFNA	0.165	0.147	✓
PFDA_1	512.9 / 469.0	8.77	59075.73	0.516	374.4	8.76	13C6-PFDA	1126719.00	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.77	1258.08	0.411	10071.2	8.76	13C6-PFDA	1126719.00	5.000	PFDA	0.021	0.027	✓
PFUnA_1	563.1 / 519.0	9.24	146317.53	0.481	482.5	9.22	13C7-PFUnA	1730066.48	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	9.23	5530.61	0.420	1940.0	9.22	13C7-PFUnA	1730066.48	5.000	PFUnA	0.038	0.044	✓
PFDoA_1	613.1 / 569.0	9.70	101436.88	0.504	560.4	9.68	13C2-PFDoA	2074480.67	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.70	18129.86	0.500	810.6	9.68	13C2-PFDoA	2074480.67	5.000	PFDoA	0.179	0.180	✓
PFTrDA_1	663.0 / 619.0	10.13	130058.28	0.495	470.9	10.52	13C2-PFTeDA	1221482.21	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	10.14	2673.69	0.405	65135.8	10.52	13C2-PFTeDA	1221482.21	5.000	PFTrDA	0.021	0.025	✓
PFTeDA_1	713.0 / 669.0	10.54	87619.74	0.428	606.7	10.52	13C2-PFTeDA	1221482.21	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	10.54	2170.04	0.489	13412.2	10.52	13C2-PFTeDA	1221482.21	5.000	PFTeDA	0.025	0.022	✓
PFBS_1	298.7 / 79.9	6.48	9060.21	0.465	1238.0	6.47	13C3-PFBS	445317.29	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.48	9725.16	0.473	436.3	6.47	13C3-PFBS	445317.29	4.660	PFBS	1.073	1.063	✓
PFHxS_1	399.0 / 80.0	7.94	31014.34	0.523	9861.6	7.92	13C3-PFHxS	276302.09	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.93	12177.34	0.558	298.0	7.92	13C3-PFHxS	276302.09	4.740	PFHxS	0.393	0.368	✓
PFOS_1	498.9 / 79.9	8.95	13914.36	0.572	82886.9	8.94	13C8-PFOS	171179.31	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.96	2689.84	0.391	2108.2	8.94	13C8-PFOS	171179.31	4.790	PFOS	0.193	0.268	✓
NMeFOSAA_1	570.1 / 419.0	8.78	21584.23	0.501	2159.1	8.77	d3-MeFOSAA	274087.01	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.64	2046.92	0.861	71.5	8.77	d3-MeFOSAA	274087.01	5.000	NMeFOSAA	0.095	0.054	
NEtFOSAA_1	584.2 / 419.1	8.96	21970.37	0.495	639.7	8.95	d5-EtFOSAA	271079.25	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.96	25786.18	0.520	115.9	8.95	d5-EtFOSAA	271079.25	5.000	NEtFOSAA	1.174	1.117	✓
HFPO-DA_1	284.9 / 168.9	6.79	44278.21	0.503	1854.3	6.78	13C3-HFPO-DA	385715.66	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.79	6966.09	0.514	182.6	6.78	13C3-HFPO-DA	385715.66	5.000	HFPO-DA	0.157	0.154	✓
ADONA_1	376.9 / 250.9	7.45	406466.05	0.483	90841797.3	7.79	13C8-PFOA	2277010.28	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.45	916.43	0.467	18499.4	7.79	13C8-PFOA	2277010.28	5.000	ADONA	0.002	0.002	✓
9Cl-PF3ONS_1	530.8 / 351.0	9.28	148822.32	0.511	113048.3	7.79	13C8-PFOA	2277010.28	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	9.28	51323.17	0.525	9208.6	7.79	13C8-PFOA	2277010.28	5.000	9Cl-PF3ONS	0.345	0.337	✓
11Cl-PF3OUdS_1	630.9 / 450.9	10.18	283491.88	0.502	2456.1	7.79	13C8-PFOA	2277010.28	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	10.18	92168.13	0.487	1637.8	7.79	13C8-PFOA	2277010.28	5.000	11Cl-PF3OUdS	0.325	0.323	✓

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PFAS Calibration Quant Report

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Sample Name	LZ86	**Injection Vial**	6
Sample ID	L4	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 6:29:47 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.53	431732.53	0.949	896.9	6.51	13C5-PFHxA	1893303.87	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.52	11194.75	1.041	404.3	6.51	13C5-PFHxA	1893303.87	5.000	PFHxA	0.026	0.024	✓
PFHpA_1	363.1 / 319.0	7.25	642704.94	0.950	728.0	7.23	13C4-PFHpA	2956255.55	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	7.25	9079.86	1.016	33811.3	7.23	13C4-PFHpA	2956255.55	5.000	PFHpA	0.014	0.013	✓
PFOA_1	413.0 / 369.0	7.82	445412.39	0.922	760.7	7.79	13C8-PFOA	2408006.02	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.81	19570.96	1.113	817.0	7.79	13C8-PFOA	2408006.02	5.000	PFOA	0.044	0.038	✓
PFNA_1	463.0 / 419.0	8.31	223909.69	0.917	587.9	8.29	13C9-PFNA	1132637.64	5.000	PFNA			
PFNA_2	463.0 / 219.0	8.31	32570.76	0.912	4222.2	8.29	13C9-PFNA	1132637.64	5.000	PFNA	0.146	0.147	✓
PFDA_1	512.9 / 469.0	8.78	124499.85	1.027	664.0	8.76	13C6-PFDA	1148535.44	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.78	2904.98	0.886	2378.6	8.76	13C6-PFDA	1148535.44	5.000	PFDA	0.023	0.027	✓
PFUnA_1	563.1 / 519.0	9.24	321623.12	1.028	1062.6	9.22	13C7-PFUnA	1724279.87	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	9.24	17254.37	1.232	3127.7	9.22	13C7-PFUnA	1724279.87	5.000	PFUnA	0.054	0.044	✓
PFDoA_1	613.1 / 569.0	9.70	223120.24	1.060	983.6	9.68	13C2-PFDoA	2181781.01	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.70	35218.07	0.940	206628.0	9.68	13C2-PFDoA	2181781.01	5.000	PFDoA	0.158	0.180	✓
PFTrDA_1	663.0 / 619.0	10.14	264436.02	1.019	604.0	10.52	13C2-PFTeDA	1207561.08	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	10.14	6639.58	0.986	542.8	10.52	13C2-PFTeDA	1207561.08	5.000	PFTrDA	0.025	0.025	✓
PFTeDA_1	713.0 / 669.0	10.54	215859.37	1.082	878.8	10.52	13C2-PFTeDA	1207561.08	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	10.54	3770.24	0.896	55583.8	10.52	13C2-PFTeDA	1207561.08	5.000	PFTeDA	0.018	0.022	✓
PFBS_1	298.7 / 79.9	6.48	20351.97	1.072	2316.1	6.46	13C3-PFBS	449207.34	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.48	21854.14	1.078	624.9	6.46	13C3-PFBS	449207.34	4.660	PFBS	1.074	1.063	✓
PFHxS_1	399.0 / 80.0	7.94	71790.98	1.046	37102.8	7.92	13C3-PFHxS	320620.66	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.94	28448.81	1.127	539.9	7.92	13C3-PFHxS	320620.66	4.740	PFHxS	0.396	0.368	✓
PFOS_1	498.9 / 79.9	8.96	24453.43	1.063	2195071.1	8.94	13C8-PFOS	167343.60	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.96	7123.65	1.207	607152.5	8.94	13C8-PFOS	167343.60	4.790	PFOS	0.291	0.268	✓
NMeFOSAA_1	570.1 / 419.0	8.78	45565.14	0.954	902.6	8.77	d3-MeFOSAA	298631.38	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.79	2008.17	0.779	83.4	8.77	d3-MeFOSAA	298631.38	5.000	NMeFOSAA	0.044	0.054	✓
NEtFOSAA_1	584.2 / 419.1	8.96	48399.19	1.011	4130.2	8.95	d5-EtFOSAA	283854.75	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.97	51854.57	0.964	372.5	8.95	d5-EtFOSAA	283854.75	5.000	NEtFOSAA	1.071	1.117	✓
HFPO-DA_1	284.9 / 168.9	6.79	89289.15	0.977	4748.7	6.78	13C3-HFPO-DA	395094.94	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.79	14500.40	1.057	218.2	6.78	13C3-HFPO-DA	395094.94	5.000	HFPO-DA	0.162	0.154	✓
ADONA_1	376.9 / 250.9	7.45	885670.73	0.966	9842.6	7.79	13C8-PFOA	2408006.02	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.45	2086.80	0.949	874.4	7.79	13C8-PFOA	2408006.02	5.000	ADONA	0.002	0.002	✓
9Cl-PF3ONS_1	530.8 / 351.0	9.29	314808.90	1.021	7926.5	7.79	13C8-PFOA	2408006.02	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	9.28	104873.57	1.038	1100134.8	7.79	13C8-PFOA	2408006.02	5.000	9Cl-PF3ONS	0.333	0.337	✓
11Cl-PF3OUdS_1	630.9 / 450.9	10.19	670383.89	0.984	3801.0	7.79	13C8-PFOA	2408006.02	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	10.19	219264.66	1.006	3129.6	7.79	13C8-PFOA	2408006.02	5.000	11Cl-PF3OUdS	0.327	0.323	✓

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PFAS Calibration Quant Report

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Sample Name	LZ87	**Injection Vial**	7
Sample ID	L5	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 6:45:50 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.53	1057123.50	2.156	1501.7	6.51	13C5-PFHxA	1990896.86	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.53	26774.76	2.353	749.8	6.51	13C5-PFHxA	1990896.86	5.000	PFHxA	0.025	0.024	✓
PFHpA_1	363.1 / 319.0	7.25	1589700.93	2.230	1043.7	7.23	13C4-PFHpA	3066787.55	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	7.25	20432.18	2.180	2803.7	7.23	13C4-PFHpA	3066787.55	5.000	PFHpA	0.013	0.013	✓
PFOA_1	413.0 / 369.0	7.82	1170790.06	2.363	1251.1	7.79	13C8-PFOA	2442551.52	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.82	44472.99	2.511	66335.6	7.79	13C8-PFOA	2442551.52	5.000	PFOA	0.038	0.038	✓
PFNA_1	463.0 / 419.0	8.31	531190.76	2.115	906.7	8.29	13C9-PFNA	1148711.97	5.000	PFNA			
PFNA_2	463.0 / 219.0	8.31	93047.85	2.528	2278.4	8.29	13C9-PFNA	1148711.97	5.000	PFNA	0.175	0.147	✓
PFDA_1	512.9 / 469.0	8.78	300813.89	2.375	768.8	8.76	13C6-PFDA	1175751.89	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.78	7948.33	2.311	1772.0	8.76	13C6-PFDA	1175751.89	5.000	PFDA	0.026	0.027	✓
PFUnA_1	563.1 / 519.0	9.24	713033.18	2.114	1288.5	9.23	13C7-PFUnA	1834122.68	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	9.24	37515.00	2.477	74778.3	9.23	13C7-PFUnA	1834122.68	5.000	PFUnA	0.053	0.044	✓
PFDoA_1	613.1 / 569.0	9.70	481257.21	2.240	1084.6	9.68	13C2-PFDoA	2222384.02	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.70	90268.37	2.384	2414.7	9.68	13C2-PFDoA	2222384.02	5.000	PFDoA	0.188	0.180	✓
PFTrDA_1	663.0 / 619.0	10.13	635813.91	2.289	1001.9	10.52	13C2-PFTeDA	1294125.20	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	10.13	17871.80	2.447	2877243.2	10.52	13C2-PFTeDA	1294125.20	5.000	PFTrDA	0.028	0.025	✓
PFTeDA_1	713.0 / 669.0	10.54	501126.13	2.355	1656.3	10.52	13C2-PFTeDA	1294125.20	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	10.53	11348.51	2.604	53863.5	10.52	13C2-PFTeDA	1294125.20	5.000	PFTeDA	0.023	0.022	✓
PFBS_1	298.7 / 79.9	6.48	48657.94	2.513	2666.0	6.47	13C3-PFBS	465767.42	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.48	47988.23	2.304	918.6	6.47	13C3-PFBS	465767.42	4.660	PFBS	0.986	1.063	✓
PFHxS_1	399.0 / 80.0	7.94	174484.46	2.541	6102.2	7.92	13C3-PFHxS	321470.46	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.94	58646.01	2.320	890.0	7.92	13C3-PFHxS	321470.46	4.740	PFHxS	0.336	0.368	✓
PFOS_1	498.9 / 79.9	8.96	56542.99	2.353	169.5	8.95	13C8-PFOS	178536.66	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.96	16491.98	2.718	8097.5	8.95	13C8-PFOS	178536.66	4.790	PFOS	0.292	0.268	✓
NMeFOSAA_1	570.1 / 419.0	8.78	123399.80	2.495	675.0	8.77	d3-MeFOSAA	305819.19	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.78	4768.70	1.756	546.9	8.77	d3-MeFOSAA	305819.19	5.000	NMeFOSAA	0.039	0.054	✓
NEtFOSAA_1	584.2 / 419.1	8.97	119733.38	2.321	498444.5	8.95	d5-EtFOSAA	301036.19	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.97	127597.17	2.188	289552.0	8.95	d5-EtFOSAA	301036.19	5.000	NEtFOSAA	1.066	1.117	✓
HFPO-DA_1	284.9 / 168.9	6.79	221124.95	2.320	4430.8	6.78	13C3-HFPO-DA	408380.87	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.79	32567.21	2.312	517.1	6.78	13C3-HFPO-DA	408380.87	5.000	HFPO-DA	0.147	0.154	✓
ADONA_1	376.9 / 250.9	7.45	2094911.97	2.214	28937.9	7.79	13C8-PFOA	2442551.52	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.46	4689.21	2.041	314.0	7.79	13C8-PFOA	2442551.52	5.000	ADONA	0.002	0.002	✓
9Cl-PF3ONS_1	530.8 / 351.0	9.29	805198.71	2.573	37200.2	7.79	13C8-PFOA	2442551.52	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	9.28	253715.80	2.510	4314.3	7.79	13C8-PFOA	2442551.52	5.000	9Cl-PF3ONS	0.315	0.337	✓
11Cl-PF3OUdS_1	630.9 / 450.9	10.18	1578827.95	2.136	11111.7	7.79	13C8-PFOA	2442551.52	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	10.18	547358.85	2.372	4828.6	7.79	13C8-PFOA	2442551.52	5.000	11Cl-PF3OUdS	0.347	0.323	✓

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PFAS Calibration Quant Report

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Sample Name	LZ88	**Injection Vial**	8
Sample ID	L6	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:01:53 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.53	4035457.72	9.322	2722.9	6.51	13C5-PFHxA	1732686.18	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.52	89912.40	9.046	1675.0	6.51	13C5-PFHxA	1732686.18	5.000	PFHxA	0.022	0.024	✓
PFHpA_1	363.1 / 319.0	7.25	6477077.41	9.721	2460.5	7.23	13C4-PFHpA	2840428.96	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	7.25	88596.71	10.130	7671.5	7.23	13C4-PFHpA	2840428.96	5.000	PFHpA	0.014	0.013	✓
PFOA_1	413.0 / 369.0	7.81	4386609.35	10.536	2913.7	7.79	13C8-PFOA	2041444.79	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.81	156734.85	10.637	40536.3	7.79	13C8-PFOA	2041444.79	5.000	PFOA	0.036	0.038	✓
PFNA_1	463.0 / 419.0	8.30	2268866.00	9.554	2114.1	8.28	13C9-PFNA	1077251.16	5.000	PFNA			
PFNA_2	463.0 / 219.0	8.30	331103.12	9.526	3603704.4	8.28	13C9-PFNA	1077251.16	5.000	PFNA	0.146	0.147	✓
PFDA_1	512.9 / 469.0	8.77	1074824.73	9.555	1513.4	8.75	13C6-PFDA	1031991.22	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.77	34474.62	11.279	211673.2	8.75	13C6-PFDA	1031991.22	5.000	PFDA	0.032	0.027	✓
PFUnA_1	563.1 / 519.0	9.24	2918302.90	9.297	2183.7	9.22	13C7-PFUnA	1690151.52	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	9.24	137827.46	9.759	1616803.3	9.22	13C7-PFUnA	1690151.52	5.000	PFUnA	0.047	0.044	✓
PFDoA_1	613.1 / 569.0	9.70	1984617.21	10.507	2037.4	9.68	13C2-PFDoA	1883253.94	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.70	340618.01	10.326	8782.8	9.68	13C2-PFDoA	1883253.94	5.000	PFDoA	0.172	0.180	✓
PFTrDA_1	663.0 / 619.0	10.13	2719757.28	10.508	2002.6	10.51	13C2-PFTeDA	1206394.91	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	10.13	72057.15	10.515	473361.2	10.51	13C2-PFTeDA	1206394.91	5.000	PFTrDA	0.027	0.025	✓
PFTeDA_1	713.0 / 669.0	10.53	1950174.53	9.863	2926.1	10.51	13C2-PFTeDA	1206394.91	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	10.53	41193.69	10.280	1637010.8	10.51	13C2-PFTeDA	1206394.91	5.000	PFTeDA	0.021	0.022	✓
PFBS_1	298.7 / 79.9	6.48	166901.90	10.589	125253.1	6.46	13C3-PFBS	382640.92	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.48	172297.96	10.137	2062.6	6.46	13C3-PFBS	382640.92	4.660	PFBS	1.032	1.063	✓
PFHxS_1	399.0 / 80.0	7.94	604896.16	9.576	6681.8	7.92	13C3-PFHxS	296007.63	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.93	229390.18	9.862	1813.5	7.92	13C3-PFHxS	296007.63	4.740	PFHxS	0.379	0.368	✓
PFOS_1	498.9 / 79.9	8.95	223224.92	10.361	538.7	8.94	13C8-PFOS	162256.11	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.95	51695.64	9.584	577.3	8.94	13C8-PFOS	162256.11	4.790	PFOS	0.232	0.268	✓
NMeFOSAA_1	570.1 / 419.0	8.78	444311.36	10.467	12218.9	8.76	d3-MeFOSAA	261054.40	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.78	22376.58	9.483	1793.0	8.76	d3-MeFOSAA	261054.40	5.000	NMeFOSAA	0.050	0.054	✓
NEtFOSAA_1	584.2 / 419.1	8.96	452047.30	9.339	1323.9	8.95	d5-EtFOSAA	279859.08	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.96	481756.88	8.774	105198.8	8.95	d5-EtFOSAA	279859.08	5.000	NEtFOSAA	1.066	1.117	✓
HFPO-DA_1	284.9 / 168.9	6.79	803123.20	9.066	1631249.3	6.78	13C3-HFPO-DA	377942.78	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.79	125464.07	9.663	857.3	6.78	13C3-HFPO-DA	377942.78	5.000	HFPO-DA	0.156	0.154	✓
ADONA_1	376.9 / 250.9	7.45	8653336.71	10.829	18722.8	7.79	13C8-PFOA	2041444.79	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.45	22653.93	11.564	243008.7	7.79	13C8-PFOA	2041444.79	5.000	ADONA	0.003	0.002	✓
9Cl-PF3ONS_1	530.8 / 351.0	9.28	2901874.78	11.095	33195.3	7.79	13C8-PFOA	2041444.79	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	9.28	872828.50	10.411	6917.2	7.79	13C8-PFOA	2041444.79	5.000	9Cl-PF3ONS	0.301	0.337	✓
11Cl-PF3OUdS_1	630.9 / 450.9	10.18	6253249.44	9.703	9643.9	7.79	13C8-PFOA	2041444.79	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	10.18	1812120.80	9.183	8126.1	7.79	13C8-PFOA	2041444.79	5.000	11Cl-PF3OUdS	0.290	0.323	✓

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PFAS Calibration Quant Report

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Sample Name	LZ89	**Injection Vial**	9
Sample ID	L7	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:17:57 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.53	9334411.51	25.742	3610.2	6.51	13C5-PFHxA	1447378.66	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.53	220298.55	26.511	2733.6	6.51	13C5-PFHxA	1447378.66	5.000	PFHxA	0.024	0.024	✓
PFHpA_1	363.1 / 319.0	7.25	14512530.23	24.296	3143.0	7.23	13C4-PFHpA	2542327.75	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	7.25	181843.64	23.204	2475.9	7.23	13C4-PFHpA	2542327.75	5.000	PFHpA	0.013	0.013	✓
PFOA_1	413.0 / 369.0	7.81	9587724.62	23.099	3010.7	7.79	13C8-PFOA	2033520.10	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.81	326549.73	22.263	2559.2	7.79	13C8-PFOA	2033520.10	5.000	PFOA	0.034	0.038	✓
PFNA_1	463.0 / 419.0	8.31	5366309.88	25.688	2778.8	8.29	13C9-PFNA	946220.01	5.000	PFNA			
PFNA_2	463.0 / 219.0	8.31	783484.14	25.624	34009.0	8.29	13C9-PFNA	946220.01	5.000	PFNA	0.146	0.147	✓
PFDA_1	512.9 / 469.0	8.77	2670475.83	24.880	2169.0	8.75	13C6-PFDA	982341.84	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.77	70847.07	24.310	7230.4	8.75	13C6-PFDA	982341.84	5.000	PFDA	0.027	0.027	✓
PFUnA_1	563.1 / 519.0	9.23	6733760.22	23.808	2702.8	9.22	13C7-PFUnA	1520246.79	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	9.23	314749.97	24.717	9945.3	9.22	13C7-PFUnA	1520246.79	5.000	PFUnA	0.047	0.044	✓
PFDoA_1	613.1 / 569.0	9.69	4746215.23	24.594	3071.0	9.68	13C2-PFDoA	1806461.21	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.69	832559.09	24.795	8794.1	9.68	13C2-PFDoA	1806461.21	5.000	PFDoA	0.175	0.180	✓
PFTrDA_1	663.0 / 619.0	10.12	5845935.78	25.476	3207.5	10.51	13C2-PFTeDA	1069643.05	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	10.12	159887.53	26.285	119350.3	10.51	13C2-PFTeDA	1069643.05	5.000	PFTrDA	0.027	0.025	✓
PFTeDA_1	713.0 / 669.0	10.53	4634738.82	26.453	4293.3	10.51	13C2-PFTeDA	1069643.05	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	10.52	89416.71	25.237	4327.5	10.51	13C2-PFTeDA	1069643.05	5.000	PFTeDA	0.019	0.022	✓
PFBS_1	298.7 / 79.9	6.48	350675.48	25.351	9760.8	6.47	13C3-PFBS	336365.08	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.48	360519.43	24.155	2774.1	6.47	13C3-PFBS	336365.08	4.660	PFBS	1.028	1.063	✓
PFHxS_1	399.0 / 80.0	7.94	1360437.59	23.951	1484244.4	7.92	13C3-PFHxS	266217.94	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.94	557693.56	26.665	2201.9	7.92	13C3-PFHxS	266217.94	4.740	PFHxS	0.410	0.368	✓
PFOS_1	498.9 / 79.9	8.95	465503.81	23.219	498.1	8.94	13C8-PFOS	151323.07	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.95	116398.33	23.259	674.0	8.94	13C8-PFOS	151323.07	4.790	PFOS	0.250	0.268	✓
NMeFOSAA_1	570.1 / 419.0	8.78	1024314.67	24.861	1058851.3	8.77	d3-MeFOSAA	253158.07	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.78	56275.28	24.533	1554366.6	8.77	d3-MeFOSAA	253158.07	5.000	NMeFOSAA	0.055	0.054	✓
NEtFOSAA_1	584.2 / 419.1	8.96	1074424.99	25.092	5763.9	8.95	d5-EtFOSAA	247093.89	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.96	1217621.26	25.048	130500.7	8.95	d5-EtFOSAA	247093.89	5.000	NEtFOSAA	1.133	1.117	✓
HFPO-DA_1	284.9 / 168.9	6.79	1978912.11	24.341	23310.5	6.78	13C3-HFPO-DA	346506.18	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.79	296486.87	24.927	1089.9	6.78	13C3-HFPO-DA	346506.18	5.000	HFPO-DA	0.150	0.154	✓
ADONA_1	376.9 / 250.9	7.45	20066017.41	25.172	24694.6	7.79	13C8-PFOA	2033520.10	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.45	43268.03	22.128	12823343.8	7.79	13C8-PFOA	2033520.10	5.000	ADONA	0.002	0.002	✓
9Cl-PF3ONS_1	530.8 / 351.0	9.28	6529560.67	25.061	13592.1	7.79	13C8-PFOA	2033520.10	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	9.28	2004266.17	24.033	8997.9	7.79	13C8-PFOA	2033520.10	5.000	9Cl-PF3ONS	0.307	0.337	✓
11Cl-PF3OUdS_1	630.9 / 450.9	10.18	15582408.18	24.104	9060.2	7.79	13C8-PFOA	2033520.10	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	10.18	4270905.00	21.630	8025.5	7.79	13C8-PFOA	2033520.10	5.000	11Cl-PF3OUdS	0.274	0.323	✓

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PFAS Calibration Quant Report

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Printed: 24/08/2023 8:43:50 AM

Sample Name	LZ90	**Injection Vial**	10
Sample ID	L8	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:33:58 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.52	15456186.50	50.312	8633.7	6.51	13C5-PFHxA	1225299.88	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.52	348066.33	49.468	4730.3	6.51	13C5-PFHxA	1225299.88	5.000	PFHxA	0.023	0.024	✓
PFHpA_1	363.1 / 319.0	7.25	24899847.36	51.283	4614.5	7.23	13C4-PFHpA	2065376.93	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	7.25	330930.77	51.953	55415.5	7.23	13C4-PFHpA	2065376.93	5.000	PFHpA	0.013	0.013	✓
PFOA_1	413.0 / 369.0	7.81	17556766.97	51.555	4067.8	7.79	13C8-PFOA	1667748.97	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.81	625584.04	52.024	17934.4	7.79	13C8-PFOA	1667748.97	5.000	PFOA	0.036	0.038	✓
PFNA_1	463.0 / 419.0	8.30	9435071.65	50.207	3504.7	8.29	13C9-PFNA	850848.29	5.000	PFNA			
PFNA_2	463.0 / 219.0	8.30	1370954.21	49.840	18327.2	8.29	13C9-PFNA	850848.29	5.000	PFNA	0.145	0.147	✓
PFDA_1	512.9 / 469.0	8.77	4652678.40	50.654	4355.1	8.75	13C6-PFDA	840031.20	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.77	124225.36	49.810	18142.5	8.75	13C6-PFDA	840031.20	5.000	PFDA	0.027	0.027	✓
PFUnA_1	563.1 / 519.0	9.23	12969991.42	52.247	3384.6	9.22	13C7-PFUnA	1333512.72	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	9.23	563400.14	50.397	8882.2	9.22	13C7-PFUnA	1333512.72	5.000	PFUnA	0.043	0.044	✓
PFDoA_1	613.1 / 569.0	9.69	8828585.00	50.102	4296.6	9.67	13C2-PFDoA	1484227.26	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.69	1521740.46	50.042	14327.5	9.67	13C2-PFDoA	1484227.26	5.000	PFDoA	0.172	0.180	✓
PFTrDA_1	663.0 / 619.0	10.13	10381651.00	49.208	3903.8	10.51	13C2-PFTeDA	983466.45	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	10.12	270371.73	48.326	19670.7	10.51	13C2-PFTeDA	983466.45	5.000	PFTrDA	0.026	0.025	✓
PFTeDA_1	713.0 / 669.0	10.53	7859782.50	48.799	3723.9	10.51	13C2-PFTeDA	983466.45	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	10.52	160860.10	49.426	3023.9	10.51	13C2-PFTeDA	983466.45	5.000	PFTeDA	0.021	0.022	✓
PFBS_1	298.7 / 79.9	6.48	539636.83	49.036	309813.6	6.46	13C3-PFBS	267760.01	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.48	603737.82	50.838	4203.5	6.46	13C3-PFBS	267760.01	4.660	PFBS	1.119	1.063	✓
PFHxS_1	399.0 / 80.0	7.94	2447007.55	51.366	20739.1	7.92	13C3-PFHxS	223298.99	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.93	850831.14	48.502	3332.5	7.92	13C3-PFHxS	223298.99	4.740	PFHxS	0.348	0.368	✓
PFOS_1	498.9 / 79.9	8.95	855446.16	51.468	3834.7	8.93	13C8-PFOS	125580.66	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.95	214934.42	51.858	464182.1	8.93	13C8-PFOS	125580.66	4.790	PFOS	0.251	0.268	✓
NMeFOSAA_1	570.1 / 419.0	8.78	1829367.30	49.719	15615.2	8.76	d3-MeFOSAA	225996.10	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.77	105905.91	51.677	8767.1	8.76	d3-MeFOSAA	225996.10	5.000	NMeFOSAA	0.058	0.054	✓
NEtFOSAA_1	584.2 / 419.1	8.96	1900913.66	50.714	37592.7	8.95	d5-EtFOSAA	216178.40	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.96	2190691.96	51.471	40053.4	8.95	d5-EtFOSAA	216178.40	5.000	NEtFOSAA	1.152	1.117	✓
HFPO-DA_1	284.9 / 168.9	6.79	3595403.61	51.781	11136.3	6.77	13C3-HFPO-DA	295846.35	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.79	513090.59	50.537	2096.3	6.77	13C3-HFPO-DA	295846.35	5.000	HFPO-DA	0.143	0.154	✓
ADONA_1	376.9 / 250.9	7.45	32259786.44	49.316	35087.8	7.79	13C8-PFOA	1667748.97	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.45	83214.09	51.825	133782.7	7.79	13C8-PFOA	1667748.97	5.000	ADONA	0.003	0.002	✓
9Cl-PF3ONS_1	530.8 / 351.0	9.28	10420040.28	48.764	10273.1	7.79	13C8-PFOA	1667748.97	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	9.28	3451556.93	50.492	36440.5	7.79	13C8-PFOA	1667748.97	5.000	9Cl-PF3ONS	0.331	0.337	✓
11Cl-PF3OUdS_1	630.9 / 450.9	10.18	27384462.90	51.523	11497.8	7.79	13C8-PFOA	1667748.97	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	10.18	8806279.36	54.272	8946.4	7.79	13C8-PFOA	1667748.97	5.000	11Cl-PF3OUdS	0.322	0.323	✓

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PFAS Calibration Quant Report

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Sample Name	LZ83	**Injection Vial**	3
Sample ID	L1	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.51	1841052.38	4.917	6004.4	7.79	13C2-PFOA	1814199.27	5.000				
13C4-PFHpA	367.1 / 322.0	7.22	3019826.31	4.926	8193.5	7.79	13C2-PFOA	1814199.27	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.79	2471888.54	5.137	34066.0	7.79	13C2-PFOA	1814199.27	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	8.29	1060293.99	4.678	54537.6	7.79	13C2-PFOA	1814199.27	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.76	1188542.50	5.161	7459.2	8.76	13C2-PFDA	869884.35	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	9.22	1737033.81	4.853	6628.0	8.76	13C2-PFDA	869884.35	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.68	2115890.92	5.028	7963.7	8.76	13C2-PFDA	869884.35	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.52	1195781.08	4.786	3607.1	8.76	13C2-PFDA	869884.35	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.46	426433.91	4.863	2309.1	8.94	13C4-PFOS	71958.99	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.92	311338.52	4.898	41784.6	8.94	13C4-PFOS	71958.99	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.94	171022.62	4.941	1217.0	8.94	13C4-PFOS	71958.99	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.77	303303.40	5.393	2437.0	8.94	13C4-PFOS	71958.99	4.790		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.95	294639.95	5.225	7417.9	8.94	13C4-PFOS	71958.99	4.790		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.77	363955.50	4.526	1256.1	7.79	13C2-PFOA	1814199.27	5.000		N/A	N/A	✓

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PFAS Calibration Quant Report

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Sample Name	LZ84	**Injection Vial**	4
Sample ID	L2	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:57:41 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.51	2034195.53	5.096	7758.3	7.79	13C2-PFOA	1934236.80	5.000				
13C4-PFHpA	367.1 / 322.0	7.23	3391707.39	5.189	13505.9	7.79	13C2-PFOA	1934236.80	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.79	2640979.61	5.148	16568.1	7.79	13C2-PFOA	1934236.80	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	8.29	1127781.51	4.667	9251.3	7.79	13C2-PFOA	1934236.80	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.76	1223969.81	5.130	28454.8	8.75	13C2-PFDA	901095.35	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	9.22	1983876.07	5.351	5721.8	8.75	13C2-PFDA	901095.35	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.68	2165943.06	4.969	6467.0	8.75	13C2-PFDA	901095.35	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.51	1259706.79	4.868	3622.3	8.75	13C2-PFDA	901095.35	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.47	481031.41	4.727	2568.2	8.94	13C4-PFOS	83509.09	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.92	371611.06	5.038	5223.6	8.94	13C4-PFOS	83509.09	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.94	181095.64	4.508	15962.7	8.94	13C4-PFOS	83509.09	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.77	292258.71	4.478	2461.7	8.94	13C4-PFOS	83509.09	4.790		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.95	334757.63	5.115	26487.0	8.94	13C4-PFOS	83509.09	4.790		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.78	415716.55	4.849	2039.9	7.79	13C2-PFOA	1934236.80	5.000		N/A	N/A	✓

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PFAS Calibration Quant Report

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Sample Name	LZ85	**Injection Vial**	5
Sample ID	L3	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 6:13:44 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.51	1873187.43	5.258	4970.0	7.79	13C2-PFOA	1726185.21	5.000				
13C4-PFHpA	367.1 / 322.0	7.23	3028282.18	5.192	12967.0	7.79	13C2-PFOA	1726185.21	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.79	2277010.28	4.973	18606.7	7.79	13C2-PFOA	1726185.21	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	8.29	1077801.74	4.998	31772893.7	7.79	13C2-PFOA	1726185.21	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.76	1126719.00	5.125	4956.6	8.75	13C2-PFDA	830336.19	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	9.22	1730066.48	5.064	5323.8	8.75	13C2-PFDA	830336.19	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.68	2074480.67	5.164	6202.8	8.75	13C2-PFDA	830336.19	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.52	1221482.21	5.122	4727.1	8.75	13C2-PFDA	830336.19	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.47	445317.29	5.020	1889.7	8.94	13C4-PFOS	72789.17	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.92	276302.09	4.297	9088.2	8.94	13C4-PFOS	72789.17	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.94	171179.31	4.889	2505.0	8.94	13C4-PFOS	72789.17	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.77	274087.01	4.818	2009.9	8.94	13C4-PFOS	72789.17	4.790		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.95	271079.25	4.752	46673.6	8.94	13C4-PFOS	72789.17	4.790		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.78	385715.66	5.042	664448.1	7.79	13C2-PFOA	1726185.21	5.000		N/A	N/A	✓

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PFAS Calibration Quant Report

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Sample Name	LZ86	**Injection Vial**	6
Sample ID	L4	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 6:29:47 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.51	1893303.87	4.870	5443.9	7.79	13C2-PFOA	1883815.12	5.000				
13C4-PFHpA	367.1 / 322.0	7.23	2956255.55	4.644	12920.8	7.79	13C2-PFOA	1883815.12	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.79	2408006.02	4.819	52659.7	7.79	13C2-PFOA	1883815.12	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	8.29	1132637.64	4.813	8892.2	7.79	13C2-PFOA	1883815.12	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.76	1148535.44	5.321	38175.3	8.76	13C2-PFDA	815300.50	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	9.22	1724279.87	5.140	5593.2	8.76	13C2-PFDA	815300.50	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.68	2181781.01	5.532	16263.7	8.76	13C2-PFDA	815300.50	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.52	1207561.08	5.157	4305.6	8.76	13C2-PFDA	815300.50	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.46	449207.34	4.769	2317.1	8.94	13C4-PFOS	77295.47	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.92	320620.66	4.696	7984.9	8.94	13C4-PFOS	77295.47	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.94	167343.60	4.501	2501.8	8.94	13C4-PFOS	77295.47	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.77	298631.38	4.943	2023.9	8.94	13C4-PFOS	77295.47	4.790		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.95	283854.75	4.686	3390.0	8.94	13C4-PFOS	77295.47	4.790		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.78	395094.94	4.732	3101.7	7.79	13C2-PFOA	1883815.12	5.000		N/A	N/A	✓

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PFAS Calibration Quant Report

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Sample Name	LZ87	**Injection Vial**	7
Sample ID	L5	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 6:45:50 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.51	1990896.86	5.169	7232.7	7.79	13C2-PFOA	1866054.52	5.000				
13C4-PFHpA	367.1 / 322.0	7.23	3066787.55	4.864	9326.9	7.79	13C2-PFOA	1866054.52	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.79	2442551.52	4.935	5431440.0	7.79	13C2-PFOA	1866054.52	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	8.29	1148711.97	4.928	12636.4	7.79	13C2-PFOA	1866054.52	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.76	1175751.89	5.035	14256.8	8.76	13C2-PFDA	881908.07	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	9.23	1834122.68	5.054	4095.5	8.76	13C2-PFDA	881908.07	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.68	2222384.02	5.209	6432.6	8.76	13C2-PFDA	881908.07	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.52	1294125.20	5.109	5157.1	8.76	13C2-PFDA	881908.07	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.47	465767.42	4.919	2455.4	8.94	13C4-PFOS	77695.04	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.92	321470.46	4.684	133368.7	8.94	13C4-PFOS	77695.04	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.95	178536.66	4.777	2502.7	8.94	13C4-PFOS	77695.04	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.77	305819.19	5.036	3204.4	8.94	13C4-PFOS	77695.04	4.790		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.95	301036.19	4.944	3853.4	8.94	13C4-PFOS	77695.04	4.790		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.78	408380.87	4.938	4814083.7	7.79	13C2-PFOA	1866054.52	5.000		N/A	N/A	✓

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PFAS Calibration Quant Report

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Sample Name	LZ88	**Injection Vial**	8
Sample ID	L6	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:01:53 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.51	1732686.18	5.153	7398.0	7.78	13C2-PFOA	1629307.43	5.000				
13C4-PFHpA	367.1 / 322.0	7.23	2840428.96	5.159	11697.6	7.78	13C2-PFOA	1629307.43	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.79	2041444.79	4.724	7354.3	7.78	13C2-PFOA	1629307.43	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	8.28	1077251.16	5.293	2398.2	7.78	13C2-PFOA	1629307.43	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.75	1031991.22	4.273	225931.6	8.75	13C2-PFDA	912246.66	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	9.22	1690151.52	4.503	6477.7	8.75	13C2-PFDA	912246.66	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.68	1883253.94	4.267	6541.7	8.75	13C2-PFDA	912246.66	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.51	1206394.91	4.605	8924.4	8.75	13C2-PFDA	912246.66	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.46	382640.92	4.484	2133.5	8.93	13C4-PFOS	70027.35	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.92	296007.63	4.785	3481.1	8.93	13C4-PFOS	70027.35	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.94	162256.11	4.817	1703.0	8.93	13C4-PFOS	70027.35	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.76	261054.40	4.770	3393.5	8.93	13C4-PFOS	70027.35	4.790		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.95	279859.08	5.100	19396.9	8.93	13C4-PFOS	70027.35	4.790		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.78	377942.78	5.234	19317578.8	7.78	13C2-PFOA	1629307.43	5.000		N/A	N/A	✓

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PFAS Calibration Quant Report

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Sample Name	LZ89	**Injection Vial**	9
Sample ID	L7	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:17:57 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.51	1447378.66	4.754	6557.4	7.79	13C2-PFOA	1475181.23	5.000				
13C4-PFHpA	367.1 / 322.0	7.23	2542327.75	5.100	9483.9	7.79	13C2-PFOA	1475181.23	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.79	2033520.10	5.197	18967.6	7.79	13C2-PFOA	1475181.23	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	8.29	946220.01	5.135	606037.2	7.79	13C2-PFOA	1475181.23	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.75	982341.84	5.182	8136.4	8.75	13C2-PFDA	715944.16	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	9.22	1520246.79	5.161	7232.6	8.75	13C2-PFDA	715944.16	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.68	1806461.21	5.216	20052.3	8.75	13C2-PFDA	715944.16	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.51	1069643.05	5.202	3612.3	8.75	13C2-PFDA	715944.16	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.47	336365.08	4.361	2134.2	8.93	13C4-PFOS	63289.98	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.92	266217.94	4.762	2594.2	8.93	13C4-PFOS	63289.98	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.94	151323.07	4.971	1543.2	8.93	13C4-PFOS	63289.98	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.77	253158.07	5.118	6211.8	8.93	13C4-PFOS	63289.98	4.790		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.95	247093.89	4.982	5425.9	8.93	13C4-PFOS	63289.98	4.790		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.78	346506.18	5.300	4090.5	7.79	13C2-PFOA	1475181.23	5.000		N/A	N/A	✓

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PFAS Calibration Quant Report

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Sample Name	LZ90	**Injection Vial**	10
Sample ID	L8	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:33:58 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.51	1225299.88	4.784	4026.5	7.79	13C2-PFOA	1241023.33	5.000				
13C4-PFHpA	367.1 / 322.0	7.23	2065376.93	4.925	8235.2	7.79	13C2-PFOA	1241023.33	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.79	1667748.97	5.067	78231.3	7.79	13C2-PFOA	1241023.33	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	8.29	850848.29	5.488	2420.6	7.79	13C2-PFOA	1241023.33	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.75	840031.20	4.772	4820.5	8.75	13C2-PFDA	664825.58	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	9.22	1333512.72	4.875	10821.4	8.75	13C2-PFDA	664825.58	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.67	1484227.26	4.615	12968.3	8.75	13C2-PFDA	664825.58	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.51	983466.45	5.151	7293.7	8.75	13C2-PFDA	664825.58	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.46	267760.01	4.137	2208.6	8.94	13C4-PFOS	53110.03	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.92	223298.99	4.760	278987.4	8.94	13C4-PFOS	53110.03	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.93	125580.66	4.916	1039.5	8.94	13C4-PFOS	53110.03	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.76	225996.10	5.444	2210.3	8.94	13C4-PFOS	53110.03	4.790		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.95	216178.40	5.194	2154.8	8.94	13C4-PFOS	53110.03	4.790		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.77	295846.35	5.379	2269.5	7.79	13C2-PFOA	1241023.33	5.000		N/A	N/A	✓

Sample Name	LZ92 ICC	**Injection Vial**	12
Sample ID	ICC	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 8:05:55 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/mL)	Target Conc. (ng/mL)	Recovery (%)
PFHxA_1	313.0 / 269.0	6.52	2.499	2.500	99.95
PFHxA_2	313.0 / 118.9	6.52	2.802	2.500	112.09
PFHpA_1	363.1 / 319.0	7.25	2.363	2.500	94.53
PFHpA_2	363.1 / 169.0	7.25	2.588	2.500	103.50
PFOA_1	413.0 / 369.0	7.81	2.726	2.500	109.03
PFOA_2	413.0 / 169.0	7.81	2.674	2.500	106.95
PFNA_1	463.0 / 419.0	8.30	2.481	2.500	99.22
PFNA_2	463.0 / 219.0	8.30	2.805	2.500	112.19
PFDA_1	512.9 / 469.0	8.77	2.678	2.500	107.12
PFDA_2	512.9 / 219.0	8.78	1.890	2.500	75.62
PFUnA_1	563.1 / 519.0	9.23	2.389	2.500	95.54
PFUnA_2	563.1 / 269.1	9.23	2.659	2.500	106.38
PFDoA_1	613.1 / 569.0	9.69	2.671	2.500	106.82
PFDoA_2	613.1 / 319.0	9.69	2.932	2.500	117.28
PFTrDA_1	663.0 / 619.0	10.12	2.712	2.500	108.48
PFTrDA_2	663.0 / 168.9	10.12	3.082	2.500	123.27
PFTeDA_1	713.0 / 669.0	10.52	2.698	2.500	107.93
PFTeDA_2	713.0 / 168.9	10.52	3.385	2.500	135.41
PFBS_1	298.7 / 79.9	6.48	2.673	2.500	106.91
PFBS_2	298.9 / 98.8	6.47	2.864	2.500	114.56
PFHxS_1	399.0 / 80.0	7.93	2.657	2.500	106.30
PFHxS_2	399.0 / 99.0	7.93	2.866	2.500	114.64
PFOS_1	498.9 / 79.9	8.95	3.019	2.500	120.75
PFOS_2	498.9 / 98.9	8.95	3.180	2.500	127.22
NMeFOSAA_1	570.1 / 419.0	8.77	2.775	2.500	110.99
NMeFOSAA_2	570.1 / 483.0	8.77	3.391	2.500	135.65
NEtFOSAA_1	584.2 / 419.1	8.95	2.276	2.500	91.06
NEtFOSAA_2	584.2 / 526.0	8.96	2.312	2.500	92.47
HFPO-DA_1	284.9 / 168.9	6.79	2.613	2.500	104.53
HFPO-DA_2	284.9 / 184.9	6.78	2.909	2.500	116.37
ADONA_1	376.9 / 250.9	7.44	2.769	2.500	110.75
ADONA_2	376.9 / 84.8	7.45	2.379	2.500	95.15
9Cl-PF3ONS_1	530.8 / 351.0	9.27	2.706	2.500	108.23
9Cl-PF3ONS_2	532.8 / 353.0	9.27	2.913	2.500	116.52
11Cl-PF3OUdS_1	630.9 / 450.9	10.17	2.860	2.500	114.39
11Cl-PF3OUdS_2	632.9 / 452.9	10.17	2.656	2.500	106.25

Sample Name	LZ87 CCV	**Injection Vial**	24
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 11:18:41 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/mL)	Target Conc. (ng/mL)	Recovery (%)
PFHxA_1	313.0 / 269.0	6.51	2.126	2.500	85.04
PFHxA_2	313.0 / 118.9	6.51	2.325	2.500	93.00
PFHpA_1	363.1 / 319.0	7.23	2.149	2.500	85.96
PFHpA_2	363.1 / 169.0	7.23	2.621	2.500	104.86
PFOA_1	413.0 / 369.0	7.80	2.321	2.500	92.83
PFOA_2	413.0 / 169.0	7.80	2.482	2.500	99.29
PFNA_1	463.0 / 419.0	8.29	2.093	2.500	83.73
PFNA_2	463.0 / 219.0	8.28	2.353	2.500	94.12
PFDA_1	512.9 / 469.0	8.75	2.345	2.500	93.80
PFDA_2	512.9 / 219.0	8.75	1.780	2.500	71.19
PFUnA_1	563.1 / 519.0	9.22	2.125	2.500	84.99
PFUnA_2	563.1 / 269.1	9.22	2.481	2.500	99.24
PFDoA_1	613.1 / 569.0	9.68	2.453	2.500	98.11
PFDoA_2	613.1 / 319.0	9.67	2.300	2.500	92.02
PFTrDA_1	663.0 / 619.0	10.11	2.398	2.500	95.93
PFTrDA_2	663.0 / 168.9	10.11	2.727	2.500	109.07
PFTeDA_1	713.0 / 669.0	10.51	2.293	2.500	91.71
PFTeDA_2	713.0 / 168.9	10.51	2.078	2.500	83.12
PFBS_1	298.7 / 79.9	6.46	2.727	2.500	109.07
PFBS_2	298.9 / 98.8	6.46	2.321	2.500	92.86
PFHxS_1	399.0 / 80.0	7.92	2.358	2.500	94.33
PFHxS_2	399.0 / 99.0	7.92	2.385	2.500	95.39
PFOS_1	498.9 / 79.9	8.93	2.532	2.500	101.26
PFOS_2	498.9 / 98.9	8.93	2.178	2.500	87.13
NMeFOSAA_1	570.1 / 419.0	8.76	2.690	2.500	107.60
NMeFOSAA_2	570.1 / 483.0	8.76	2.268	2.500	90.74
NEtFOSAA_1	584.2 / 419.1	8.94	2.273	2.500	90.90
NEtFOSAA_2	584.2 / 526.0	8.94	2.242	2.500	89.70
HFPO-DA_1	284.9 / 168.9	6.78	2.336	2.500	93.46
HFPO-DA_2	284.9 / 184.9	6.78	2.430	2.500	97.20
ADONA_1	376.9 / 250.9	7.44	2.390	2.500	95.60
ADONA_2	376.9 / 84.8	7.44	2.117	2.500	84.69
9Cl-PF3ONS_1	530.8 / 351.0	9.26	2.397	2.500	95.88
9Cl-PF3ONS_2	532.8 / 353.0	9.26	2.475	2.500	98.99
11Cl-PF3OUdS_1	630.9 / 450.9	10.16	1.831	2.500	73.25
11Cl-PF3OUdS_2	632.9 / 452.9	10.16	2.169	2.500	86.76

Sample Name	LZ92 ICC	**Injection Vial**	12
Sample ID	ICC	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 8:05:55 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/mL)	Target Conc. (ng/mL)	Recovery (%)
13C5-PFHxA	318.0 / 273.0	6.50	5.153	5.000	103.05
13C4-PFHpA	367.1 / 322.0	7.23	5.339	5.000	106.77
13C8-PFOA	421.1 / 376.0	7.79	4.685	5.000	93.69
13C9-PFNA	472.1 / 427.0	8.28	5.155	5.000	103.11
13C6-PFDA	519.1 / 474.1	8.75	4.842	5.000	96.85
13C7-PFUnA	570.0 / 525.1	9.21	4.870	5.000	97.40
13C2-PFDoA	615.1 / 570.0	9.67	4.830	5.000	96.61
13C2-PFTeDA	715.2 / 670.0	10.51	4.712	5.000	94.25
13C3-PFBS	302.1 / 79.9	6.46	4.749	4.660	101.91
13C3-PFHxS	402.1 / 79.9	7.91	4.971	4.740	104.86
13C8-PFOS	507.1 / 79.9	8.93	4.551	4.790	95.00
d3-MeFOSAA	573.2 / 419.0	8.76	4.723	5.000	94.47
d5-EtFOSAA	589.2 / 419.0	8.94	5.145	5.000	102.89
13C3-HFPO-DA	286.9 / 168.9	6.77	4.752	5.000	95.04

Sample Name	LZ87 CCV	**Injection Vial**	24
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 11:18:41 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/mL)	Target Conc. (ng/mL)	Recovery (%)
13C5-PFHxA	318.0 / 273.0	6.49	5.048	5.000	100.96
13C4-PFHpA	367.1 / 322.0	7.22	5.134	5.000	102.68
13C8-PFOA	421.1 / 376.0	7.78	4.800	5.000	95.99
13C9-PFNA	472.1 / 427.0	8.27	5.056	5.000	101.12
13C6-PFDA	519.1 / 474.1	8.74	4.890	5.000	97.79
13C7-PFUnA	570.0 / 525.1	9.20	4.797	5.000	95.94
13C2-PFDoA	615.1 / 570.0	9.66	5.092	5.000	101.84
13C2-PFTeDA	715.2 / 670.0	10.49	4.850	5.000	97.01
13C3-PFBS	302.1 / 79.9	6.45	4.654	4.660	99.86
13C3-PFHxS	402.1 / 79.9	7.90	4.497	4.740	94.88
13C8-PFOS	507.1 / 79.9	8.92	4.223	4.790	88.16
d3-MeFOSAA	573.2 / 419.0	8.75	4.593	5.000	91.86
d5-EtFOSAA	589.2 / 419.0	8.93	4.776	5.000	95.52
13C3-HFPO-DA	286.9 / 168.9	6.76	4.817	5.000	96.34

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PFAS QC Sample Quant Report

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Sample Name	LZ92 ICC	**Injection Vial**	12
Sample ID	ICC	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 8:05:55 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.52	1032787.25	2.499	2280.3	6.50	13C5-PFHxA	1674307.70	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.52	26837.40	2.802	1392.0	6.50	13C5-PFHxA	1674307.70	5.000	PFHxA	0.026	0.024	✓
PFHpA_1	363.1 / 319.0	7.25	1561364.93	2.363	1350.2	7.23	13C4-PFHpA	2840208.70	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	7.25	22494.49	2.588	3077.6	7.23	13C4-PFHpA	2840208.70	5.000	PFHpA	0.014	0.013	✓
PFOA_1	413.0 / 369.0	7.81	1082642.64	2.726	1239.4	7.79	13C8-PFOA	1956292.98	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.81	37909.19	2.674	253287.2	7.79	13C8-PFOA	1956292.98	5.000	PFOA	0.035	0.038	✓
PFNA_1	463.0 / 419.0	8.30	550782.19	2.481	998.7	8.28	13C9-PFNA	1013977.38	5.000	PFNA			
PFNA_2	463.0 / 219.0	8.30	91216.52	2.805	4306.5	8.28	13C9-PFNA	1013977.38	5.000	PFNA	0.166	0.147	✓
PFDA_1	512.9 / 469.0	8.77	293816.64	2.678	816.3	8.75	13C6-PFDA	1016481.51	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.78	5602.77	1.890	3515.7	8.75	13C6-PFDA	1016481.51	5.000	PFDA	0.019	0.027	✓
PFUnA_1	563.1 / 519.0	9.23	698821.83	2.389	998.4	9.21	13C7-PFUnA	1588678.25	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	9.23	34929.20	2.659	2490284.5	9.21	13C7-PFUnA	1588678.25	5.000	PFUnA	0.050	0.044	✓
PFDoA_1	613.1 / 569.0	9.69	479142.26	2.671	1204.0	9.67	13C2-PFDoA	1852629.08	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.69	92603.23	2.932	3594.1	9.67	13C2-PFDoA	1852629.08	5.000	PFDoA	0.193	0.180	✓
PFTrDA_1	663.0 / 619.0	10.12	624586.71	2.712	1310.3	10.51	13C2-PFTeDA	1073039.30	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	10.12	18697.81	3.082	250124.2	10.51	13C2-PFTeDA	1073039.30	5.000	PFTrDA	0.030	0.025	✓
PFTeDA_1	713.0 / 669.0	10.52	475809.96	2.698	1281.3	10.51	13C2-PFTeDA	1073039.30	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	10.52	12182.06	3.385	2638.0	10.51	13C2-PFTeDA	1073039.30	5.000	PFTeDA	0.026	0.022	✓
PFBS_1	298.7 / 79.9	6.48	43338.49	2.673	1175.7	6.46	13C3-PFBS	390283.56	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.47	49899.43	2.864	1187.7	6.46	13C3-PFBS	390283.56	4.660	PFBS	1.151	1.063	✓
PFHxS_1	399.0 / 80.0	7.93	168089.72	2.657	7237.2	7.91	13C3-PFHxS	296104.56	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.93	66726.57	2.866	2353.3	7.91	13C3-PFHxS	296104.56	4.740	PFHxS	0.397	0.368	✓
PFOS_1	498.9 / 79.9	8.95	59758.63	3.019	82333.7	8.93	13C8-PFOS	147621.53	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.95	15885.72	3.180	1113.2	8.93	13C8-PFOS	147621.53	4.790	PFOS	0.266	0.268	✓
NMeFOSAA_1	570.1 / 419.0	8.77	111809.10	2.775	583.4	8.76	d3-MeFOSAA	248962.46	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.77	7575.50	3.391	323.1	8.76	d3-MeFOSAA	248962.46	5.000	NMeFOSAA	0.068	0.054	✓
NEtFOSAA_1	584.2 / 419.1	8.95	106057.99	2.276	1311015.6	8.94	d5-EtFOSAA	271888.47	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.96	121860.52	2.312	714.6	8.94	d5-EtFOSAA	271888.47	5.000	NEtFOSAA	1.149	1.117	✓
HFPO-DA_1	284.9 / 168.9	6.79	202336.69	2.613	3105.1	6.77	13C3-HFPO-DA	331599.33	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.78	33245.64	2.909	538.0	6.77	13C3-HFPO-DA	331599.33	5.000	HFPO-DA	0.164	0.154	✓
ADONA_1	376.9 / 250.9	7.44	2103957.88	2.769	16442.3	7.79	13C8-PFOA	1956292.98	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.45	4391.51	2.379	5644.1	7.79	13C8-PFOA	1956292.98	5.000	ADONA	0.002	0.002	✓
9Cl-PF3ONS_1	530.8 / 351.0	9.27	678097.34	2.706	15973.2	7.79	13C8-PFOA	1956292.98	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	9.27	235477.78	2.913	394619.8	7.79	13C8-PFOA	1956292.98	5.000	9Cl-PF3ONS	0.347	0.337	✓
11Cl-PF3OUdS_1	630.9 / 450.9	10.17	1716772.08	2.860	3000.6	7.79	13C8-PFOA	1956292.98	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	10.17	492630.73	2.656	2837.1	7.79	13C8-PFOA	1956292.98	5.000	11Cl-PF3OUdS	0.287	0.323	✓

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PFAS QC Sample Quant Report

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Sample Name	LZ87 CCV	**Injection Vial**	24
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 11:18:41 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.51	876438.95	2.126	1152.9	6.49	13C5-PFHxA	1674647.90	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.51	22250.55	2.325	532.7	6.49	13C5-PFHxA	1674647.90	5.000	PFHxA	0.025	0.024	✓
PFHpA_1	363.1 / 319.0	7.23	1392578.19	2.149	1198.5	7.22	13C4-PFHpA	2788635.42	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	7.23	22376.71	2.621	2184.9	7.22	13C4-PFHpA	2788635.42	5.000	PFHpA	0.016	0.013	✓
PFOA_1	413.0 / 369.0	7.80	963204.31	2.321	1244.7	7.78	13C8-PFOA	2046322.94	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.80	36827.91	2.482	3937.4	7.78	13C8-PFOA	2046322.94	5.000	PFOA	0.038	0.038	✓
PFNA_1	463.0 / 419.0	8.29	464592.90	2.093	807.3	8.27	13C9-PFNA	1015254.47	5.000	PFNA			
PFNA_2	463.0 / 219.0	8.28	76497.81	2.353	540928.2	8.27	13C9-PFNA	1015254.47	5.000	PFNA	0.165	0.147	✓
PFDA_1	512.9 / 469.0	8.75	247955.63	2.345	729.3	8.74	13C6-PFDA	981517.20	5.000	PFDA			
PFDA_2	512.9 / 219.0	8.75	5087.59	1.780	552352.6	8.74	13C6-PFDA	981517.20	5.000	PFDA	0.021	0.027	✓
PFUnA_1	563.1 / 519.0	9.22	584739.86	2.125	1322.0	9.20	13C7-PFUnA	1496466.93	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	9.22	30662.11	2.481	7042.2	9.20	13C7-PFUnA	1496466.93	5.000	PFUnA	0.052	0.044	✓
PFDoA_1	613.1 / 569.0	9.68	443231.94	2.453	1044.0	9.66	13C2-PFDoA	1867519.97	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.67	73188.42	2.300	8914.0	9.66	13C2-PFDoA	1867519.97	5.000	PFDoA	0.165	0.180	✓
PFTrDA_1	663.0 / 619.0	10.11	543700.84	2.398	941.3	10.49	13C2-PFTeDA	1056150.21	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	10.11	16268.29	2.727	1922.5	10.49	13C2-PFTeDA	1056150.21	5.000	PFTrDA	0.030	0.025	✓
PFTeDA_1	713.0 / 669.0	10.51	398212.79	2.293	1484.8	10.49	13C2-PFTeDA	1056150.21	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	10.51	7425.64	2.078	778.0	10.49	13C2-PFTeDA	1056150.21	5.000	PFTeDA	0.019	0.022	✓
PFBS_1	298.7 / 79.9	6.46	45287.85	2.727	3099.9	6.45	13C3-PFBS	399835.12	4.660	PFBS			
PFBS_2	298.9 / 98.8	6.46	41499.80	2.321	992.3	6.45	13C3-PFBS	399835.12	4.660	PFBS	0.916	1.063	✓
PFHxS_1	399.0 / 80.0	7.92	141110.78	2.358	1812.1	7.90	13C3-PFHxS	280081.07	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.92	52527.87	2.385	1201.3	7.90	13C3-PFHxS	280081.07	4.740	PFHxS	0.372	0.368	✓
PFOS_1	498.9 / 79.9	8.93	48747.15	2.532	723.1	8.92	13C8-PFOS	143216.35	4.790	PFOS			
PFOS_2	498.9 / 98.9	8.93	10682.33	2.178	127.2	8.92	13C8-PFOS	143216.35	4.790	PFOS	0.219	0.268	✓
NMeFOSAA_1	570.1 / 419.0	8.76	110179.10	2.690	30977.7	8.75	d3-MeFOSAA	253099.03	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.76	5122.59	2.268	127.3	8.75	d3-MeFOSAA	253099.03	5.000	NMeFOSAA	0.047	0.054	✓
NEtFOSAA_1	584.2 / 419.1	8.94	102745.95	2.273	982.6	8.93	d5-EtFOSAA	263852.67	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.94	114651.45	2.242	179703.4	8.93	d5-EtFOSAA	263852.67	5.000	NEtFOSAA	1.116	1.117	✓
HFPO-DA_1	284.9 / 168.9	6.78	187097.60	2.336	4585.8	6.76	13C3-HFPO-DA	343153.17	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.78	28761.47	2.430	596.9	6.76	13C3-HFPO-DA	343153.17	5.000	HFPO-DA	0.154	0.154	✓
ADONA_1	376.9 / 250.9	7.44	1896579.89	2.390	6937.6	7.78	13C8-PFOA	2046322.94	5.000	ADONA			
ADONA_2	376.9 / 84.8	7.44	4077.75	2.117	482.2	7.78	13C8-PFOA	2046322.94	5.000	ADONA	0.002	0.002	✓
9Cl-PF3ONS_1	530.8 / 351.0	9.26	628367.47	2.397	373849.1	7.78	13C8-PFOA	2046322.94	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	9.26	209573.86	2.475	73986.0	7.78	13C8-PFOA	2046322.94	5.000	9Cl-PF3ONS	0.334	0.337	✓
11Cl-PF3OUdS_1	630.9 / 450.9	10.16	1123644.50	1.831	4508.3	7.78	13C8-PFOA	2046322.94	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	10.16	418177.86	2.169	4078.5	7.78	13C8-PFOA	2046322.94	5.000	11Cl-PF3OUdS	0.372	0.323	✓

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PFAS QC Sample Quant Report

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Sample Name	LZ92 ICC	**Injection Vial**	12
Sample ID	ICC	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 8:05:55 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.50	1674307.70	5.153	5592.8	7.78	13C2-PFOA	1574414.89	5.000				
13C4-PFHpA	367.1 / 322.0	7.23	2840208.70	5.339	48824.7	7.78	13C2-PFOA	1574414.89	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.79	1956292.98	4.685	5498.6	7.78	13C2-PFOA	1574414.89	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	8.28	1013977.38	5.155	491392.8	7.78	13C2-PFOA	1574414.89	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.75	1016481.51	4.842	4258.5	8.74	13C2-PFDA	792833.63	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	9.21	1588678.25	4.870	11425.7	8.74	13C2-PFDA	792833.63	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.67	1852629.08	4.830	9209.9	8.74	13C2-PFDA	792833.63	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.51	1073039.30	4.712	7342.0	8.74	13C2-PFDA	792833.63	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.46	390283.56	4.749	2172.0	8.93	13C4-PFOS	67440.08	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.91	296104.56	4.971	10422.7	8.93	13C4-PFOS	67440.08	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.93	147621.53	4.551	2829.3	8.93	13C4-PFOS	67440.08	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.76	248962.46	4.723	1727.4	8.93	13C4-PFOS	67440.08	4.790		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.94	271888.47	5.145	747701.1	8.93	13C4-PFOS	67440.08	4.790		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.77	331599.33	4.752	4010357.1	7.78	13C2-PFOA	1574414.89	5.000		N/A	N/A	✓

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PFAS QC Sample Quant Report

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Sample Name	LZ87 CCV	**Injection Vial**	24
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 11:18:41 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/mL)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng/mL)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.49	1674647.90	5.048	9801.8	7.77	13C2-PFOA	1607399.01	5.000				
13C4-PFHpA	367.1 / 322.0	7.22	2788635.42	5.134	10836.8	7.77	13C2-PFOA	1607399.01	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.78	2046322.94	4.800	111217.3	7.77	13C2-PFOA	1607399.01	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	8.27	1015254.47	5.056	13860.1	7.77	13C2-PFOA	1607399.01	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.74	981517.20	4.890	4808.4	8.73	13C2-PFDA	758162.16	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	9.20	1496466.93	4.797	120229.4	8.73	13C2-PFDA	758162.16	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.66	1867519.97	5.092	4821.6	8.73	13C2-PFDA	758162.16	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.49	1056150.21	4.850	6654.8	8.73	13C2-PFDA	758162.16	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.45	399835.12	4.654	2697.1	8.92	13C4-PFOS	70503.02	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.90	280081.07	4.497	3359.4	8.92	13C4-PFOS	70503.02	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.92	143216.35	4.223	1886.2	8.92	13C4-PFOS	70503.02	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.75	253099.03	4.593	3951.5	8.92	13C4-PFOS	70503.02	4.790		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.93	263852.67	4.776	4050.1	8.92	13C4-PFOS	70503.02	4.790		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.76	343153.17	4.817	1586.3	7.77	13C2-PFOA	1607399.01	5.000		N/A	N/A	✓

Raw Analytical Data

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PFAS Sample Quant Report

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Printed: 24/08/2023 8:45:17 AM

Sample Name	LZ91 IB	**Injection Vial**	11
Sample ID	Instrument Blank	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:49:57 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.53	2297.39	0.045	15.5	6.51	13C5-PFHxA	1802833.42	5.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.58	90.86	0.020	47.3	6.51	13C5-PFHxA	1802833.42	5.000	PFHxA	0.040	0.024	
PFHpA_1	363.1 / 319.0	N/A	N/A	N/A	N/A	7.23	13C4-PFHpA	3107994.38	5.000	PFHpA			
PFHpA_2	363.1 / 169.0	N/A	N/A	N/A	N/A	7.23	13C4-PFHpA	3107994.38	5.000	PFHpA	N/A	0.013	✓
PFOA_1	413.0 / 369.0	7.82	6044.92	0.029	29.6	7.79	13C8-PFOA	2258918.85	5.000	PFOA			
PFOA_2	413.0 / 169.0	7.82	390.23	0.009	444.1	7.79	13C8-PFOA	2258918.85	5.000	PFOA	0.065	0.038	
PFNA_1	463.0 / 419.0	N/A	N/A	N/A	N/A	8.29	13C9-PFNA	1062564.64	5.000	PFNA			
PFNA_2	463.0 / 219.0	N/A	N/A	N/A	N/A	8.29	13C9-PFNA	1062564.64	5.000	PFNA	N/A	0.147	✓
PFDA_1	512.9 / 469.0	N/A	N/A	N/A	N/A	8.76	13C6-PFDA	1050625.72	5.000	PFDA			
PFDA_2	512.9 / 219.0	N/A	N/A	N/A	N/A	8.76	13C6-PFDA	1050625.72	5.000	PFDA	N/A	0.027	✓
PFUnA_1	563.1 / 519.0	N/A	N/A	N/A	N/A	9.22	13C7-PFUnA	1721003.50	5.000	PFUnA			
PFUnA_2	563.1 / 269.1	N/A	N/A	N/A	N/A	9.22	13C7-PFUnA	1721003.50	5.000	PFUnA	N/A	0.044	✓
PFDoA_1	613.1 / 569.0	N/A	N/A	N/A	N/A	9.68	13C2-PFDoA	1922637.05	5.000	PFDoA			
PFDoA_2	613.1 / 319.0	N/A	N/A	N/A	N/A	9.68	13C2-PFDoA	1922637.05	5.000	PFDoA	N/A	0.180	✓
PFTrDA_1	663.0 / 619.0	N/A	N/A	N/A	N/A	10.51	13C2-PFTeDA	1138143.74	5.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	N/A	N/A	N/A	N/A	10.51	13C2-PFTeDA	1138143.74	5.000	PFTrDA	N/A	0.025	✓
PFTeDA_1	713.0 / 669.0	10.53	2517.03	0.004	19.0	10.51	13C2-PFTeDA	1138143.74	5.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	N/A	N/A	N/A	N/A	10.51	13C2-PFTeDA	1138143.74	5.000	PFTeDA	N/A	0.022	
PFBS_1	298.7 / 79.9	N/A	N/A	N/A	N/A	6.46	13C3-PFBS	428952.71	4.660	PFBS			
PFBS_2	298.9 / 98.8	N/A	N/A	N/A	N/A	6.46	13C3-PFBS	428952.71	4.660	PFBS	N/A	1.063	✓
PFHxS_1	399.0 / 80.0	7.98	554.18	0.005	492.5	7.92	13C3-PFHxS	297693.09	4.740	PFHxS			
PFHxS_2	399.0 / 99.0	7.90	190.25	0.005	12.2	7.92	13C3-PFHxS	297693.09	4.740	PFHxS	0.343	0.368	✓
PFOS_1	498.9 / 79.9	8.91	460.04	< 0	125.5	8.94	13C8-PFOS	158597.64	4.790	PFOS			
PFOS_2	498.9 / 98.9	N/A	N/A	N/A	N/A	8.94	13C8-PFOS	158597.64	4.790	PFOS	N/A	0.268	
NMeFOSAA_1	570.1 / 419.0	8.77	193.75	0.021	1970.3	8.77	d3-MeFOSAA	291351.28	5.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	N/A	N/A	N/A	N/A	8.77	d3-MeFOSAA	291351.28	5.000	NMeFOSAA	N/A	0.054	
NEtFOSAA_1	584.2 / 419.1	N/A	N/A	N/A	N/A	8.95	d5-EtFOSAA	283105.93	5.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	N/A	N/A	N/A	N/A	8.95	d5-EtFOSAA	283105.93	5.000	NEtFOSAA	N/A	1.117	✓
HFPO-DA_1	284.9 / 168.9	N/A	N/A	N/A	N/A	6.78	13C3-HFPO-DA	361155.62	5.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	N/A	N/A	N/A	N/A	6.78	13C3-HFPO-DA	361155.62	5.000	HFPO-DA	N/A	0.154	✓
ADONA_1	376.9 / 250.9	N/A	N/A	N/A	N/A	7.79	13C8-PFOA	2258918.85	5.000	ADONA			
ADONA_2	376.9 / 84.8	N/A	N/A	N/A	N/A	7.79	13C8-PFOA	2258918.85	5.000	ADONA	N/A	0.002	✓
9Cl-PF3ONS_1	530.8 / 351.0	N/A	N/A	N/A	N/A	7.79	13C8-PFOA	2258918.85	5.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	N/A	N/A	N/A	N/A	7.79	13C8-PFOA	2258918.85	5.000	9Cl-PF3ONS	N/A	0.337	✓
11Cl-PF3OUdS_1	630.9 / 450.9	N/A	N/A	N/A	N/A	7.79	13C8-PFOA	2258918.85	5.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	N/A	N/A	N/A	N/A	7.79	13C8-PFOA	2258918.85	5.000	11Cl-PF3OUdS	N/A	0.323	✓

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PFAS Sample Quant Report

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Sample Name	DO705PB-FS(0)	**Injection Vial**	17
Sample ID	Procedural Blank	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 9:26:15 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.51	2774.58	0.232	15.9	6.50	13C5-PFHxA	1839714.22	25.000	PFHxA			
PFHxA_2	313.0 / 118.9	N/A	N/A	N/A	N/A	6.50	13C5-PFHxA	1839714.22	25.000	PFHxA	N/A	0.024	
PFHpA_1	363.1 / 319.0	N/A	N/A	N/A	N/A	7.22	13C4-PFHpA	2927199.74	25.000	PFHpA			
PFHpA_2	363.1 / 169.0	N/A	N/A	N/A	N/A	7.22	13C4-PFHpA	2927199.74	25.000	PFHpA	N/A	0.013	✓
PFOA_1	413.0 / 369.0	7.80	3645.93	0.130	16.9	7.78	13C8-PFOA	1845962.84	25.000	PFOA			
PFOA_2	413.0 / 169.0	7.80	405.82	0.080	52259.7	7.78	13C8-PFOA	1845962.84	25.000	PFOA	0.111	0.038	
PFNA_1	463.0 / 419.0	N/A	N/A	N/A	N/A	8.28	13C9-PFNA	954362.98	25.000	PFNA			
PFNA_2	463.0 / 219.0	N/A	N/A	N/A	N/A	8.28	13C9-PFNA	954362.98	25.000	PFNA	N/A	0.147	✓
PFDA_1	512.9 / 469.0	N/A	N/A	N/A	N/A	8.75	13C6-PFDA	1060772.21	25.000	PFDA			
PFDA_2	512.9 / 219.0	N/A	N/A	N/A	N/A	8.75	13C6-PFDA	1060772.21	25.000	PFDA	N/A	0.027	✓
PFUnA_1	563.1 / 519.0	N/A	N/A	N/A	N/A	9.21	13C7-PFUnA	1553882.66	25.000	PFUnA			
PFUnA_2	563.1 / 269.1	N/A	N/A	N/A	N/A	9.21	13C7-PFUnA	1553882.66	25.000	PFUnA	N/A	0.044	✓
PFDoA_1	613.1 / 569.0	N/A	N/A	N/A	N/A	9.67	13C2-PFDoA	1534919.12	25.000	PFDoA			
PFDoA_2	613.1 / 319.0	N/A	N/A	N/A	N/A	9.67	13C2-PFDoA	1534919.12	25.000	PFDoA	N/A	0.180	✓
PFTrDA_1	663.0 / 619.0	N/A	N/A	N/A	N/A	10.50	13C2-PFTeDA	803911.61	25.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	N/A	N/A	N/A	N/A	10.50	13C2-PFTeDA	803911.61	25.000	PFTrDA	N/A	0.025	✓
PFTeDA_1	713.0 / 669.0	N/A	N/A	N/A	N/A	10.50	13C2-PFTeDA	803911.61	25.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	N/A	N/A	N/A	N/A	10.50	13C2-PFTeDA	803911.61	25.000	PFTeDA	N/A	0.022	✓
PFBS_1	298.7 / 79.9	N/A	N/A	N/A	N/A	6.46	13C3-PFBS	418906.00	23.300	PFBS			
PFBS_2	298.9 / 98.8	N/A	N/A	N/A	N/A	6.46	13C3-PFBS	418906.00	23.300	PFBS	N/A	1.063	✓
PFHxS_1	399.0 / 80.0	N/A	N/A	N/A	N/A	7.91	13C3-PFHxS	264532.88	23.700	PFHxS			
PFHxS_2	399.0 / 99.0	N/A	N/A	N/A	N/A	7.91	13C3-PFHxS	264532.88	23.700	PFHxS	N/A	0.368	✓
PFOS_1	498.9 / 79.9	N/A	N/A	N/A	N/A	8.93	13C8-PFOS	142271.34	23.950	PFOS			
PFOS_2	498.9 / 98.9	N/A	N/A	N/A	N/A	8.93	13C8-PFOS	142271.34	23.950	PFOS	N/A	0.268	✓
NMeFOSAA_1	570.1 / 419.0	N/A	N/A	N/A	N/A	8.76	d3-MeFOSAA	218094.86	25.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	N/A	N/A	N/A	N/A	8.76	d3-MeFOSAA	218094.86	25.000	NMeFOSAA	N/A	0.054	✓
NEtFOSAA_1	584.2 / 419.1	N/A	N/A	N/A	N/A	8.94	d5-EtFOSAA	220632.96	25.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	N/A	N/A	N/A	N/A	8.94	d5-EtFOSAA	220632.96	25.000	NEtFOSAA	N/A	1.117	✓
HFPO-DA_1	284.9 / 168.9	N/A	N/A	N/A	N/A	6.77	13C3-HFPO-DA	350519.27	25.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	N/A	N/A	N/A	N/A	6.77	13C3-HFPO-DA	350519.27	25.000	HFPO-DA	N/A	0.154	✓
ADONA_1	376.9 / 250.9	7.42	575.90	0.146	49429.6	7.78	13C8-PFOA	1845962.84	25.000	ADONA			
ADONA_2	376.9 / 84.8	N/A	N/A	N/A	N/A	7.78	13C8-PFOA	1845962.84	25.000	ADONA	N/A	0.002	
9Cl-PF3ONS_1	530.8 / 351.0	N/A	N/A	N/A	N/A	7.78	13C8-PFOA	1845962.84	25.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	N/A	N/A	N/A	N/A	7.78	13C8-PFOA	1845962.84	25.000	9Cl-PF3ONS	N/A	0.337	✓
11Cl-PF3OUdS_1	630.9 / 450.9	10.23	634.16	0.566	142.0	7.78	13C8-PFOA	1845962.84	25.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	N/A	N/A	N/A	N/A	7.78	13C8-PFOA	1845962.84	25.000	11Cl-PF3OUdS	N/A	0.323	

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PFAS Sample Quant Report

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Sample Name	DO706LCS-FS(0)	**Injection Vial**	18
Sample ID	Laboratory Control Sample	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 9:42:20 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.52	4236743.87	54.277	4148.5	6.50	13C5-PFHxA	1561236.12	25.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.52	108070.24	60.316	1928.0	6.50	13C5-PFHxA	1561236.12	25.000	PFHxA	0.026	0.024	✓
PFHpA_1	363.1 / 319.0	7.24	5954697.37	48.342	1837.6	7.22	13C4-PFHpA	2625605.36	25.000	PFHpA			
PFHpA_2	363.1 / 169.0	7.24	78766.81	48.720	1511.5	7.22	13C4-PFHpA	2625605.36	25.000	PFHpA	0.013	0.013	✓
PFOA_1	413.0 / 369.0	7.80	4223152.47	62.184	2811.0	7.78	13C8-PFOA	1664622.38	25.000	PFOA			
PFOA_2	413.0 / 169.0	7.80	151145.36	62.910	3217.5	7.78	13C8-PFOA	1664622.38	25.000	PFOA	0.036	0.038	✓
PFNA_1	463.0 / 419.0	8.29	1883188.43	47.545	2116.6	8.28	13C9-PFNA	898363.51	25.000	PFNA			
PFNA_2	463.0 / 219.0	8.29	274064.36	47.277	3029479.7	8.28	13C9-PFNA	898363.51	25.000	PFNA	0.146	0.147	✓
PFDA_1	512.9 / 469.0	8.76	1056945.61	50.444	1438.0	8.74	13C6-PFDA	960883.78	25.000	PFDA			
PFDA_2	512.9 / 219.0	8.76	26386.49	46.390	798.8	8.74	13C6-PFDA	960883.78	25.000	PFDA	0.025	0.027	✓
PFUnA_1	563.1 / 519.0	9.22	3029525.80	59.426	2191.5	9.21	13C7-PFUnA	1371664.43	25.000	PFUnA			
PFUnA_2	563.1 / 269.1	9.22	122741.79	53.524	153471.7	9.21	13C7-PFUnA	1371664.43	25.000	PFUnA	0.041	0.044	✓
PFDoA_1	613.1 / 569.0	9.68	1780268.89	59.843	1792.8	9.67	13C2-PFDoA	1473209.01	25.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.68	324261.80	62.281	1076627.1	9.67	13C2-PFDoA	1473209.01	25.000	PFDoA	0.182	0.180	✓
PFTrDA_1	663.0 / 619.0	10.11	2222266.30	64.534	1686.3	10.50	13C2-PFTeDA	802544.45	25.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	10.11	54058.87	59.279	1427.3	10.50	13C2-PFTeDA	802544.45	25.000	PFTrDA	0.024	0.025	✓
PFTeDA_1	713.0 / 669.0	10.51	1295525.57	49.245	1870.5	10.50	13C2-PFTeDA	802544.45	25.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	10.51	22937.47	42.982	1766.0	10.50	13C2-PFTeDA	802544.45	25.000	PFTeDA	0.018	0.022	✓
PFBS_1	298.7 / 79.9	6.47	180856.98	62.770	26558.4	6.45	13C3-PFBS	349881.41	23.300	PFBS			
PFBS_2	298.9 / 98.8	6.47	172954.05	55.650	2210.8	6.45	13C3-PFBS	349881.41	23.300	PFBS	0.956	1.063	✓
PFHxS_1	399.0 / 80.0	7.93	573403.67	56.344	5361.7	7.91	13C3-PFHxS	238451.79	23.700	PFHxS			
PFHxS_2	399.0 / 99.0	7.92	238492.07	63.648	2204.5	7.91	13C3-PFHxS	238451.79	23.700	PFHxS	0.416	0.368	✓
PFOS_1	498.9 / 79.9	8.94	201917.22	58.835	527.3	8.93	13C8-PFOS	129292.93	23.950	PFOS			
PFOS_2	498.9 / 98.9	8.94	54611.36	63.668	696.4	8.93	13C8-PFOS	129292.93	23.950	PFOS	0.271	0.268	✓
NMeFOSAA_1	570.1 / 419.0	8.77	389622.73	56.548	38290.4	8.76	d3-MeFOSAA	211850.61	25.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	8.77	20288.90	52.957	152.3	8.76	d3-MeFOSAA	211850.61	25.000	NMeFOSAA	0.052	0.054	✓
NEtFOSAA_1	584.2 / 419.1	8.95	339751.17	48.651	447150.8	8.94	d5-EtFOSAA	201848.68	25.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	8.95	414664.28	52.319	4694.9	8.94	d5-EtFOSAA	201848.68	25.000	NEtFOSAA	1.221	1.117	✓
HFPO-DA_1	284.9 / 168.9	6.78	747763.89	46.329	6432.3	6.77	13C3-HFPO-DA	344276.04	25.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	6.78	113956.89	48.175	1171.1	6.77	13C3-HFPO-DA	344276.04	25.000	HFPO-DA	0.152	0.154	✓
ADONA_1	376.9 / 250.9	7.44	8973901.08	68.825	1905.3	7.78	13C8-PFOA	1664622.38	25.000	ADONA			
ADONA_2	376.9 / 84.8	7.44	22106.29	69.148	868.5	7.78	13C8-PFOA	1664622.38	25.000	ADONA	0.003	0.002	✓
9Cl-PF3ONS_1	530.8 / 351.0	9.26	2748161.55	64.427	6453.2	7.78	13C8-PFOA	1664622.38	25.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	9.27	901705.99	65.985	9487.7	7.78	13C8-PFOA	1664622.38	25.000	9Cl-PF3ONS	0.328	0.337	✓
11Cl-PF3OUdS_1	630.9 / 450.9	10.17	5995752.35	56.948	7461.9	7.78	13C8-PFOA	1664622.38	25.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	10.17	1674391.12	51.982	5131.0	7.78	13C8-PFOA	1664622.38	25.000	11Cl-PF3OUdS	0.279	0.323	✓

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PFAS Sample Quant Report

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Sample Name	D7904-FS(0)	**Injection Vial**	19
Sample ID	NBKK-B76-IDW01-SO-081523	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 9:58:24 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.52	15583.83	0.430	78.4	6.50	13C5-PFHxA	1360567.85	25.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.51	478.31	0.364	19.5	6.50	13C5-PFHxA	1360567.85	25.000	PFHxA	0.031	0.024	✓
PFHpA_1	363.1 / 319.0	7.24	23969.34	0.354	41.8	7.22	13C4-PFHpA	2263240.15	25.000	PFHpA			
PFHpA_2	363.1 / 169.0	7.23	782.93	0.664	2231.7	7.22	13C4-PFHpA	2263240.15	25.000	PFHpA	0.033	0.013	
PFOA_1	413.0 / 369.0	7.81	49119.61	0.797	129.7	7.79	13C8-PFOA	1681186.79	25.000	PFOA			
PFOA_2	413.0 / 169.0	7.79	875.36	0.289	581.1	7.79	13C8-PFOA	1681186.79	25.000	PFOA	0.018	0.038	
PFNA_1	463.0 / 419.0	8.29	6445.59	0.294	34.2	8.28	13C9-PFNA	797370.58	25.000	PFNA			
PFNA_2	463.0 / 219.0	8.30	1908.78	0.487	2501568.0	8.28	13C9-PFNA	797370.58	25.000	PFNA	0.296	0.147	
PFDA_1	512.9 / 469.0	8.77	3919.06	0.385	37.8	8.75	13C6-PFDA	883261.59	25.000	PFDA			
PFDA_2	512.9 / 219.0	N/A	N/A	N/A	N/A	8.75	13C6-PFDA	883261.59	25.000	PFDA	N/A	0.027	
PFUnA_1	563.1 / 519.0	9.20	3661.05	0.214	31.3	9.21	13C7-PFUnA	1233664.21	25.000	PFUnA			
PFUnA_2	563.1 / 269.1	9.20	730.28	0.547	67.0	9.21	13C7-PFUnA	1233664.21	25.000	PFUnA	0.200	0.044	
PFDoA_1	613.1 / 569.0	9.69	4175.36	0.140	13.5	9.67	13C2-PFDoA	1223786.07	25.000	PFDoA			
PFDoA_2	613.1 / 319.0	9.68	414.12	< 0	61.8	9.67	13C2-PFDoA	1223786.07	25.000	PFDoA	0.099	0.180	✓
PFTrDA_1	663.0 / 619.0	N/A	N/A	N/A	N/A	10.50	13C2-PFTeDA	596627.24	25.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	N/A	N/A	N/A	N/A	10.50	13C2-PFTeDA	596627.24	25.000	PFTrDA	N/A	0.025	✓
PFTeDA_1	713.0 / 669.0	10.51	1363.89	0.021	18.6	10.50	13C2-PFTeDA	596627.24	25.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	N/A	N/A	N/A	N/A	10.50	13C2-PFTeDA	596627.24	25.000	PFTeDA	N/A	0.022	
PFBS_1	298.7 / 79.9	N/A	N/A	N/A	N/A	6.46	13C3-PFBS	332121.04	23.300	PFBS			
PFBS_2	298.9 / 98.8	N/A	N/A	N/A	N/A	6.46	13C3-PFBS	332121.04	23.300	PFBS	N/A	1.063	✓
PFHxS_1	399.0 / 80.0	7.92	2797.49	0.286	2761.8	7.91	13C3-PFHxS	216015.00	23.700	PFHxS			
PFHxS_2	399.0 / 99.0	7.93	1380.72	0.394	310.7	7.91	13C3-PFHxS	216015.00	23.700	PFHxS	0.494	0.368	✓
PFOS_1	498.9 / 79.9	8.94	16813.20	5.540	8172.6	8.93	13C8-PFOS	110521.89	23.950	PFOS			
PFOS_2	498.9 / 98.9	8.94	3722.14	4.683	586.9	8.93	13C8-PFOS	110521.89	23.950	PFOS	0.221	0.268	✓
NMeFOSAA_1	570.1 / 419.0	N/A	N/A	N/A	N/A	8.76	d3-MeFOSAA	213876.85	25.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	N/A	N/A	N/A	N/A	8.76	d3-MeFOSAA	213876.85	25.000	NMeFOSAA	N/A	0.054	✓
NEtFOSAA_1	584.2 / 419.1	N/A	N/A	N/A	N/A	8.94	d5-EtFOSAA	197040.01	25.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	N/A	N/A	N/A	N/A	8.94	d5-EtFOSAA	197040.01	25.000	NEtFOSAA	N/A	1.117	✓
HFPO-DA_1	284.9 / 168.9	N/A	N/A	N/A	N/A	6.77	13C3-HFPO-DA	290046.56	25.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	N/A	N/A	N/A	N/A	6.77	13C3-HFPO-DA	290046.56	25.000	HFPO-DA	N/A	0.154	✓
ADONA_1	376.9 / 250.9	N/A	N/A	N/A	N/A	7.79	13C8-PFOA	1681186.79	25.000	ADONA			
ADONA_2	376.9 / 84.8	N/A	N/A	N/A	N/A	7.79	13C8-PFOA	1681186.79	25.000	ADONA	N/A	0.002	✓
9Cl-PF3ONS_1	530.8 / 351.0	N/A	N/A	N/A	N/A	7.79	13C8-PFOA	1681186.79	25.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	N/A	N/A	N/A	N/A	7.79	13C8-PFOA	1681186.79	25.000	9Cl-PF3ONS	N/A	0.337	✓
11Cl-PF3OUdS_1	630.9 / 450.9	N/A	N/A	N/A	N/A	7.79	13C8-PFOA	1681186.79	25.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	N/A	N/A	N/A	N/A	7.79	13C8-PFOA	1681186.79	25.000	11Cl-PF3OUdS	N/A	0.323	✓

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PFAS Sample Quant Report

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Printed: 24/08/2023 8:45:17 AM

Sample Name	D7905-FS(0)	**Injection Vial**	20
Sample ID	NBKK-B76-IDW02-SO-081623	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 10:14:27 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFHxA_1	313.0 / 269.0	6.52	14433.99	0.394	42.6	6.50	13C5-PFHxA	1496440.63	25.000	PFHxA			
PFHxA_2	313.0 / 118.9	6.49	450.49	0.321	16.3	6.50	13C5-PFHxA	1496440.63	25.000	PFHxA	0.031	0.024	✓
PFHpA_1	363.1 / 319.0	7.23	15052.40	0.262	35.0	7.22	13C4-PFHpA	2410387.71	25.000	PFHpA			
PFHpA_2	363.1 / 169.0	7.21	378.66	0.358	548.9	7.22	13C4-PFHpA	2410387.71	25.000	PFHpA	0.025	0.013	
PFOA_1	413.0 / 369.0	7.80	21786.42	0.381	68.1	7.78	13C8-PFOA	1779473.90	25.000	PFOA			
PFOA_2	413.0 / 169.0	7.81	912.42	0.283	466.5	7.78	13C8-PFOA	1779473.90	25.000	PFOA	0.042	0.038	✓
PFNA_1	463.0 / 419.0	8.30	2551.53	0.180	23.4	8.27	13C9-PFNA	836862.37	25.000	PFNA			
PFNA_2	463.0 / 219.0	8.35	357.20	0.183	25.8	8.27	13C9-PFNA	836862.37	25.000	PFNA	0.140	0.147	✓
PFDA_1	512.9 / 469.0	N/A	N/A	N/A	N/A	8.74	13C6-PFDA	905336.76	25.000	PFDA			
PFDA_2	512.9 / 219.0	N/A	N/A	N/A	N/A	8.74	13C6-PFDA	905336.76	25.000	PFDA	N/A	0.027	✓
PFUnA_1	563.1 / 519.0	N/A	N/A	N/A	N/A	9.20	13C7-PFUnA	1221232.04	25.000	PFUnA			
PFUnA_2	563.1 / 269.1	N/A	N/A	N/A	N/A	9.20	13C7-PFUnA	1221232.04	25.000	PFUnA	N/A	0.044	✓
PFDoA_1	613.1 / 569.0	N/A	N/A	N/A	N/A	9.66	13C2-PFDoA	1372047.07	25.000	PFDoA			
PFDoA_2	613.1 / 319.0	N/A	N/A	N/A	N/A	9.66	13C2-PFDoA	1372047.07	25.000	PFDoA	N/A	0.180	✓
PFTrDA_1	663.0 / 619.0	N/A	N/A	N/A	N/A	10.49	13C2-PFTeDA	645602.69	25.000	PFTrDA			
PFTrDA_2	663.0 / 168.9	N/A	N/A	N/A	N/A	10.49	13C2-PFTeDA	645602.69	25.000	PFTrDA	N/A	0.025	✓
PFTeDA_1	713.0 / 669.0	N/A	N/A	N/A	N/A	10.49	13C2-PFTeDA	645602.69	25.000	PFTeDA			
PFTeDA_2	713.0 / 168.9	N/A	N/A	N/A	N/A	10.49	13C2-PFTeDA	645602.69	25.000	PFTeDA	N/A	0.022	✓
PFBS_1	298.7 / 79.9	N/A	N/A	N/A	N/A	6.45	13C3-PFBS	383777.10	23.300	PFBS			
PFBS_2	298.9 / 98.8	N/A	N/A	N/A	N/A	6.45	13C3-PFBS	383777.10	23.300	PFBS	N/A	1.063	✓
PFHxS_1	399.0 / 80.0	7.92	1708.92	0.140	950.2	7.91	13C3-PFHxS	253714.78	23.700	PFHxS			
PFHxS_2	399.0 / 99.0	N/A	N/A	N/A	N/A	7.91	13C3-PFHxS	253714.78	23.700	PFHxS	N/A	0.368	
PFOS_1	498.9 / 79.9	8.94	12262.33	3.243	152.4	8.92	13C8-PFOS	134197.74	23.950	PFOS			
PFOS_2	498.9 / 98.9	8.94	3002.47	2.968	23488.8	8.92	13C8-PFOS	134197.74	23.950	PFOS	0.245	0.268	✓
NMeFOSAA_1	570.1 / 419.0	N/A	N/A	N/A	N/A	8.75	d3-MeFOSAA	188772.49	25.000	NMeFOSAA			
NMeFOSAA_2	570.1 / 483.0	N/A	N/A	N/A	N/A	8.75	d3-MeFOSAA	188772.49	25.000	NMeFOSAA	N/A	0.054	✓
NEtFOSAA_1	584.2 / 419.1	N/A	N/A	N/A	N/A	8.93	d5-EtFOSAA	169960.23	25.000	NEtFOSAA			
NEtFOSAA_2	584.2 / 526.0	N/A	N/A	N/A	N/A	8.93	d5-EtFOSAA	169960.23	25.000	NEtFOSAA	N/A	1.117	✓
HFPO-DA_1	284.9 / 168.9	N/A	N/A	N/A	N/A	6.77	13C3-HFPO-DA	299216.10	25.000	HFPO-DA			
HFPO-DA_2	284.9 / 184.9	N/A	N/A	N/A	N/A	6.77	13C3-HFPO-DA	299216.10	25.000	HFPO-DA	N/A	0.154	✓
ADONA_1	376.9 / 250.9	7.76	444.57	0.145	50.9	7.78	13C8-PFOA	1779473.90	25.000	ADONA			
ADONA_2	376.9 / 84.8	N/A	N/A	N/A	N/A	7.78	13C8-PFOA	1779473.90	25.000	ADONA	N/A	0.002	
9Cl-PF3ONS_1	530.8 / 351.0	N/A	N/A	N/A	N/A	7.78	13C8-PFOA	1779473.90	25.000	9Cl-PF3ONS			
9Cl-PF3ONS_2	532.8 / 353.0	N/A	N/A	N/A	N/A	7.78	13C8-PFOA	1779473.90	25.000	9Cl-PF3ONS	N/A	0.337	✓
11Cl-PF3OUdS_1	630.9 / 450.9	N/A	N/A	N/A	N/A	7.78	13C8-PFOA	1779473.90	25.000	11Cl-PF3OUdS			
11Cl-PF3OUdS_2	632.9 / 452.9	N/A	N/A	N/A	N/A	7.78	13C8-PFOA	1779473.90	25.000	11Cl-PF3OUdS	N/A	0.323	✓

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PFAS Sample Quant Report

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Printed: 23/08/2023 9:35:41 AM

Sample Name	LZ91 IB	**Injection Vial**	11
Sample ID	Instrument Blank	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:49:57 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.51	1802833.42	5.092	5913.8	7.79	13C2-PFOA	1715413.09	5.000				
13C4-PFHpA	367.1 / 322.0	7.23	3107994.38	5.362	12509.2	7.79	13C2-PFOA	1715413.09	5.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.79	2258918.85	4.965	7309.7	7.79	13C2-PFOA	1715413.09	5.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	8.29	1062564.64	4.958	13536.4	7.79	13C2-PFOA	1715413.09	5.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.76	1050625.72	4.671	40870.2	8.75	13C2-PFDA	849482.95	5.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	9.22	1721003.50	4.924	6576.4	8.75	13C2-PFDA	849482.95	5.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.68	1922637.05	4.679	6038.5	8.75	13C2-PFDA	849482.95	5.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.51	1138143.74	4.665	4389.9	8.75	13C2-PFDA	849482.95	5.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.46	428952.71	5.541	2325.4	8.94	13C4-PFOS	63529.99	4.790		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.92	297693.09	5.305	18948.0	8.94	13C4-PFOS	63529.99	4.790		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.94	158597.64	5.190	3911.1	8.94	13C4-PFOS	63529.99	4.790		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.77	291351.28	5.868	2590.0	8.94	13C4-PFOS	63529.99	4.790		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.95	283105.93	5.687	1826905.1	8.94	13C4-PFOS	63529.99	4.790		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.78	361155.62	4.750	1729.4	7.79	13C2-PFOA	1715413.09	5.000		N/A	N/A	✓

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PFAS Sample Quant Report

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Printed: 23/08/2023 9:35:41 AM

Sample Name	DO705PB-FS(0)	**Injection Vial**	17
Sample ID	Procedural Blank	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 9:26:15 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.50	1839714.22	27.674	6319.8	7.78	13C2-PFOA	1610541.66	25.000				
13C4-PFHpA	367.1 / 322.0	7.22	2927199.74	26.894	10563.3	7.78	13C2-PFOA	1610541.66	25.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.78	1845962.84	21.607	23830.6	7.78	13C2-PFOA	1610541.66	25.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	8.28	954362.98	23.718	24049.8	7.78	13C2-PFOA	1610541.66	25.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.75	1060772.21	22.764	9961.5	8.74	13C2-PFDA	880020.16	25.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	9.21	1553882.66	21.457	5074.3	8.74	13C2-PFDA	880020.16	25.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.67	1534919.12	18.027	7763.2	8.74	13C2-PFDA	880020.16	25.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.50	803911.61	15.904	897128.0	8.74	13C2-PFDA	880020.16	25.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.46	418906.00	24.063	2445.9	8.93	13C4-PFOS	71426.50	23.950		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.91	264532.88	20.964	3773.4	8.93	13C4-PFOS	71426.50	23.950		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.93	142271.34	20.705	724.7	8.93	13C4-PFOS	71426.50	23.950		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.76	218094.86	19.534	1809.8	8.93	13C4-PFOS	71426.50	23.950		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.94	220632.96	19.709	790.2	8.93	13C4-PFOS	71426.50	23.950		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.77	350519.27	24.553	23100.0	7.78	13C2-PFOA	1610541.66	25.000		N/A	N/A	✓

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PFAS Sample Quant Report

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Printed: 23/08/2023 9:35:41 AM

Sample Name	DO706LCS-FS(0)	**Injection Vial**	18
Sample ID	Laboratory Control Sample	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 9:42:20 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.50	1561236.12	25.076	8791.7	7.78	13C2-PFOA	1508350.32	25.000				
13C4-PFHpA	367.1 / 322.0	7.22	2625605.36	25.758	7810.9	7.78	13C2-PFOA	1508350.32	25.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.78	1664622.38	20.804	9018.9	7.78	13C2-PFOA	1508350.32	25.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	8.28	898363.51	23.838	13925.4	7.78	13C2-PFOA	1508350.32	25.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.74	960883.78	21.915	7687.4	8.74	13C2-PFDA	828030.38	25.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	9.21	1371664.43	20.130	3585.0	8.74	13C2-PFDA	828030.38	25.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.67	1473209.01	18.389	3247.7	8.74	13C2-PFDA	828030.38	25.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.50	802544.45	16.874	4102.6	8.74	13C2-PFDA	828030.38	25.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.45	349881.41	20.013	3603.2	8.92	13C4-PFOS	71729.10	23.950		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.91	238451.79	18.817	3764.1	8.92	13C4-PFOS	71729.10	23.950		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.93	129292.93	18.737	16684.5	8.92	13C4-PFOS	71729.10	23.950		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.76	211850.61	18.894	1417.7	8.92	13C4-PFOS	71729.10	23.950		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.94	201848.68	17.955	109860.1	8.92	13C4-PFOS	71729.10	23.950		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.77	344276.04	25.750	50978.0	7.78	13C2-PFOA	1508350.32	25.000		N/A	N/A	✓

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PFAS Sample Quant Report

Created with Analyst Reporter
Printed: 23/08/2023 9:35:41 AM

Sample Name	D7904-FS(0)	**Injection Vial**	19
Sample ID	NBKK-B76-IDW01-SO-0815823	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 9:58:24 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.50	1360567.85	20.846	3367.5	7.78	13C2-PFOA	1581190.37	25.000				
13C4-PFHpA	367.1 / 322.0	7.22	2263240.15	21.180	4809.6	7.78	13C2-PFOA	1581190.37	25.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.79	1681186.79	20.043	6921.6	7.78	13C2-PFOA	1581190.37	25.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	8.28	797370.58	20.184	12163.4	7.78	13C2-PFOA	1581190.37	25.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.75	883261.59	20.639	4004.8	8.74	13C2-PFDA	808194.10	25.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	9.21	1233664.21	18.549	4111.8	8.74	13C2-PFDA	808194.10	25.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.67	1223786.07	15.650	7220.2	8.74	13C2-PFDA	808194.10	25.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.50	596627.24	12.852	6227.4	8.74	13C2-PFDA	808194.10	25.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.46	332121.04	19.551	2127.1	8.93	13C4-PFOS	69699.37	23.950		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.91	216015.00	17.543	1806.8	8.93	13C4-PFOS	69699.37	23.950		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.93	110521.89	16.483	2547.7	8.93	13C4-PFOS	69699.37	23.950		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.76	213876.85	19.631	1357.6	8.93	13C4-PFOS	69699.37	23.950		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.94	197040.01	18.038	2124.6	8.93	13C4-PFOS	69699.37	23.950		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.77	290046.56	20.694	907769.8	7.78	13C2-PFOA	1581190.37	25.000		N/A	N/A	✓

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PFAS Sample Quant Report

Created with Analyst Reporter
Printed: 23/08/2023 9:35:41 AM

Sample Name	D7905-FS(0)	**Injection Vial**	20
Sample ID	NBKK-B76-IDW02-SO-0816823	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 10:14:27 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS
Sample Comment			

Results Summary

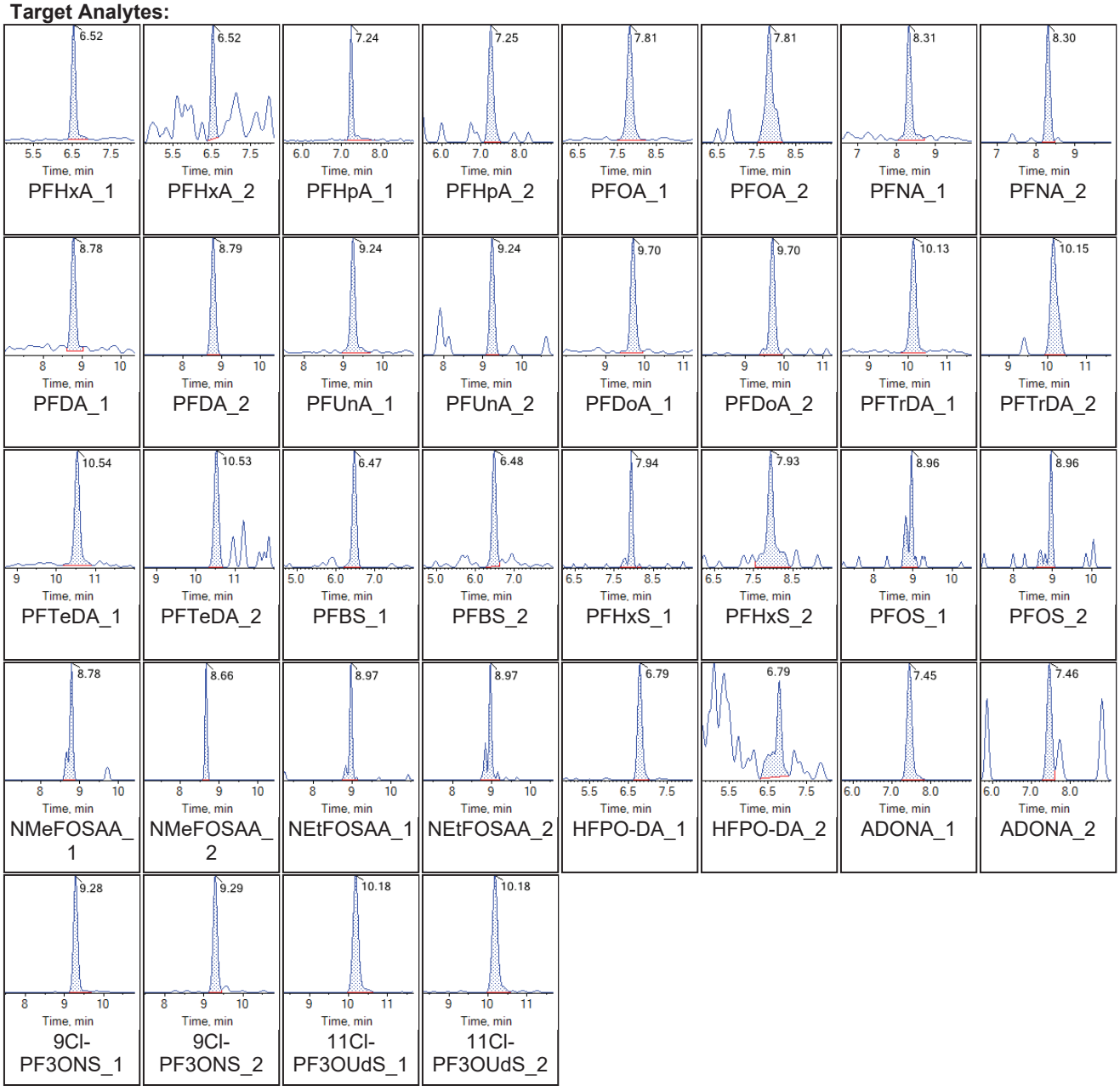
Analyte	MRM Transition	RT	Area	Conc. (ng)	S/N Ratio	IS RT	IS	IS Area	IS Conc. (ng)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C5-PFHxA	318.0 / 273.0	6.50	1496440.63	19.628	6688.4	7.77	13C2-PFOA	1847054.88	25.000				
13C4-PFHpA	367.1 / 322.0	7.22	2410387.71	19.310	7456.3	7.77	13C2-PFOA	1847054.88	25.000		N/A	N/A	✓
13C8-PFOA	421.1 / 376.0	7.78	1779473.90	18.161	24304.9	7.77	13C2-PFOA	1847054.88	25.000		N/A	N/A	✓
13C9-PFNA	472.1 / 427.0	8.27	836862.37	18.134	5817.4	7.77	13C2-PFOA	1847054.88	25.000		N/A	N/A	✓
13C6-PFDA	519.1 / 474.1	8.74	905336.76	19.254	7702.8	8.74	13C2-PFDA	887985.79	25.000		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.1	9.20	1221232.04	16.712	3465.6	8.74	13C2-PFDA	887985.79	25.000		N/A	N/A	✓
13C2-PFDoA	615.1 / 570.0	9.66	1372047.07	15.970	6644.1	8.74	13C2-PFDA	887985.79	25.000		N/A	N/A	✓
13C2-PFTeDA	715.2 / 670.0	10.49	645602.69	12.657	2344.3	8.74	13C2-PFDA	887985.79	25.000		N/A	N/A	✓
13C3-PFBS	302.1 / 79.9	6.45	383777.10	20.037	3141.4	8.92	13C4-PFOS	78583.23	23.950		N/A	N/A	✓
13C3-PFHxS	402.1 / 79.9	7.91	253714.78	18.275	1831.2	8.92	13C4-PFOS	78583.23	23.950		N/A	N/A	✓
13C8-PFOS	507.1 / 79.9	8.92	134197.74	17.751	3697.7	8.92	13C4-PFOS	78583.23	23.950		N/A	N/A	✓
d3-MeFOSAA	573.2 / 419.0	8.75	188772.49	15.368	2036.7	8.92	13C4-PFOS	78583.23	23.950		N/A	N/A	✓
d5-EtFOSAA	589.2 / 419.0	8.93	169960.23	13.800	1430.7	8.92	13C4-PFOS	78583.23	23.950		N/A	N/A	✓
13C3-HFPO-DA	286.9 / 168.9	6.77	299216.10	18.276	8253.0	7.77	13C2-PFOA	1847054.88	25.000		N/A	N/A	✓

Chromatograms

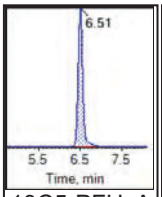
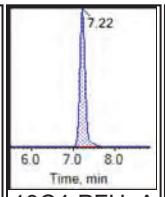
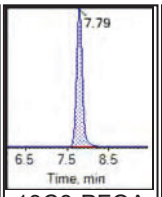
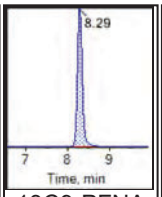
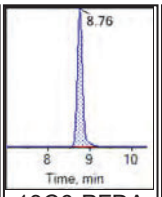
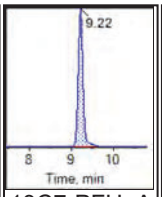
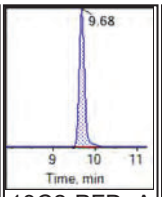
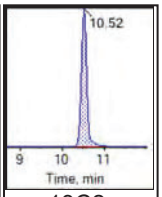
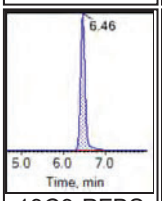
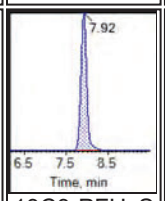
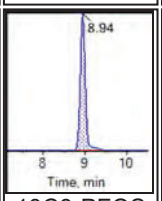
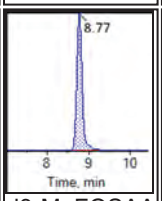
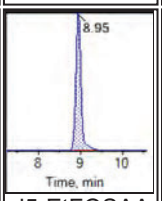
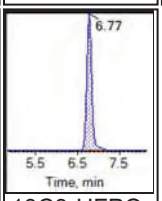
Sample Name	LZ83	**Injection Vial**	3
Sample ID	L1	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036

Chromatograms

Target Analytes:



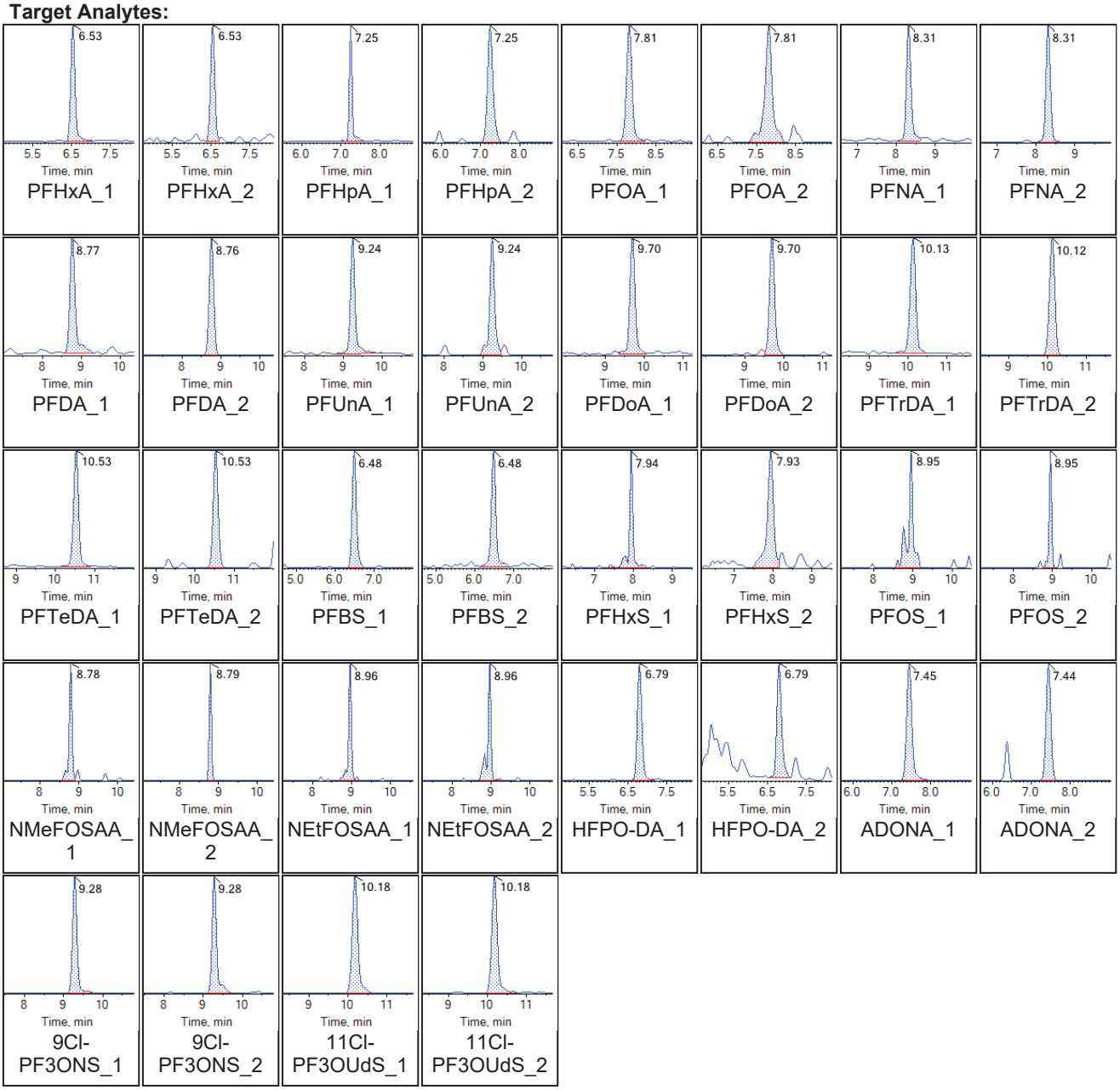
Internal Standards:

 13C5-PFHxA	 13C4-PFHpA	 13C8-PFOA	 13C9-PFNA	 13C6-PFDA	 13C7-PFUnA	 13C2-PFDoA	 13C2-PFTeDA
 13C3-PFBS	 13C3-PFHxS	 13C8-PFOS	 d3-MeFOSAA	 d5-EtFOSAA	 13C3-HFPO-DA		

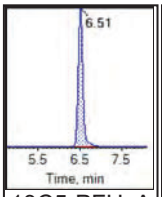
Sample Name	LZ84	**Injection Vial**	4
Sample ID	L2	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:57:41 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036

Chromatograms

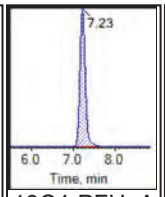
Target Analytes:



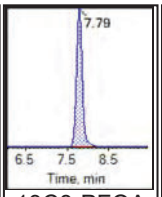
Internal Standards:



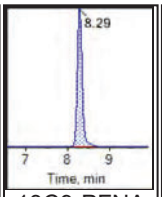
13C5-PFHxA



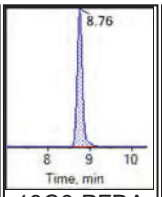
13C4-PFHpA



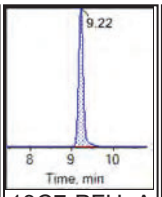
13C8-PFOA



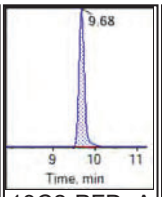
13C9-PFNA



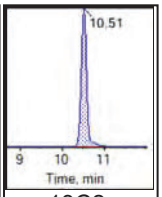
13C6-PFDA



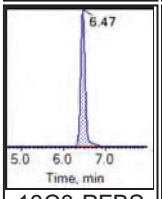
13C7-PFUnA



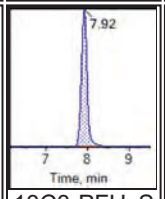
13C2-PFDoA



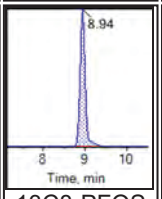
13C2-PFTeDA



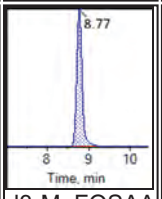
13C3-PFBS



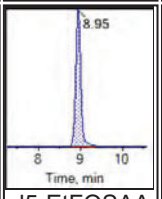
13C3-PFHxS



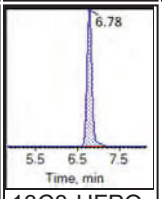
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA

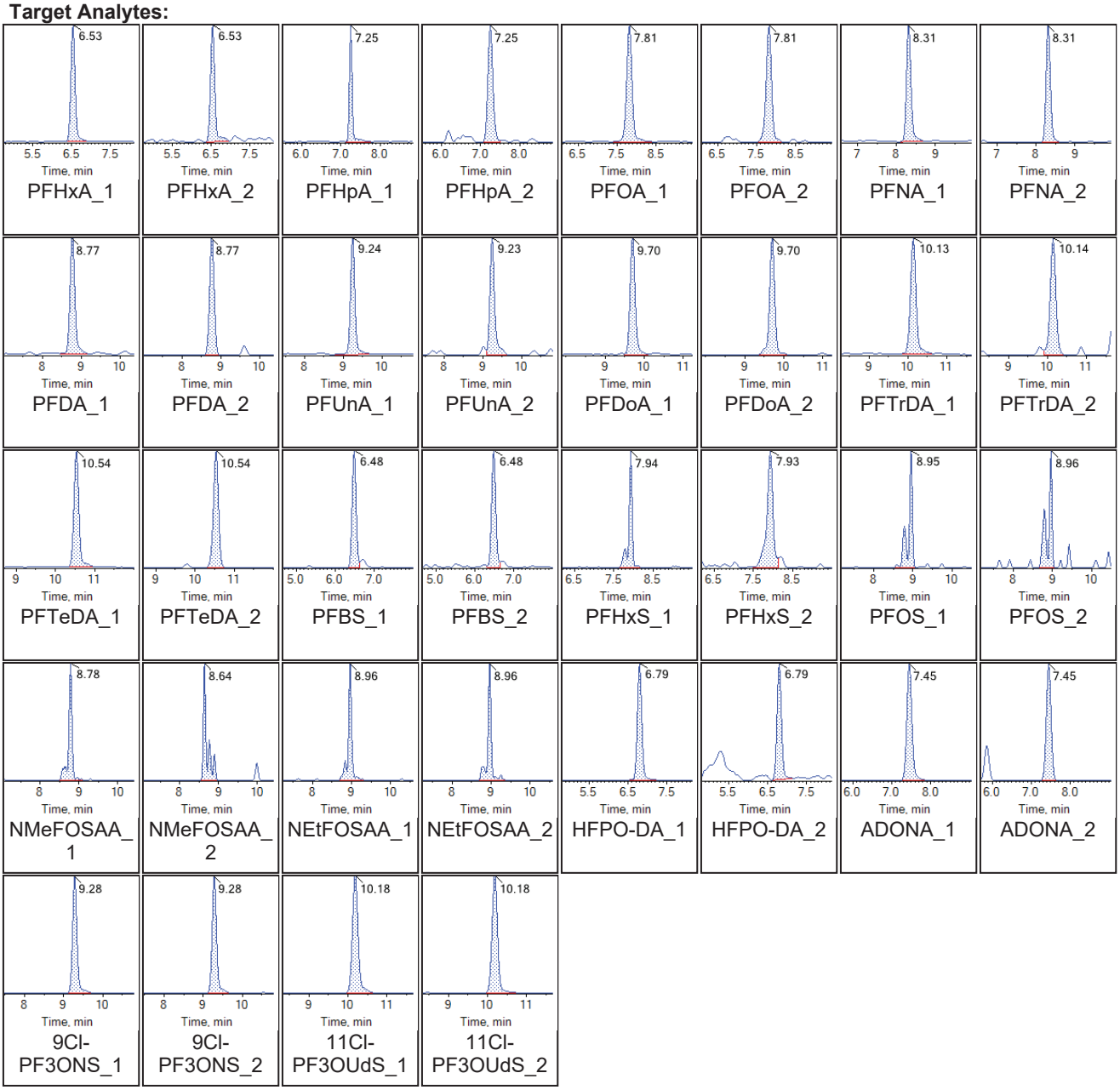


13C3-HFPO-DA

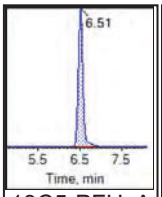
Sample Name	LZ85	**Injection Vial**	5
Sample ID	L3	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 6:13:44 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036

Chromatograms

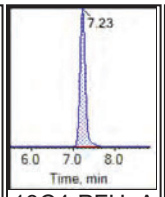
Target Analytes:



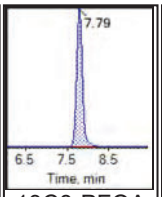
Internal Standards:



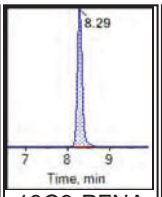
13C5-PFHxA



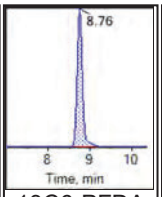
13C4-PFHpA



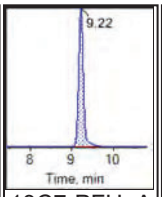
13C8-PFOA



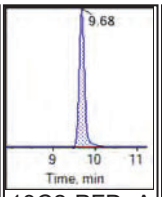
13C9-PFNA



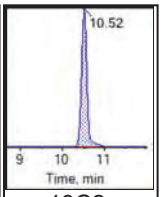
13C6-PFDA



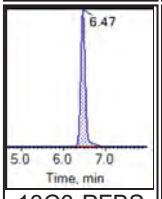
13C7-PFUnA



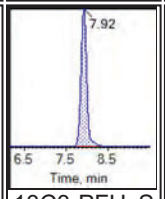
13C2-PFDoA



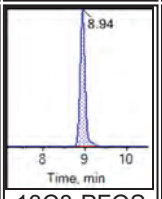
13C2-PFTeDA



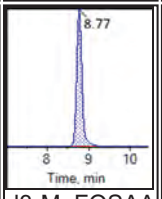
13C3-PFBS



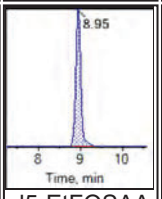
13C3-PFHxS



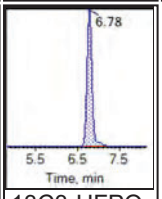
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA

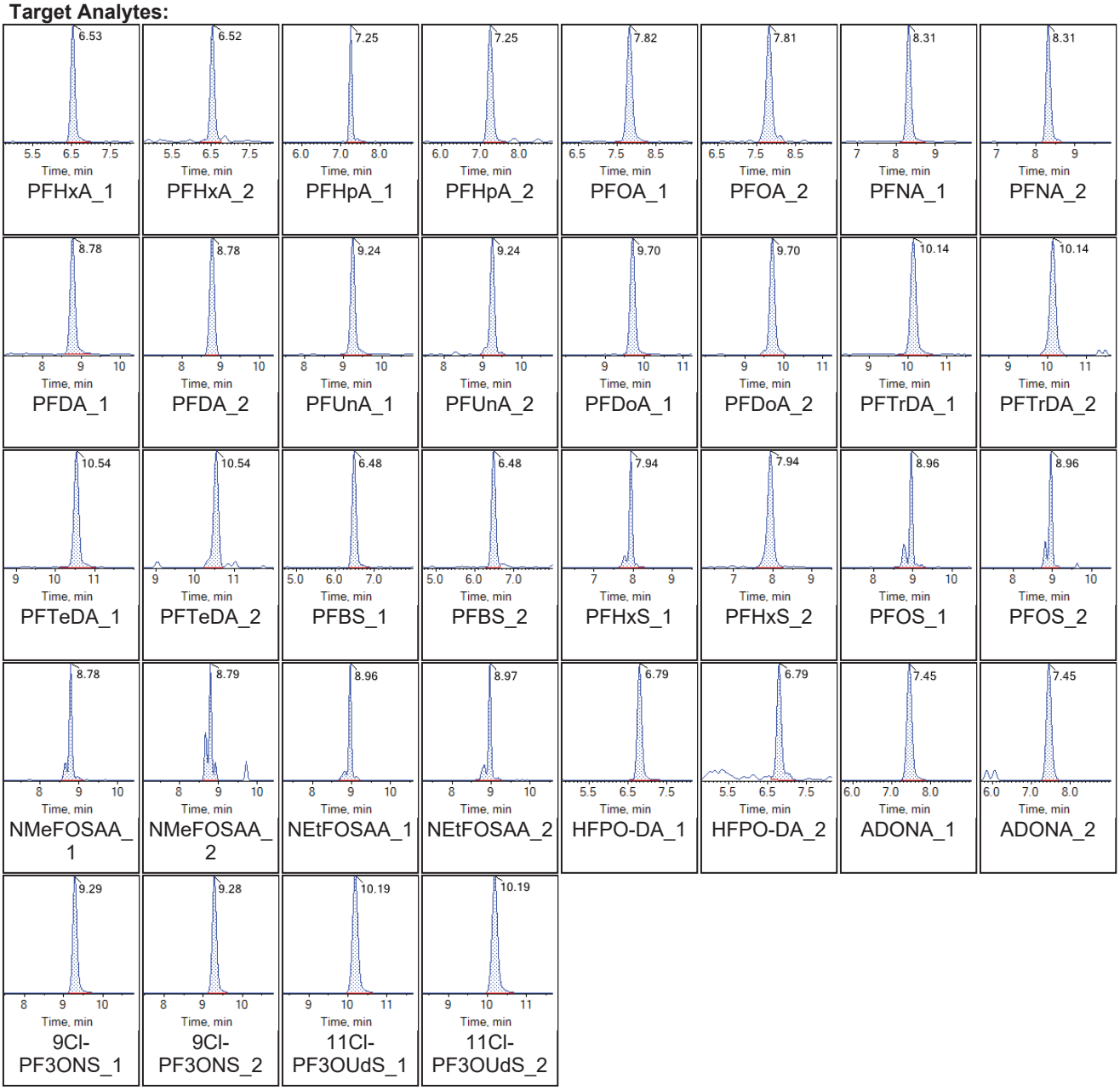


13C3-HFPO-DA

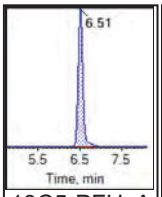
Sample Name	LZ86	**Injection Vial**	6
Sample ID	L4	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 6:29:47 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036

Chromatograms

Target Analytes:



Internal Standards:



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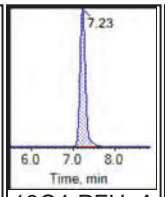
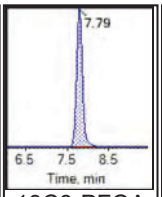
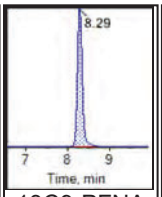


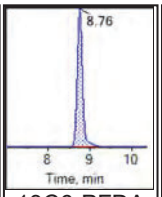
13C4-PFHpA



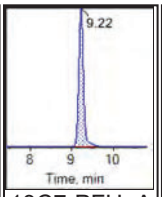
13C8-PFOA



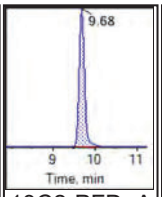
13C9-PFNA



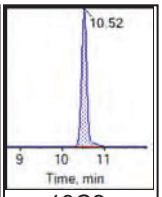
13C6-PFDA



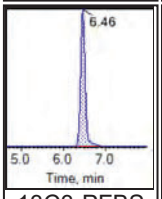
13C7-PFUnA



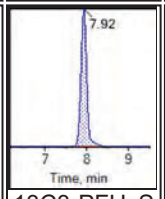
13C2-PFDoA



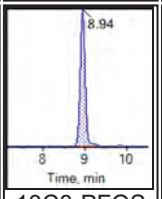
13C2-PFTeDA



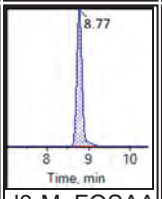
13C3-PFBS



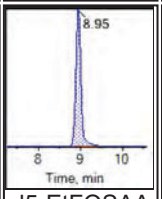
13C3-PFHxS



13C8-PFOS



d3-MeFOSAA



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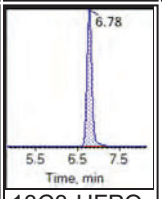


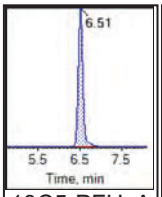
13C3-HFPO-DA

Sample Name	LZ87	**Injection Vial**	7
Sample ID	L5	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 6:45:50 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036

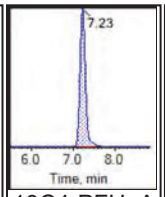
Chromatograms

Target Analytes:

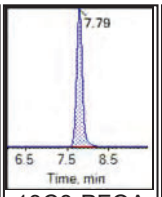
Internal Standards:



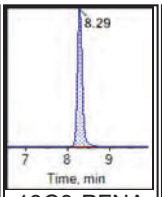
13C5-PFHxA



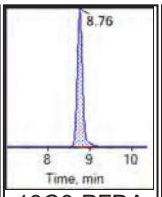
13C4-PFHpA



13C8-PFOA



13C9-PFNA



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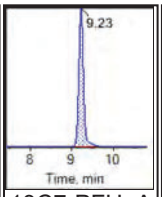
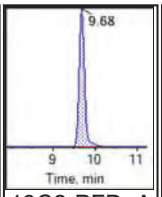
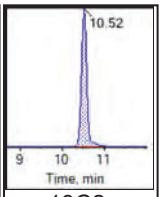


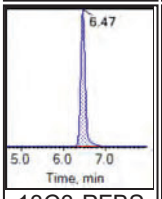
13C7-PFUnA



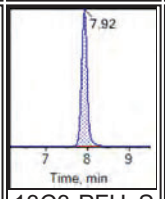
13C2-PFDoA



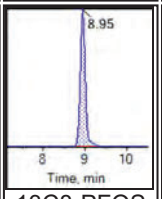
13C2-PFTeDA



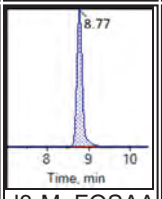
13C3-PFBS



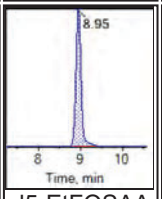
13C3-PFHxS



13C8-PFOS



d3-MeFOSAA



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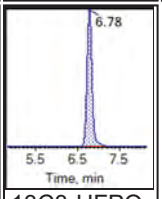
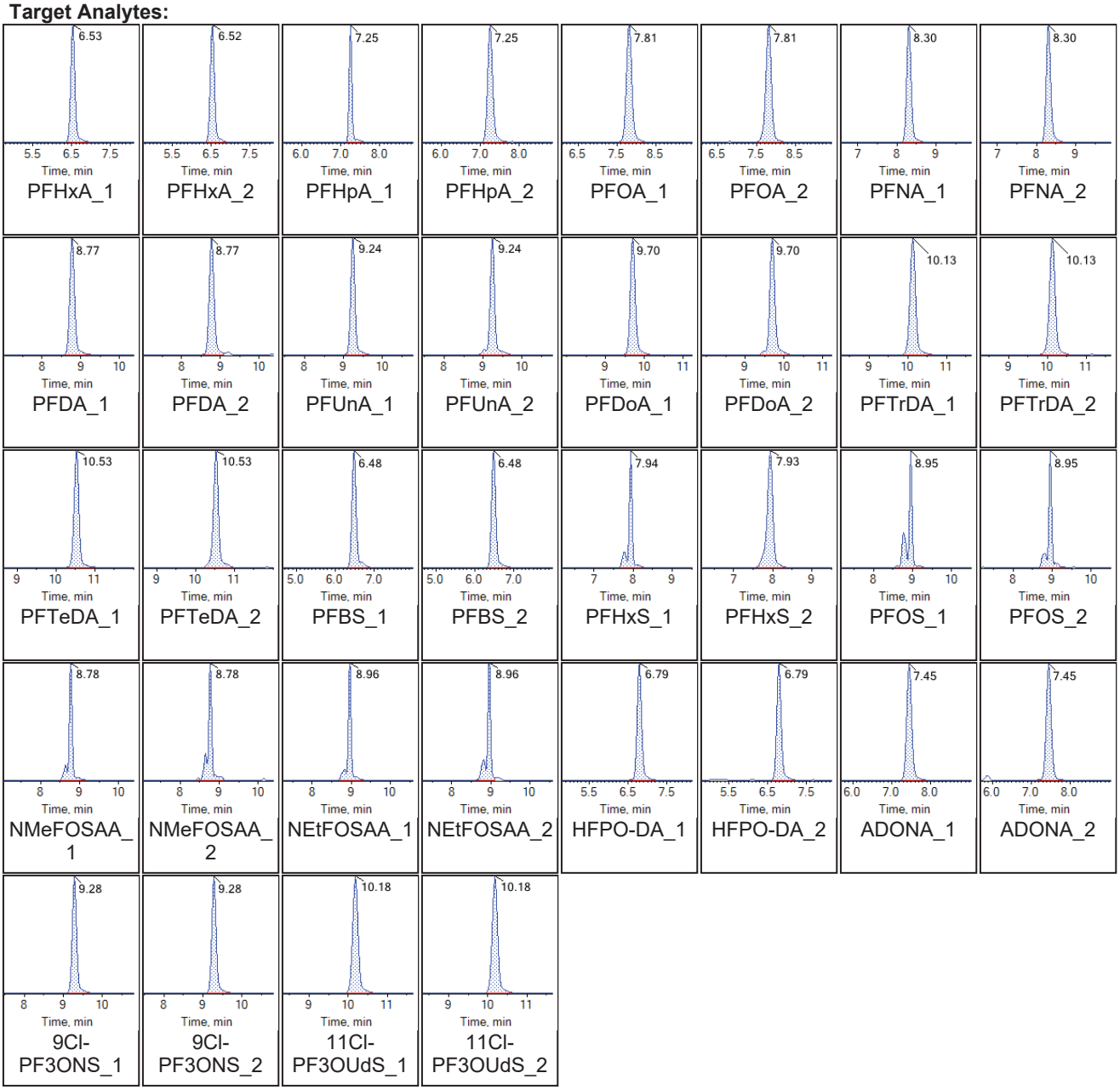


13C3-HFPO-DA

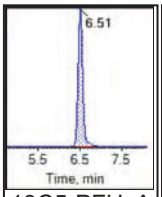
Sample Name	LZ88	**Injection Vial**	8
Sample ID	L6	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:01:53 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036

Chromatograms

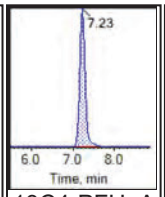
Target Analytes:



Internal Standards:



13C5-PFHxA



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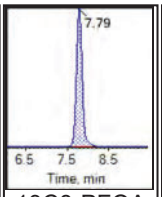
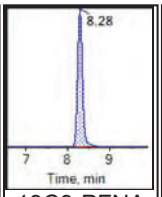
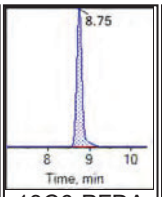


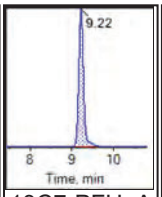
13C8-PFOA



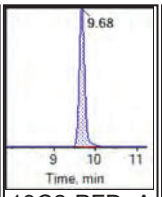
13C9-PFNA



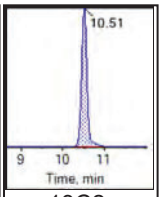
13C6-PFDA



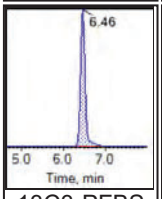
13C7-PFUnA



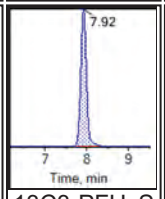
13C2-PFDoA



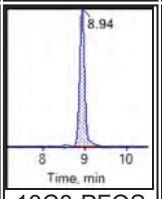
13C2-PFTeDA



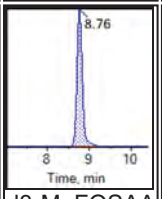
13C3-PFBS



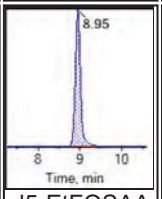
13C3-PFHxS



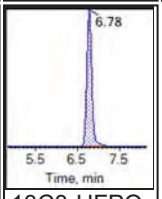
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA

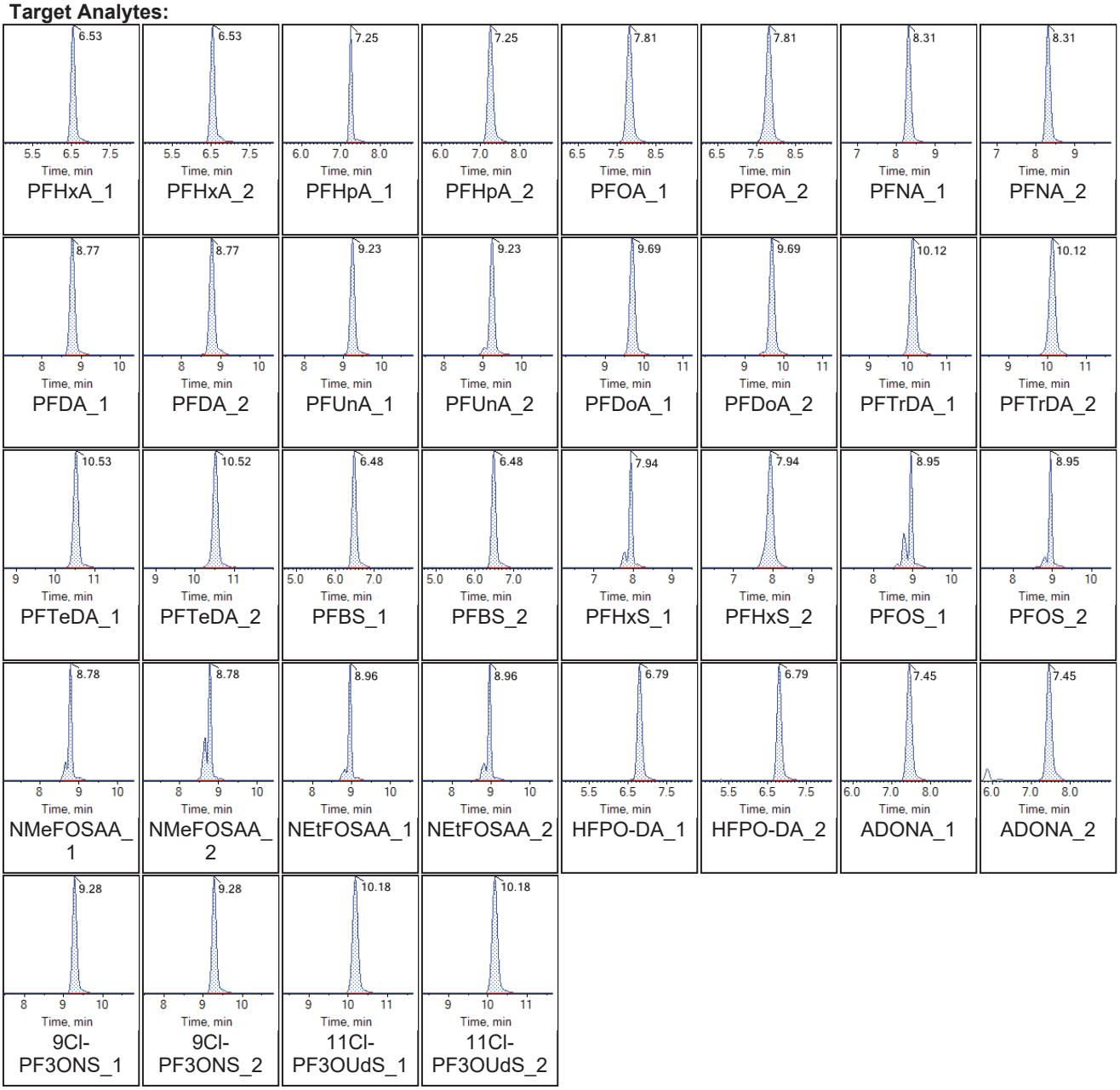


13C3-HFPO-DA

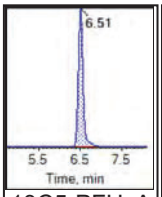
Sample Name	LZ89	**Injection Vial**	9
Sample ID	L7	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:17:57 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036

Chromatograms

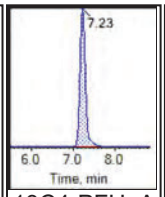
Target Analytes:



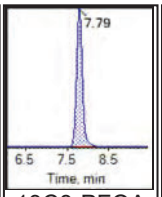
Internal Standards:



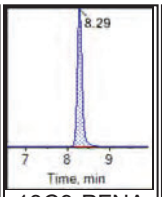
13C5-PFHxA



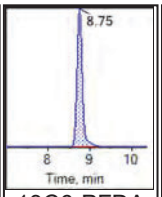
13C4-PFHpA



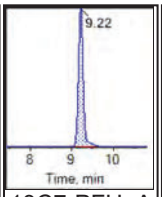
13C8-PFOA



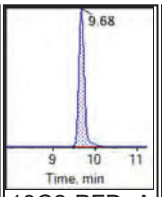
13C9-PFNA



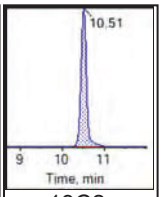
13C6-PFDA



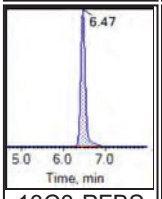
13C7-PFUnA



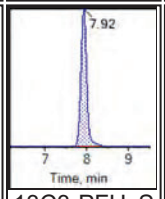
13C2-PFDoA



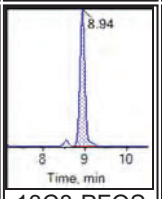
13C2-PFTeDA



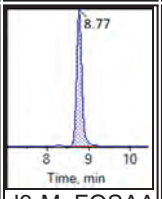
13C3-PFBS



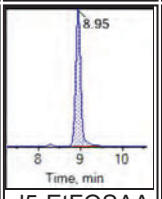
13C3-PFHxS



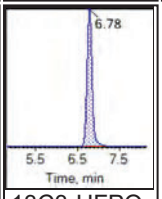
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA



13C3-HFPO-DA

Sample Name	LZ90	**Injection Vial**	10
Sample ID	L8	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:33:58 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036

Chromatograms

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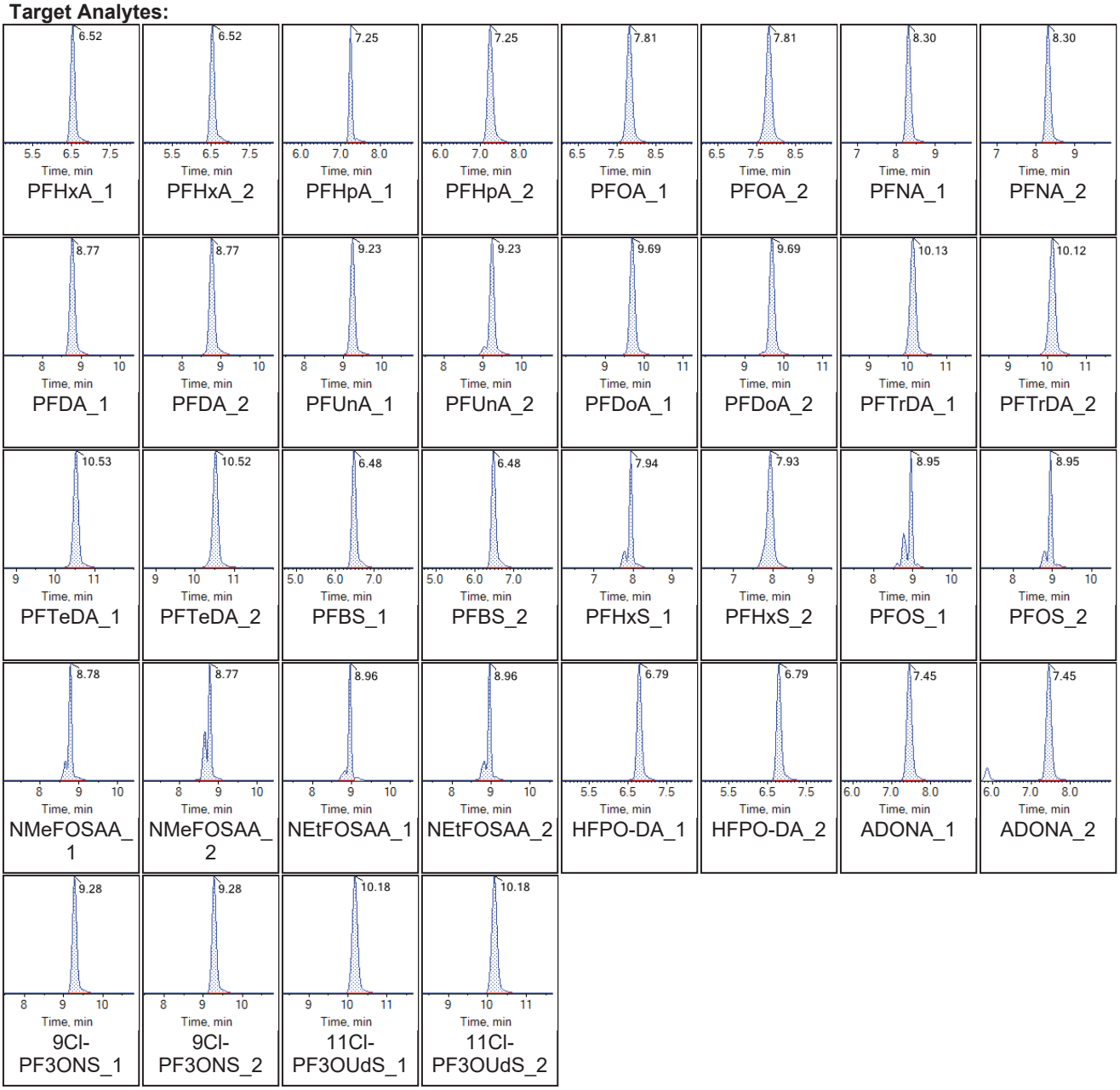
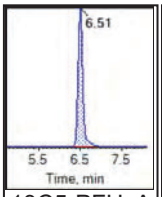
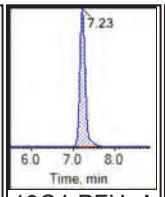


Internal Standards:



13C5-PFHxA



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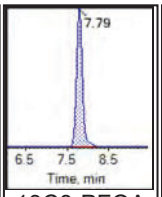
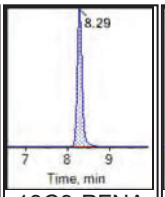
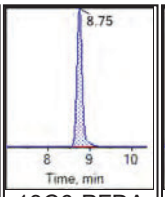


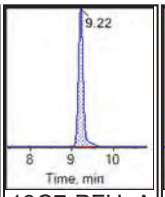
13C8-PFOA



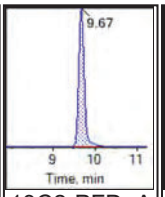
13C9-PFNA



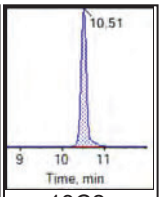
13C6-PFDA



13C7-PFUnA



13C2-PFDoA



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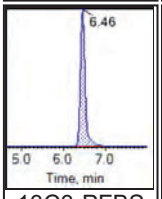
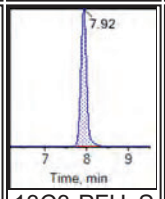
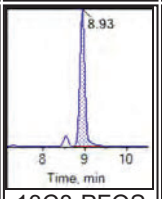


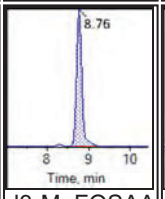
13C3-PFBS



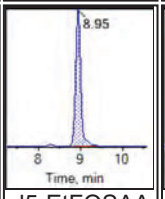
13C3-PFHxS



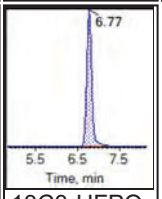
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA



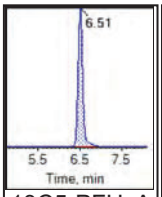
13C3-HFPO-DA

Sample Name	LZ91 IB	**Injection Vial**	11
Sample ID	Instrument Blank	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:49:57 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036

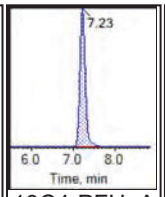
Chromatograms

Target Analytes:

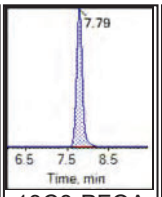
Internal Standards:



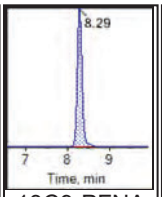
13C5-PFHxA



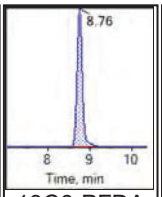
13C4-PFHpA



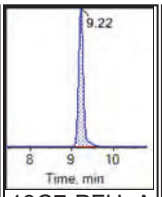
13C8-PFOA



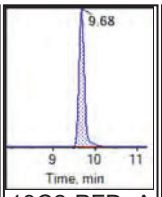
13C9-PFNA



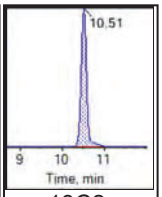
13C6-PFDA



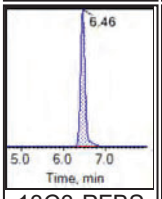
13C7-PFUnA



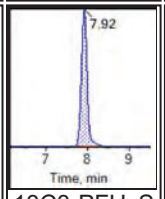
13C2-PFDoA



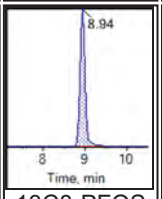
13C2-PFTeDA



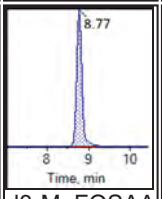
13C3-PFBS



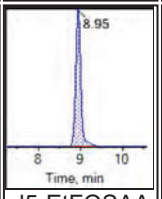
13C3-PFHxS



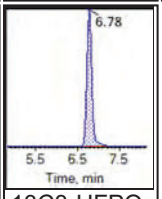
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA



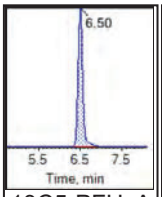
13C3-HFPO-DA

Sample Name	LZ92 ICC	**Injection Vial**	12
Sample ID	ICC	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 8:05:55 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036

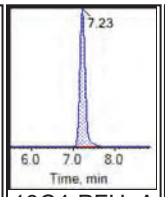
Chromatograms

Target Analytes:

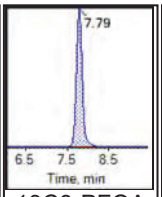
Internal Standards:



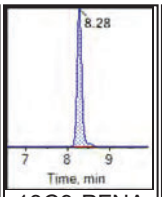
13C5-PFHxA



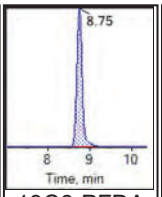
13C4-PFHpA



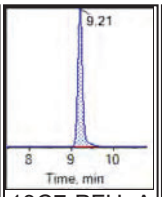
13C8-PFOA



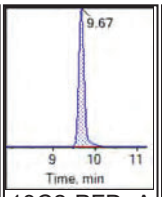
13C9-PFNA



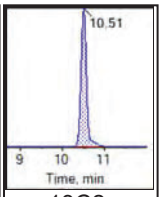
13C6-PFDA



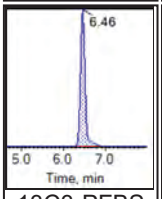
13C7-PFUnA



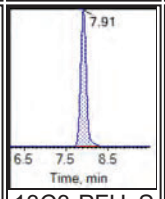
13C2-PFDoA



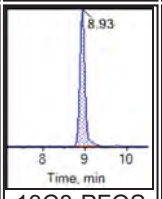
13C2-PFTeDA



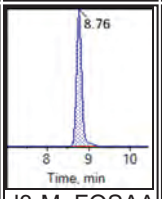
13C3-PFBS



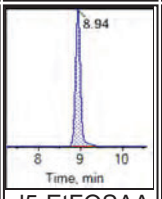
13C3-PFHxS



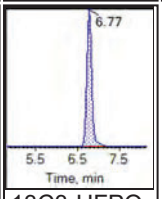
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA

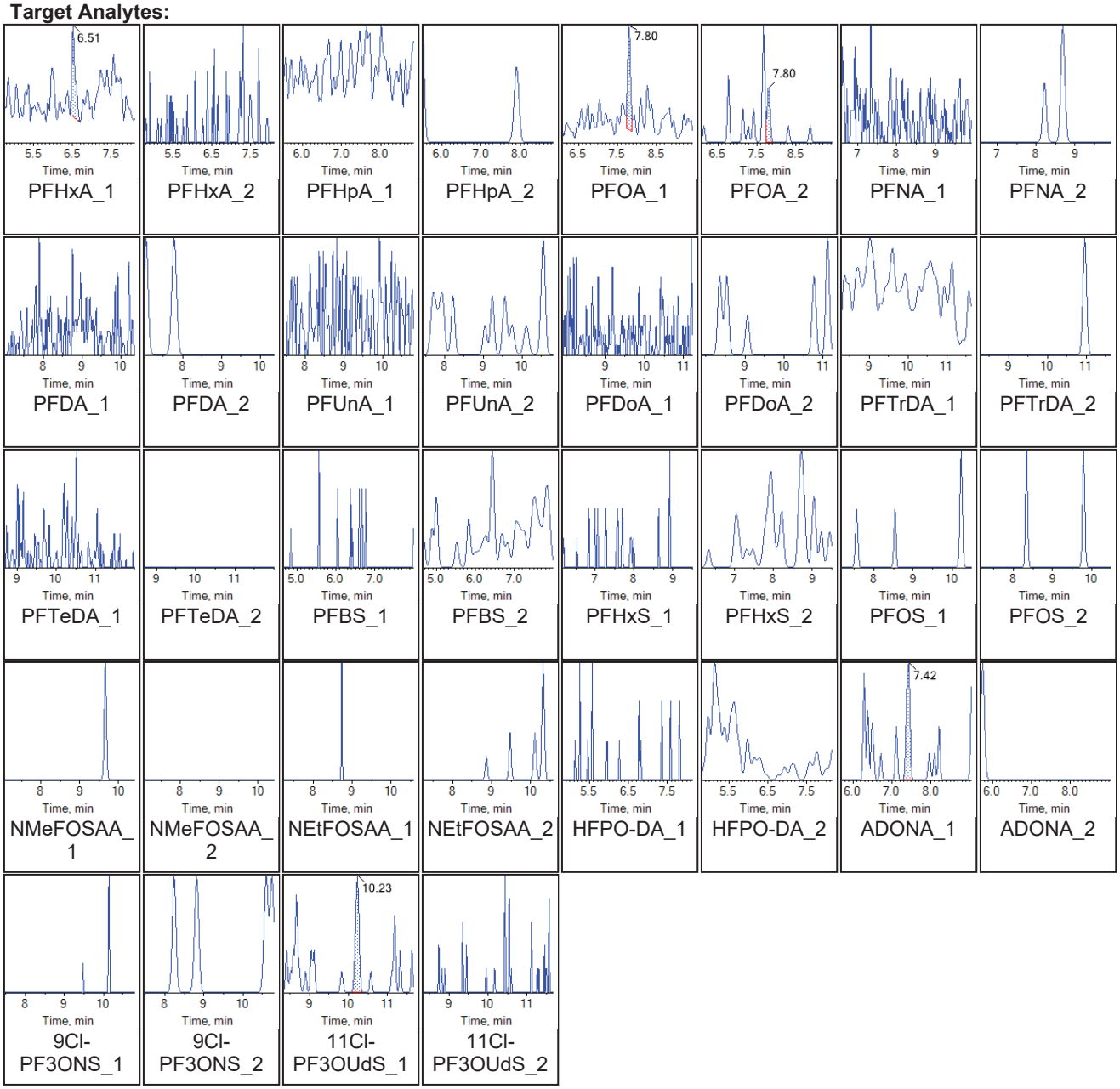


13C3-HFPO-DA

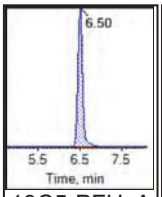
Sample Name	DO705PB-FS(0)	**Injection Vial**	17
Sample ID	Procedural Blank	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 9:26:15 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036

Chromatograms

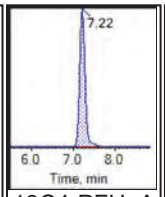
Target Analytes:



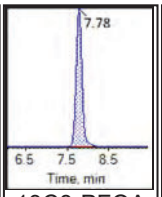
Internal Standards:



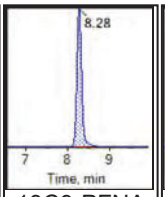
13C5-PFHxA



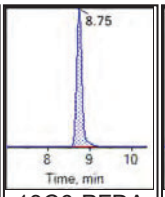
13C4-PFHpA



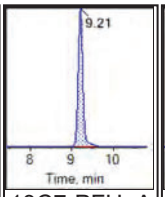
13C8-PFOA



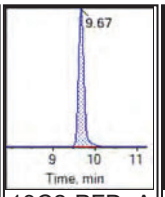
13C9-PFNA



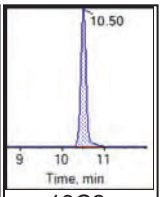
13C6-PFDA



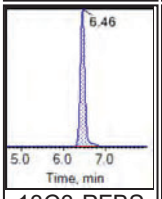
13C7-PFUnA



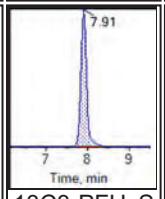
13C2-PFDoA



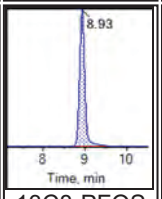
13C2-PFTeDA



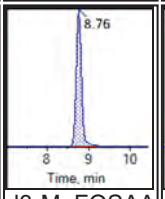
13C3-PFBS



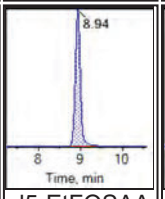
13C3-PFHxS



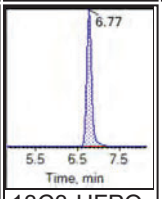
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA



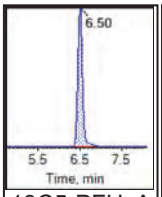
13C3-HFPO-DA

Sample Name	DO706LCS-FS(0)	**Injection Vial**	18
Sample ID	Laboratory Control Sample	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 9:42:20 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036

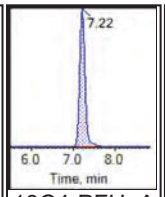
Chromatograms

Target Analytes:

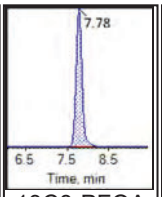
Internal Standards:



13C5-PFHxA



13C4-PFHpA



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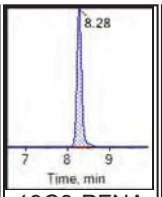
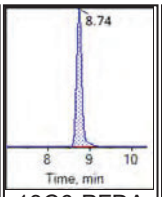
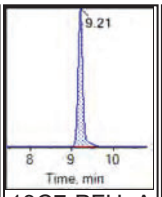


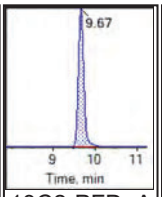
13C9-PFNA



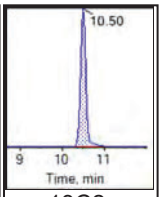
13C6-PFDA



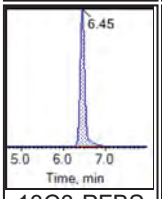
13C7-PFUnA



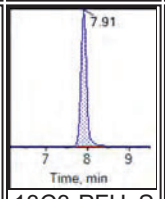
13C2-PFDoA



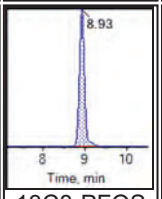
13C2-PFTeDA



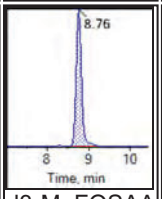
13C3-PFBS



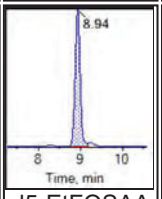
13C3-PFHxS



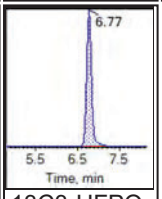
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA

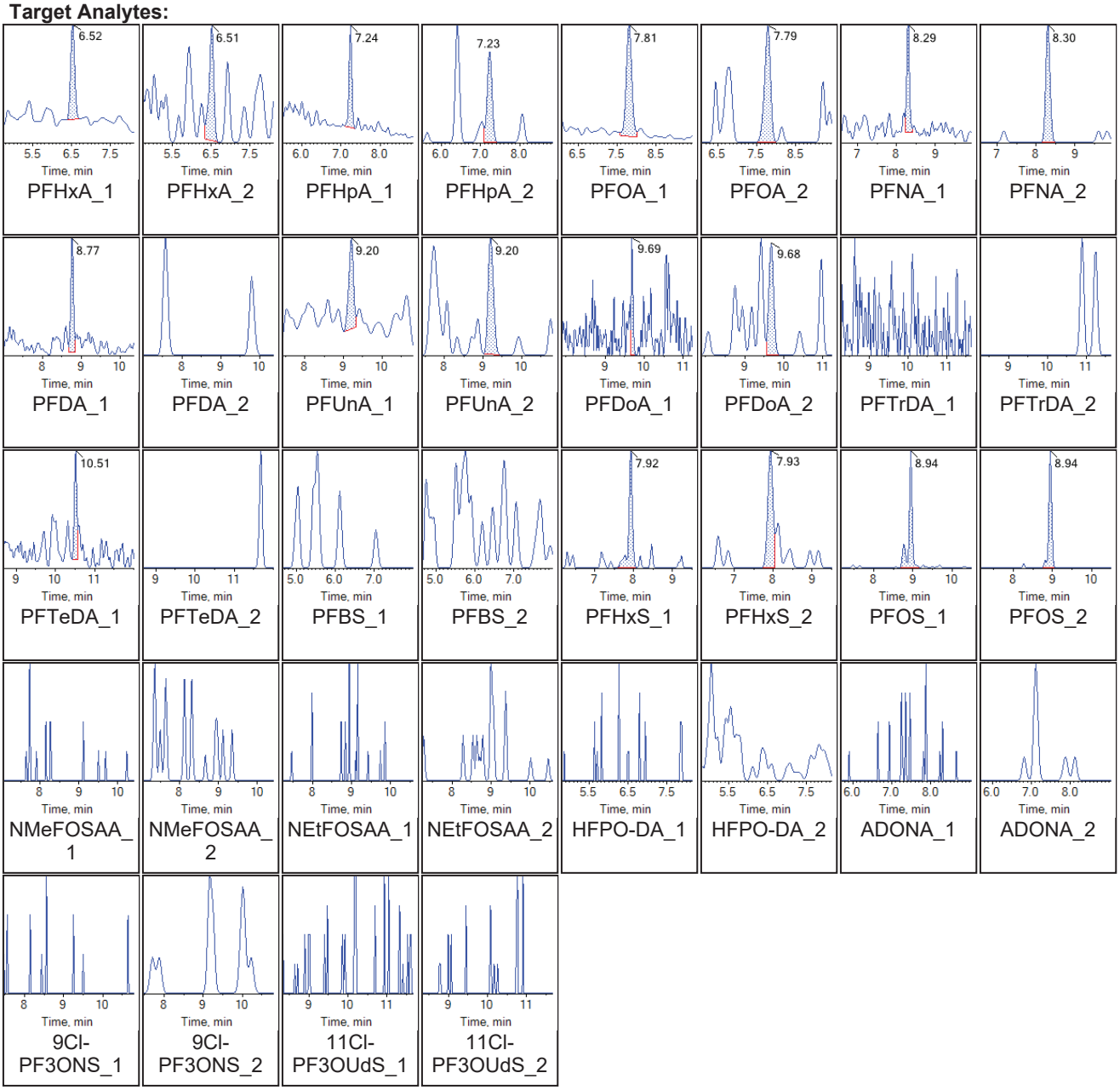


13C3-HFPO-DA

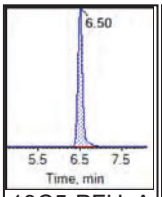
Sample Name	D7904-FS(0)	**Injection Vial**	19
Sample ID	NBKK-B76-IDW01-SO-081523	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 9:58:24 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036

Chromatograms

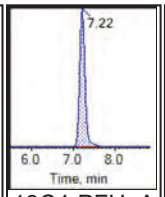
Target Analytes:



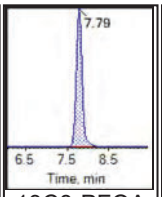
Internal Standards:



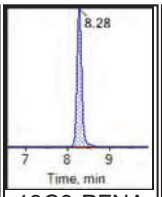
13C5-PFHxA



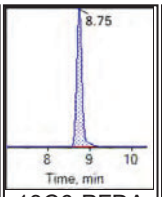
13C4-PFHpA



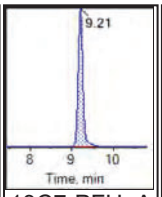
13C8-PFOA



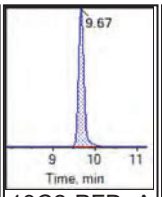
13C9-PFNA



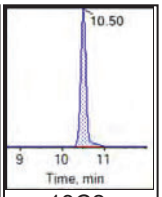
13C6-PFDA



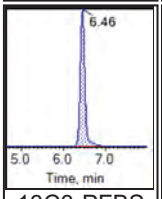
13C7-PFUnA



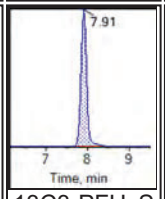
13C2-PFDoA



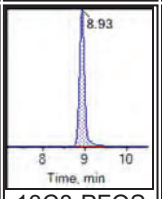
13C2-PFTeDA



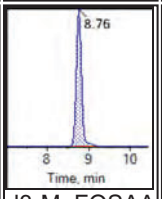
13C3-PFBS



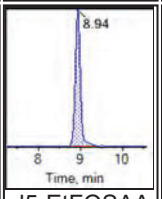
13C3-PFHxS



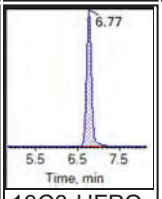
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA



13C3-HFPO-DA

Sample Name	D7905-FS(0)	**Injection Vial**	20
Sample ID	NBKK-B76-IDW02-SO-081623	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 10:14:27 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036

Chromatograms

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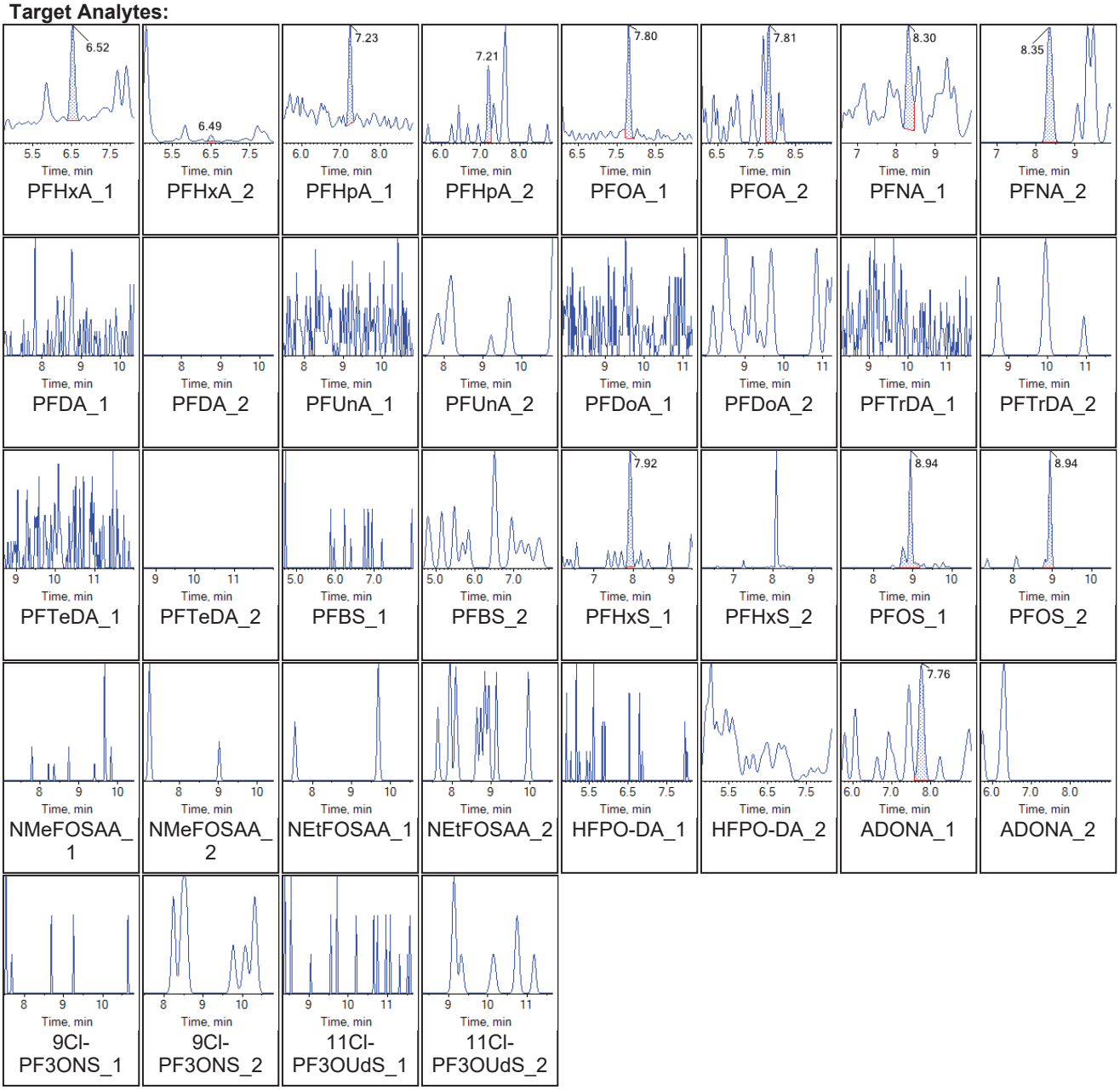
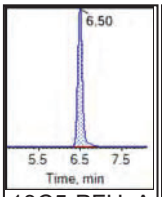
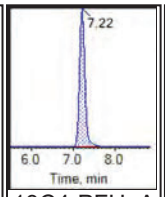


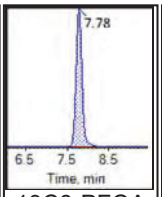
Internal Standards:



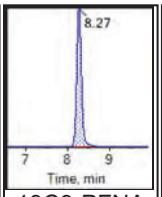
13C5-PFHxA



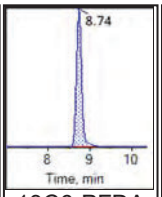
13C4-PFHpA



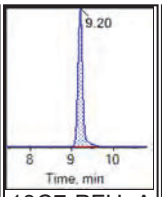
13C8-PFOA



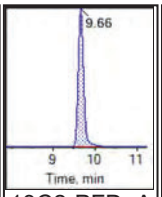
13C9-PFNA



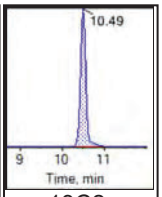
13C6-PFDA



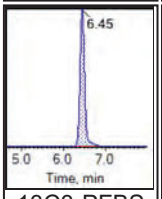
13C7-PFUnA



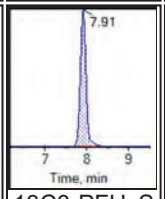
13C2-PFDoA



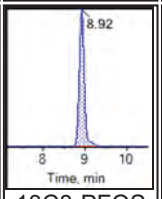
13C2-PFTeDA



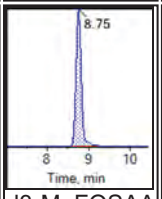
13C3-PFBS



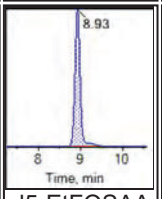
13C3-PFHxS



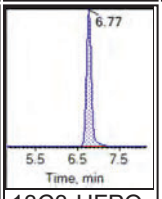
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA

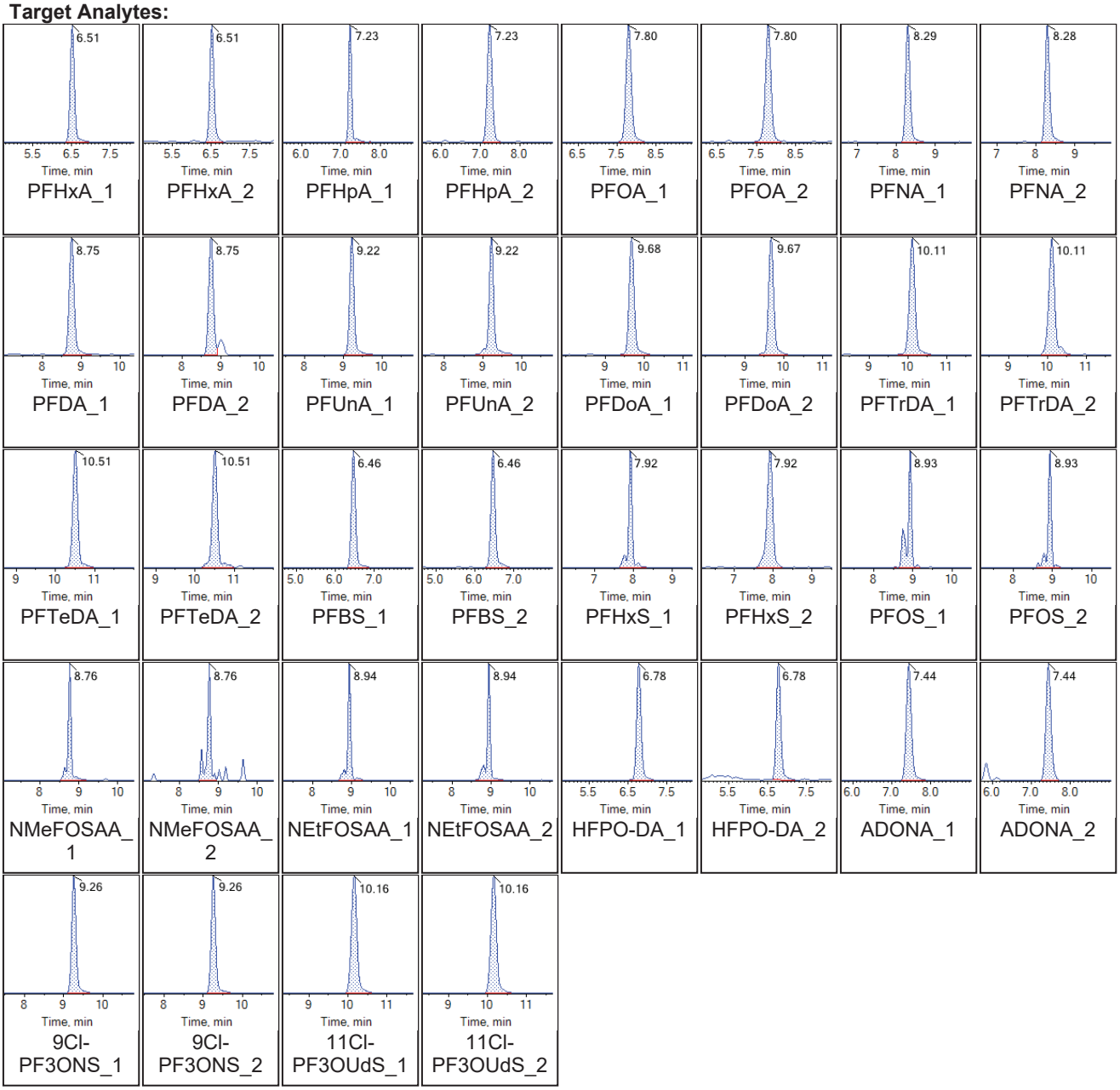


13C3-HFPO-DA

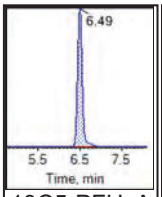
Sample Name	LZ87 CCV	**Injection Vial**	24
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 11:18:41 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036

Chromatograms

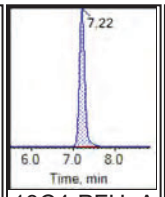
Target Analytes:



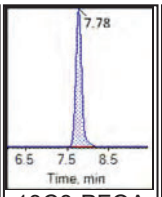
Internal Standards:



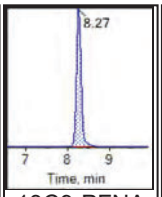
13C5-PFHxA



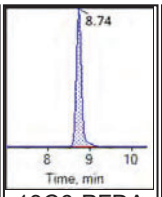
13C4-PFHpA



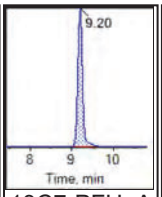
13C8-PFOA



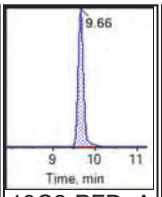
13C9-PFNA



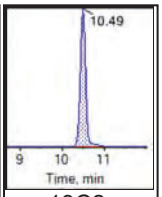
13C6-PFDA



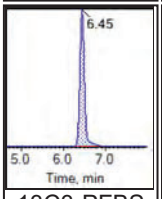
13C7-PFUnA



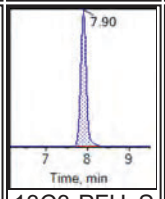
13C2-PFDoA



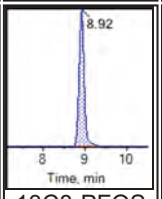
13C2-PFTeDA



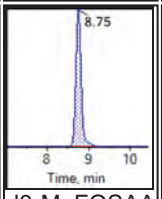
13C3-PFBS



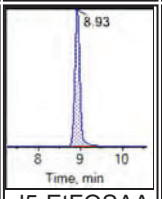
13C3-PFHxS



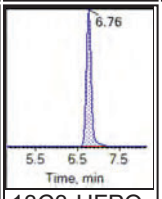
13C8-PFOS



d3-MeFOSAA



d5-EtFOSAA

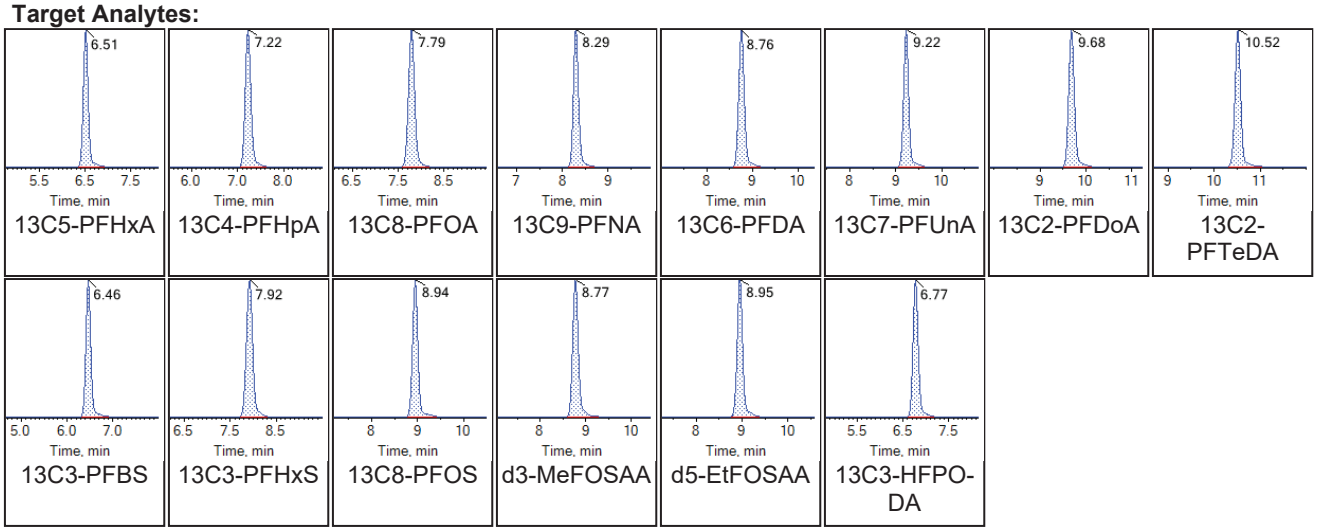


13C3-HFPO-DA

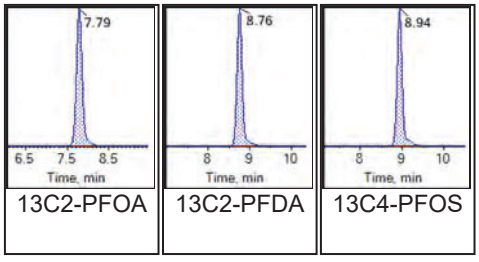
Sample Name	LZ83	**Injection Vial**	3
Sample ID	L1	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:41:38 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS

Chromatograms

Target Analytes:



Internal Standards:



Sample Name	LZ84	**Injection Vial**	4
Sample ID	L2	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 5:57:41 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS

Chromatograms

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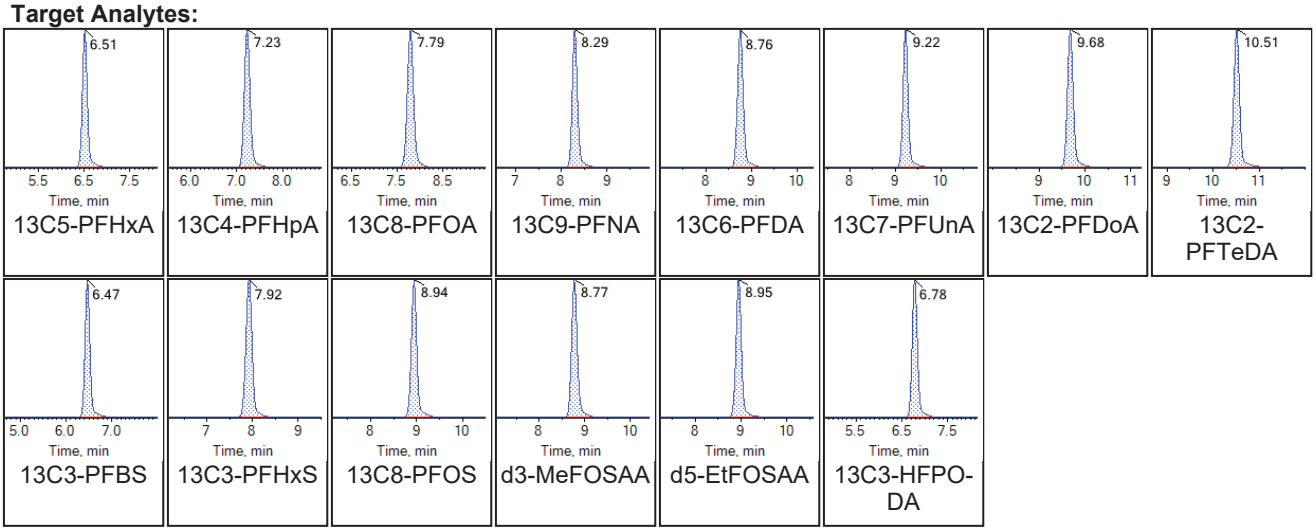
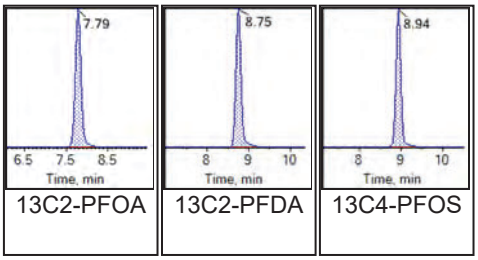


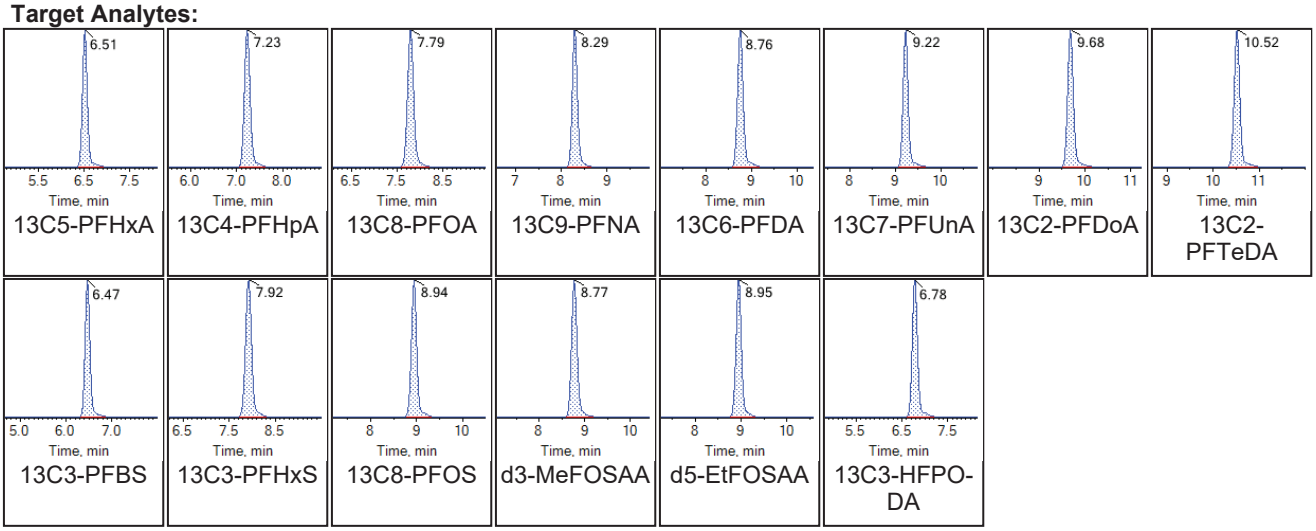
Internal Standards:



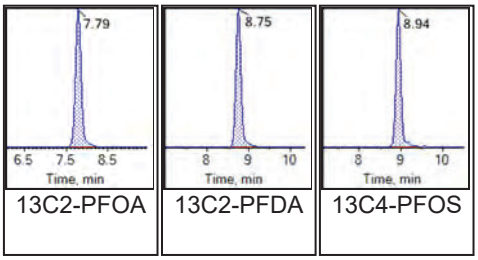
Sample Name	LZ85	**Injection Vial**	5
Sample ID	L3	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 6:13:44 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS

Chromatograms

Target Analytes:



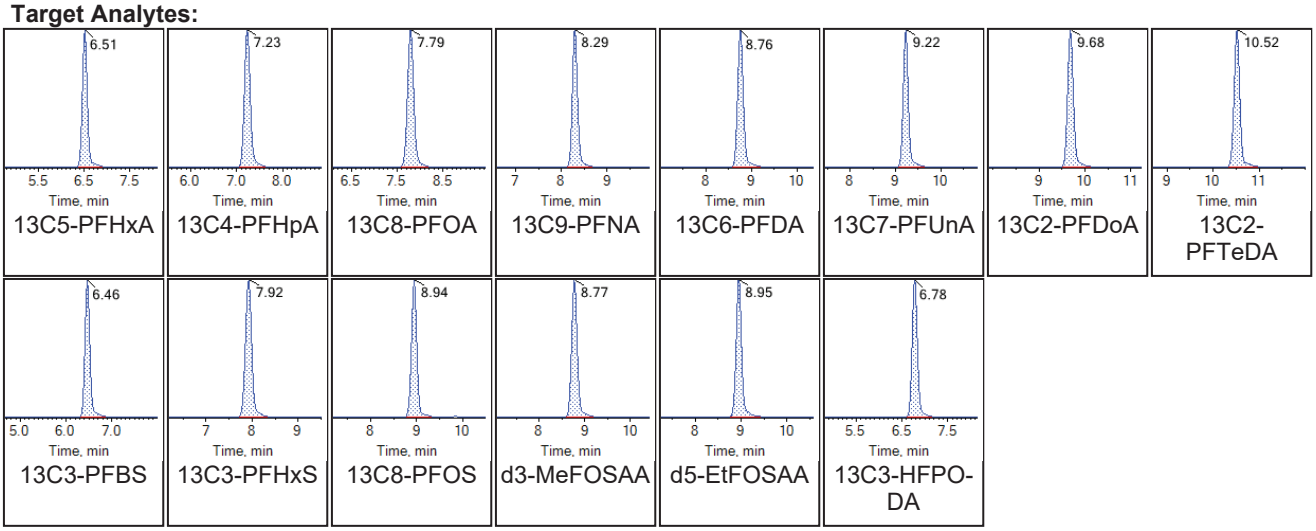
Internal Standards:



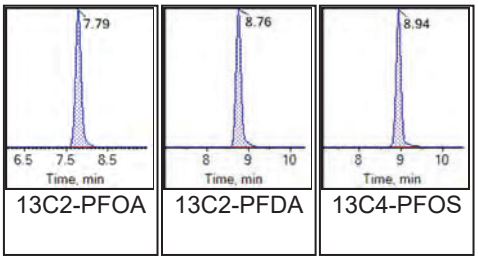
Sample Name	LZ86	**Injection Vial**	6
Sample ID	L4	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 6:29:47 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS

Chromatograms

Target Analytes:



Internal Standards:



Sample Name	LZ87	**Injection Vial**	7
Sample ID	L5	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 6:45:50 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS

Chromatograms

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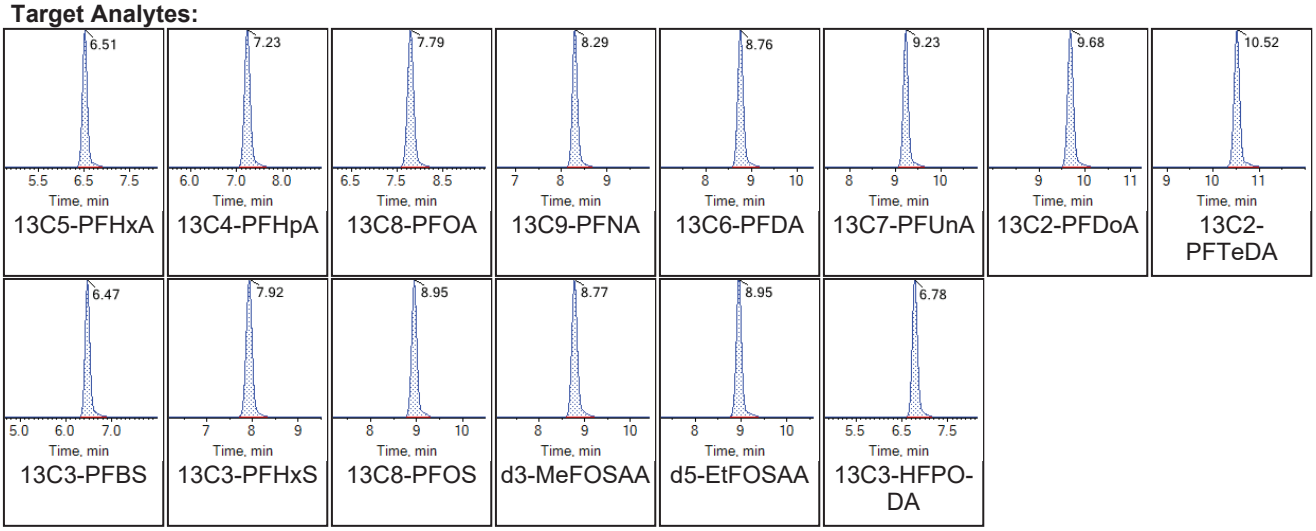

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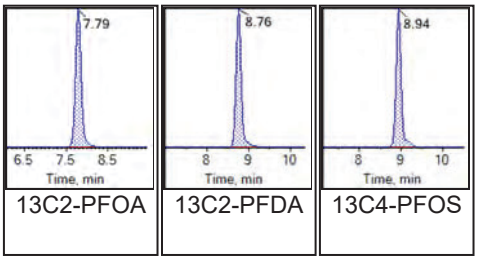
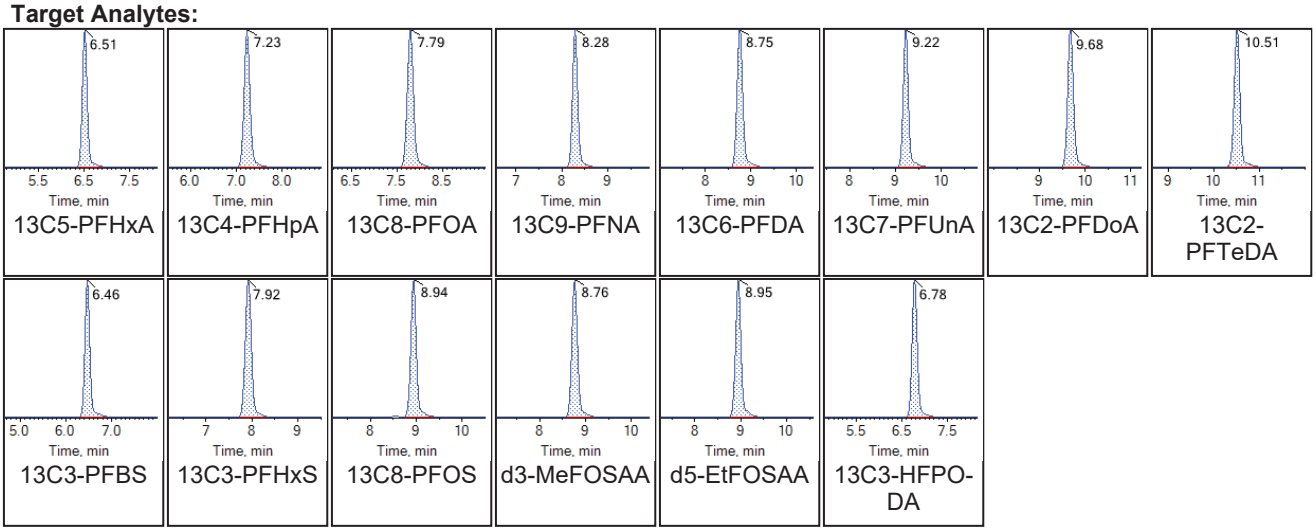


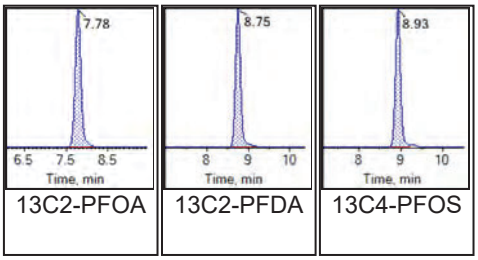
Sample Name	LZ88	**Injection Vial**	8
Sample ID	L6	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:01:53 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS

Chromatograms

Target Analytes:



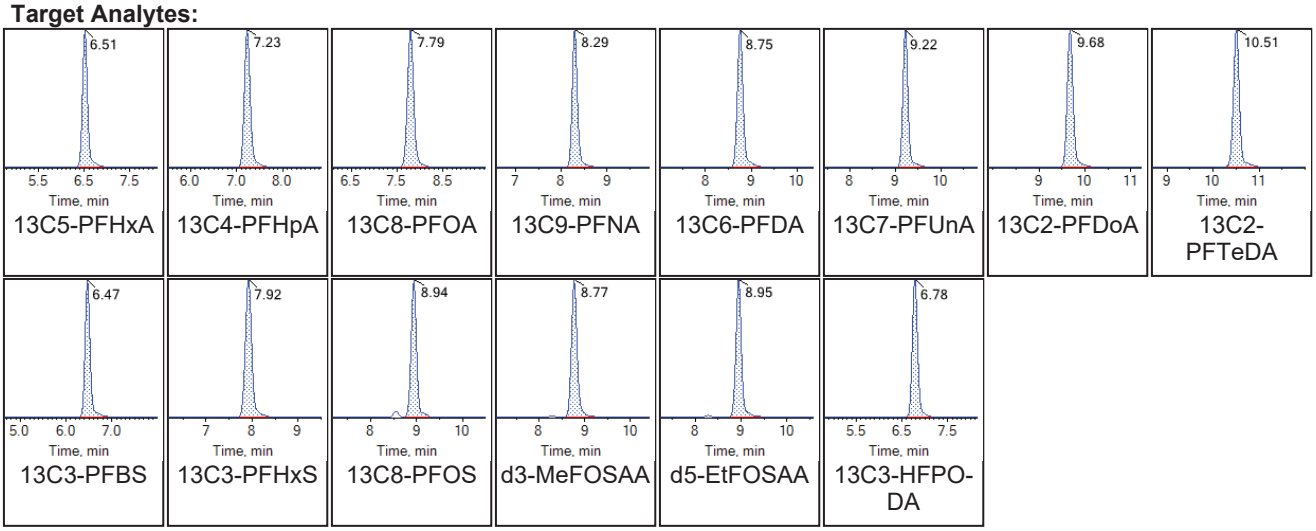
Internal Standards:



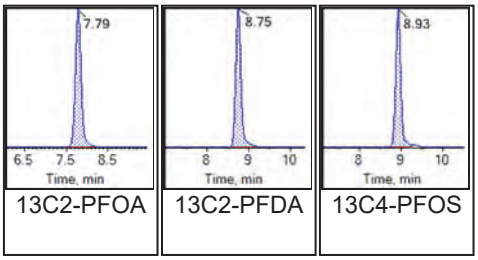
Sample Name	LZ89	**Injection Vial**	9
Sample ID	L7	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:17:57 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS

Chromatograms

Target Analytes:



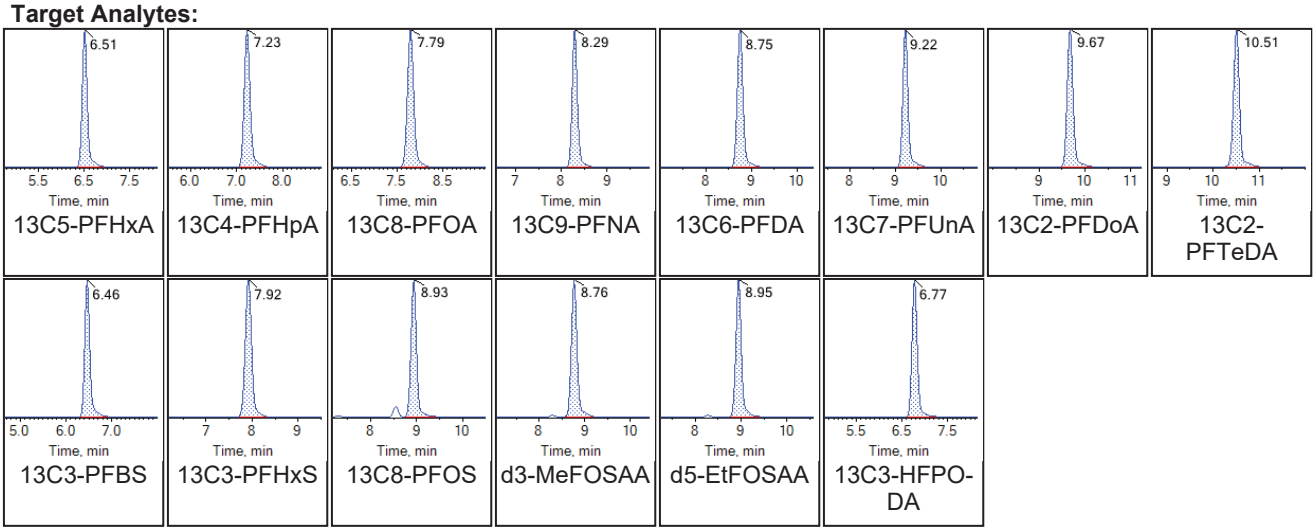
Internal Standards:



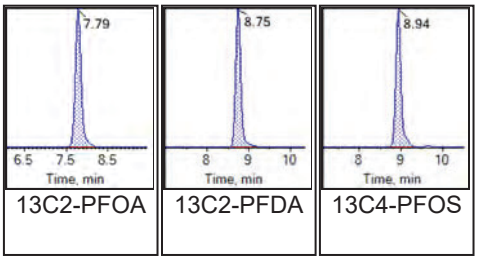
Sample Name	LZ90	**Injection Vial**	10
Sample ID	L8	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:33:58 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS

Chromatograms

Target Analytes:



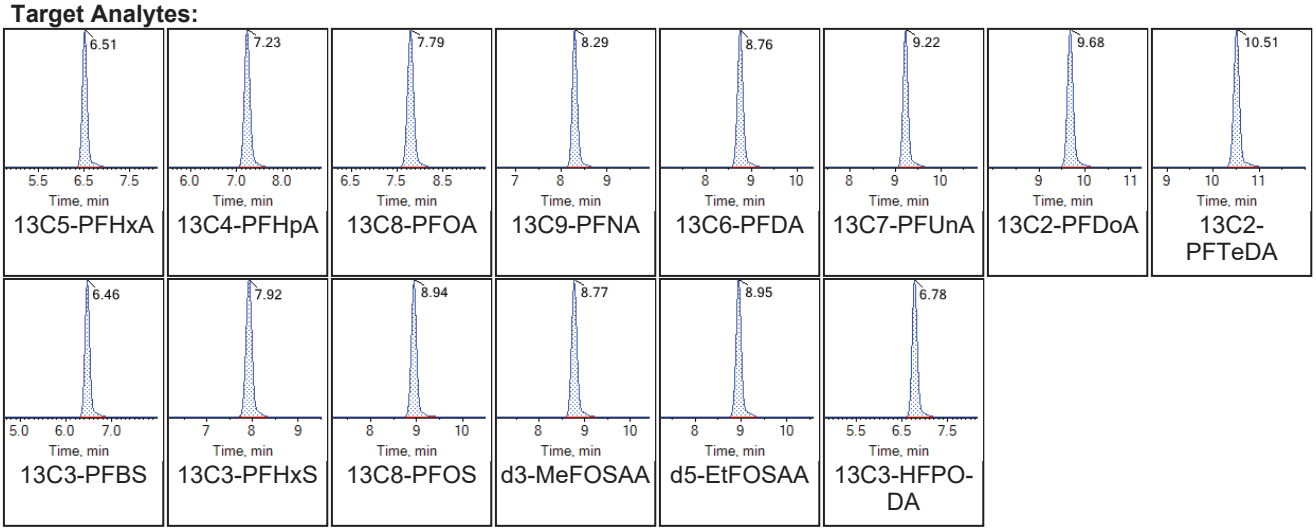
Internal Standards:



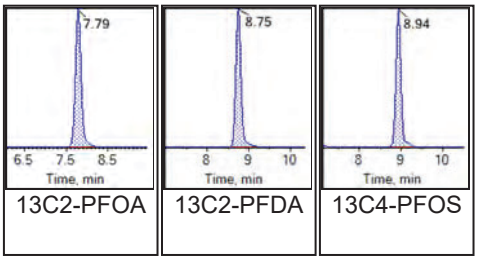
Sample Name	LZ91 IB	**Injection Vial**	11
Sample ID	Instrument Blank	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 7:49:57 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS

Chromatograms

Target Analytes:



Internal Standards:



Sample Name	LZ92 ICC	**Injection Vial**	12
Sample ID	ICC	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 8:05:55 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS

Chromatograms

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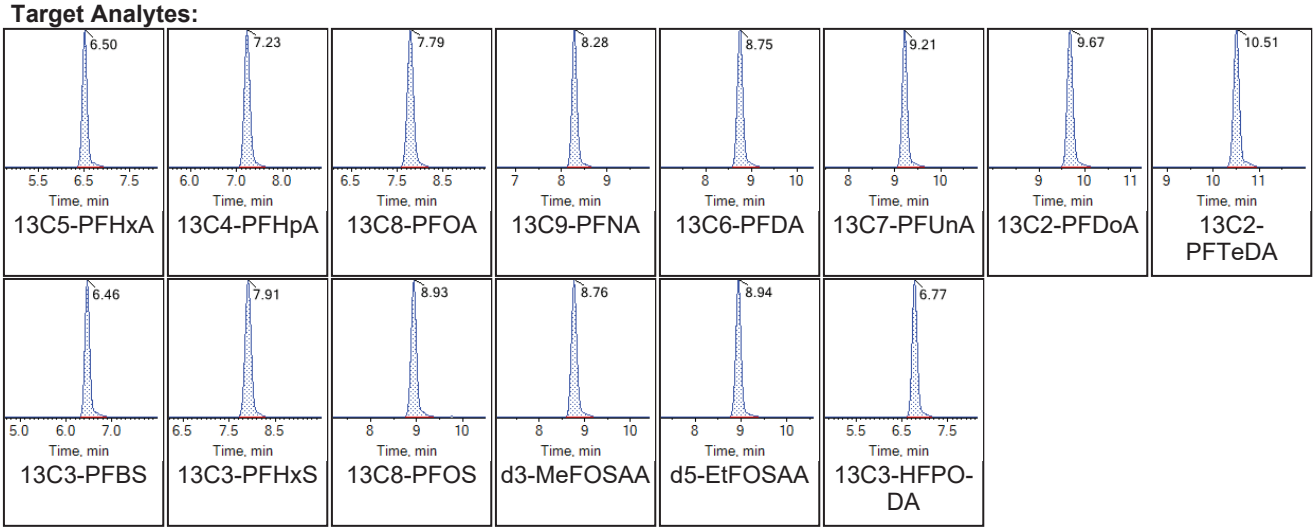
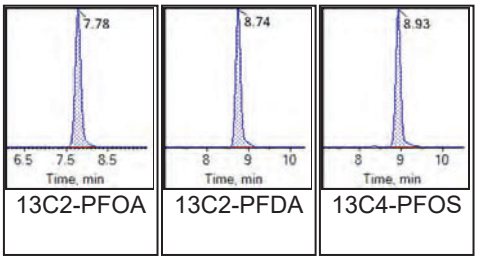


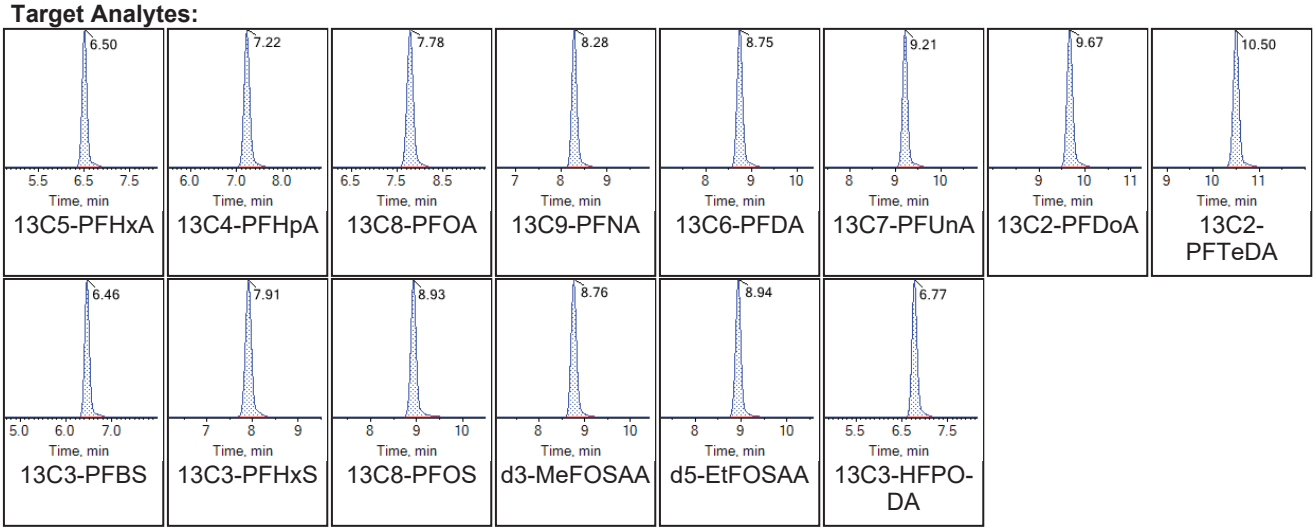
Internal Standards:



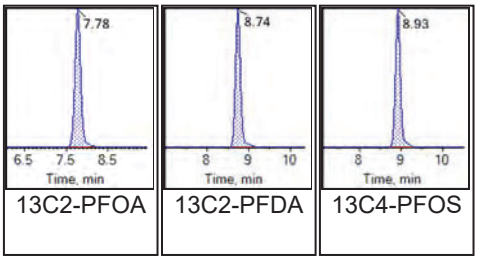
Sample Name	DO705PB-FS(0)	**Injection Vial**	17
Sample ID	Procedural Blank	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 9:26:15 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS

Chromatograms

Target Analytes:



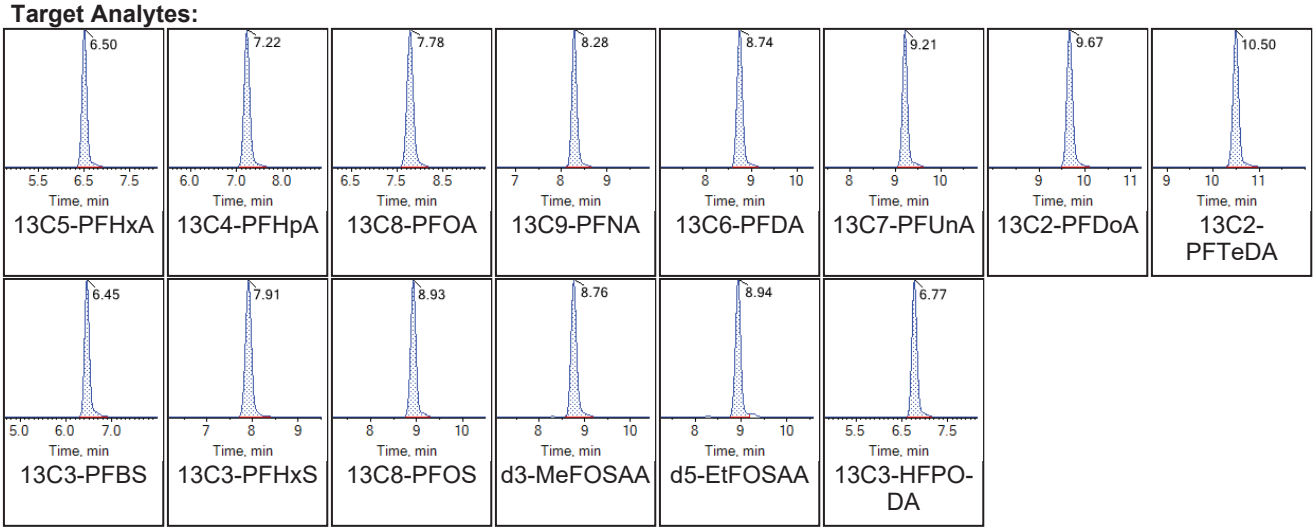
Internal Standards:



Sample Name	DO706LCS-FS(0)	**Injection Vial**	18
Sample ID	Laboratory Control Sample	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 9:42:20 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS

Chromatograms

Target Analytes:



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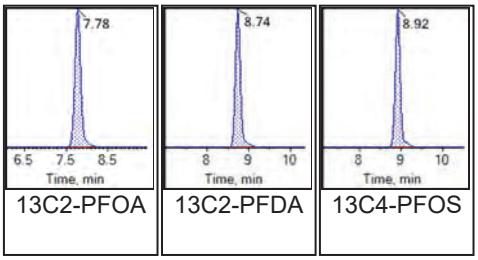

Sample Name	D7904-FS(0)	**Injection Vial**	19
Sample ID	NBKK-B76-IDW01-SO-0815823	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 9:58:24 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS

Chromatograms

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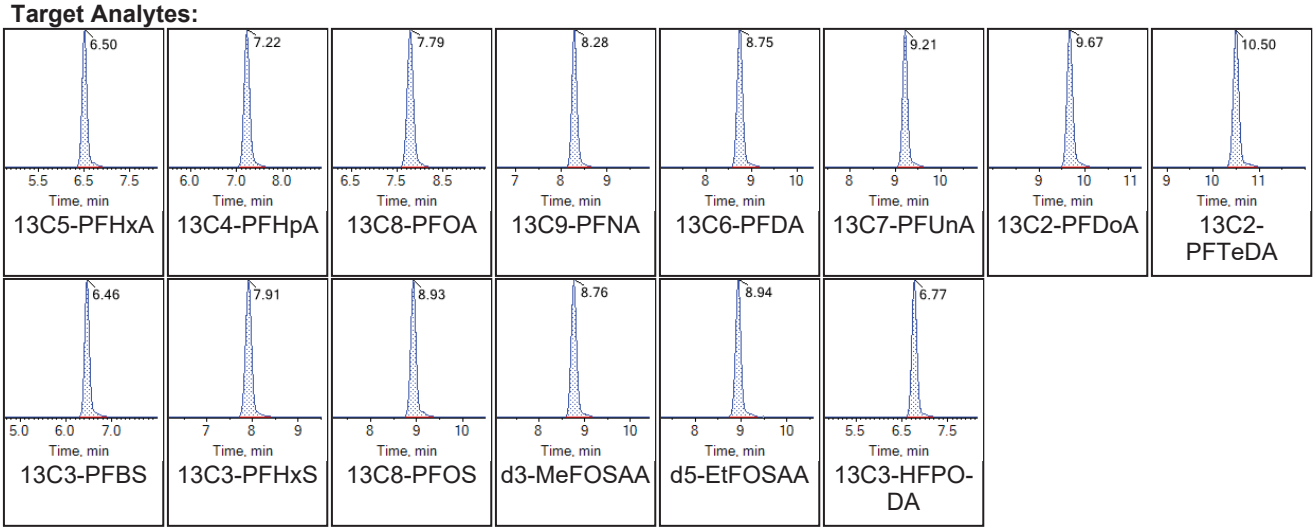

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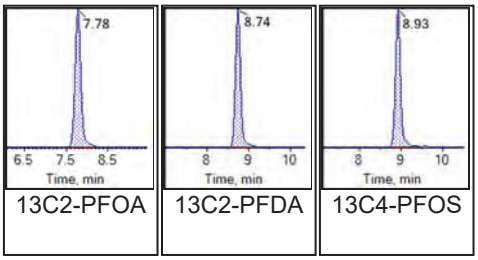
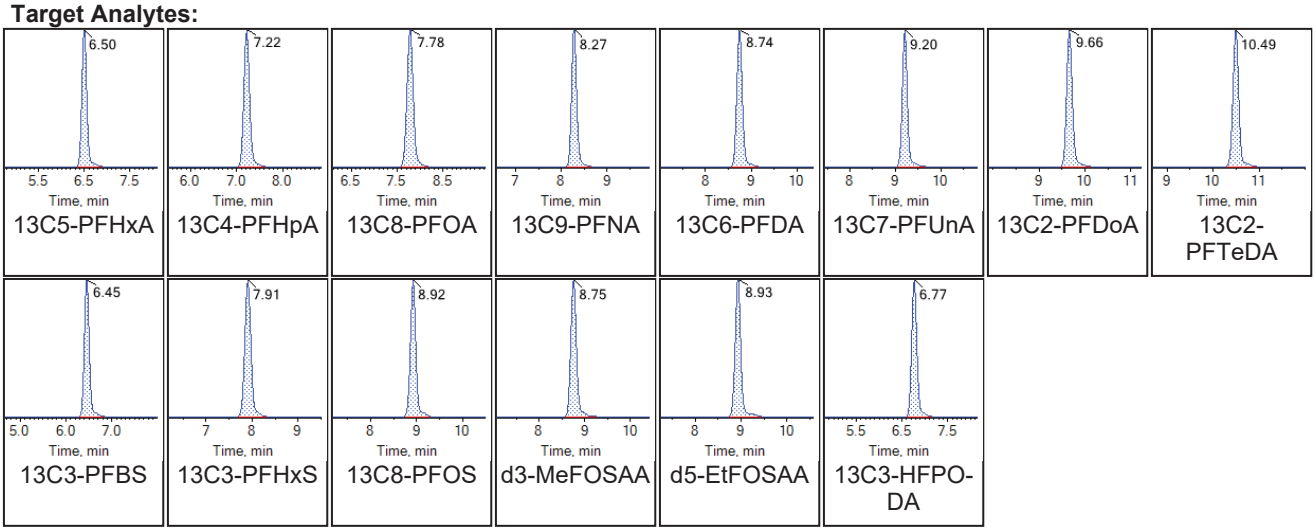


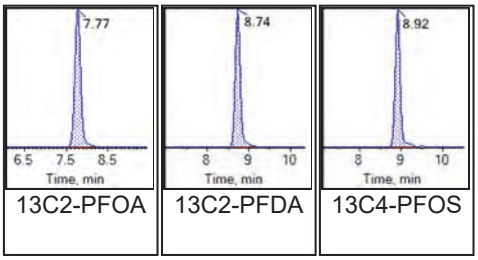
Sample Name	D7905-FS(0)	**Injection Vial**	20
Sample ID	NBKK-B76-IDW02-SO-0816823	**Injection Volume**	5.00
Sample Type	Unknown	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 10:14:27 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS

Chromatograms

Target Analytes:



Internal Standards:



Sample Name	LZ87 CCV	**Injection Vial**	24
Sample ID	CCV	**Injection Volume**	5.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/22/2023 11:18:41 PM	**Data File**	AD_08222023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1036_SIS

Chromatograms

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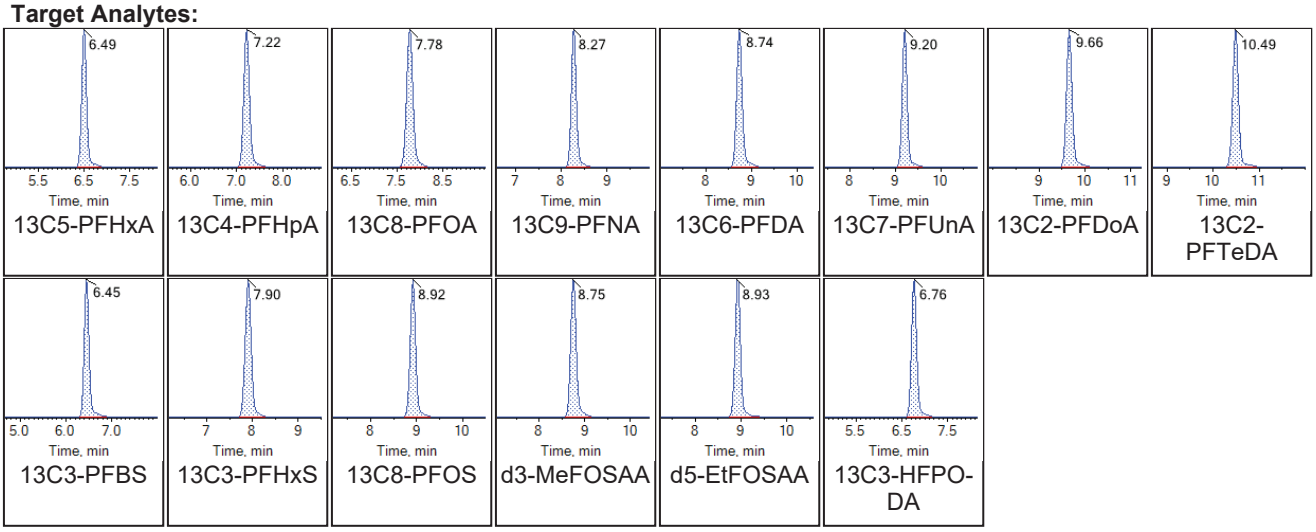

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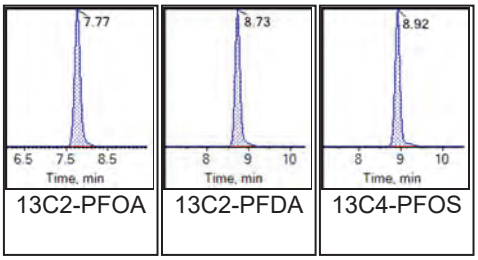

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ANALYTICAL REPORT

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Gainesville, Florida 32608-3964

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NBK Keyport
SDG NUMBER 410-139657

JOB NUMBER

410-139657-1

Eurofins Lancaster Laboratories Environment Testing, LLC
2425 New Holland Pike
Lancaster PA 17601

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Authorization

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Authorized for release by
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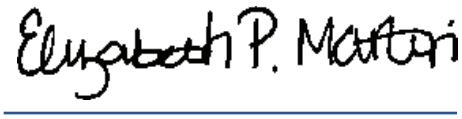
Compliance Statement

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is 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.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	See Case Narrative
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC/MS Semi VOA

Qualifier	Qualifier Description
*	See Case Narrative
B	Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC VOA

Qualifier	Qualifier Description
*	See Case Narrative
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
*	See Case Narrative
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
*	See Case Narrative
B	Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
*	See Case Narrative
HF	Parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. Sample was analyzed outside of hold time.
U	Undetected at the Limit of Detection.

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)

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
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

Job ID: 410-139657-1

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Narrative

Job Narrative
410-139657-1

Receipt
The samples were received on 8/19/2023 9:50 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 4 coolers at receipt time were 0.8°C, 0.9°C, 1.8°C and 3.8°C

Receipt Exceptions
Per client instruction 08/21/23 12:27 PM, please update sample IDs to reflect the following: NBKK-B76-IDW01A-AQ-081723 (410-139657-1), NBKK-B76-IDW02A-AQ-081723 (410-139657-2), NBKK-B76-IDW01A-SO-081723 (410-139657-3) and NBKK-B76-IDW02A-SO-081723 (410-139657-4).

SUBCONTRACTING
The following analysis was subcontracted to ALS Environmental: Total Organic Halogens

GC/MS VOA
Method 8260D_DOD5: The response for 1,2-Dichloroethane in the continuing calibration verification (CCV) marginally exceeds, low-biased, the DoD acceptance criteria on batch 410-419687. Due to the marginal nature of the outlier(s), the data is reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC/MS Semi VOA
Method 8270E_DOD5: The continuing calibration verification (CCV) associated with batch 410-415464 recovered above the upper control limit for Pentachlorophenol. The sample associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. Associated sample: NBKK-B76-IDW02A-SO-081723 (410-139657-4).

Method 8270E_SIM_DOD5: Surrogate recovery for the following sample was outside control limits: NBKK-B76-IDW01A-AQ-081723 (410-139657-1). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Method 8270E_SIM_DOD5: Internal standard (ISTD) response for the following sample(s) associated with 410-411891 was outside of acceptance limits: NBKK-B76-IDW01A-AQ-081723 (410-139657-1) and NBKK-B76-IDW02A-AQ-081723 (410-139657-2). The incorrect amount of internal standard was added to the samples. The concentrations were adjusted accordingly and the data reported.

Method 8270E_SIM_DOD5: Surrogate recovery for the following sample was outside control limits in the first extraction: NBKK-B76-IDW01A-SO-081723 (410-139657-3). Re-extraction and re-analysis was performed within the method required holding time with acceptable results. The method blank associated with the re-extracted sample, preparation batch 410-414987, contained 1-Methylnaphthalene and 2-Methylnaphthalene above the method detection limit (MDL). Both sets of data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC VOA
Method NWTPH_Gx: The method requirement for no headspace was not met. The following volatile sample was analyzed with headspace in the sample container(s): NBKK-B76-IDW01A-AQ-081723 (410-139657-1).

Method NWTPH_Gx: Elevated reporting limits are provided for the following sample due to insufficient sample provided for reanalysis: NBKK-B76-IDW01A-SO-081723 (410-139657-3).

Method NWTPH_Gx: The following volatiles sample was diluted due to foaming at the time of purging during the original sample analysis: NBKK-B76-IDW02A-SO-081723 (410-139657-4). Elevated reporting limits (RLs) are provided.

Method NWTPH_Gx: The closing continuing calibration verification (CCVC) associated with batch 410-411048 recovered outside the control limit for C7-C12.

Job ID: 410-139657-1 (Continued)

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC Semi VOA

Method NWTPH_Dx: Surrogate recovery for the following sample(s) were outside control limits (low): NBKK-B76-IDW01A-AQ-081723 (410-139657-1) and (410-139657-C-1-A DU). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed. Background and duplicate samples confirm.

Method NWTPH_Dx: The software does not display the % Drift data to the whole number as is listed in the method (i.e. limit of 15 %). When the -15.1% drift is evaluated to the whole number, the continuing calibration verification (CCV) passes the method criteria for C12-C24. The associated sample(s) are: NBKK-B76-IDW01A-AQ-081723 (410-139657-1), NBKK-B76-IDW02A-AQ-081723 (410-139657-2) and (410-139657-C-1-A DU).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

PCBs

Method 8082A_DOD5: The continuing calibration verification (CCV) associated with batch 410-414664 recovered above the upper control limit for DCB Decachlorobiphenyl (Surr) on one column. Results are reported from the passing column. The associated sample(s) are: NBKK-B76-IDW01A-AQ-081723 (410-139657-1), NBKK-B76-IDW02A-AQ-081723 (410-139657-2), NBKK-B76-IDW01A-SO-081723 (410-139657-3), NBKK-B76-IDW02A-SO-081723 (410-139657-4), (LCS 410-414140/2-A), (LCSD 410-414140/3-A) and (MB 410-414140/1-A).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals

Method 6020B_DOD5: The TCLP leachate blank for batch 410-414261, 410-415155 and 410-415704 contained Barium above the LOQ.This target analyte concentration was less than the TCLP Regulatory Hazard Limit as well as the laboratory action limit. The associated sample(s) were also below the TCLP Regulatory Hazard Limit for this analyte; therefore, re-extraction was not performed. Associated sample(s): NBKK-B76-IDW01A-SO-081723 (410-139657-3) and NBKK-B76-IDW02A-SO-081723 (410-139657-4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

Method 1010A: The Pensky Martens closed cup apparatus is designed to determine the flash point of a liquid sample. The sample submitted could not be mixed well enough to obtain uniform heating. The temperature being measured was that of the material near the top of the cup. The material at the bottom of the cup could have a higher temperature. The temperature reported may not be accurate.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-139657-1
SDG: 410-139657

Client Sample ID: NBKK-B76-IDW01A-AQ-081723 — Lab Sample ID: 410-139657-1

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
1-Methylnaphthalene	0.025	J M Q *	0.050	0.040	0.020	ug/L	1		8270E SIM	Total/NA
2-Methylnaphthalene	0.029	J M Q *	0.050	0.040	0.020	ug/L	1		8270E SIM	Total/NA
Benzo[g,h,i]perylene	0.011	J M Q *	0.050	0.030	0.010	ug/L	1		8270E SIM	Total/NA
Fluoranthene	0.029	J Q *	0.050	0.030	0.010	ug/L	1		8270E SIM	Total/NA
C12-C24	3200	M Q *	110	97	48	ug/L	1		NWTPH-Dx	Total/NA
C24-C40	1400	M *	270	260	110	ug/L	1		NWTPH-Dx	Total/NA
Arsenic	0.014		0.0020	0.0017	0.00068	mg/L	1		6020B	Total Recoverable
Barium	0.16		0.0020	0.0016	0.00075	mg/L	1		6020B	Total Recoverable
Cadmium	0.062		0.00050	0.00040	0.00015	mg/L	1		6020B	Total Recoverable
Chromium	0.046		0.0020	0.0011	0.00055	mg/L	1		6020B	Total Recoverable
Copper	0.072		0.0010	0.00090	0.00036	mg/L	1		6020B	Total Recoverable
Lead	0.034		0.00050	0.00020	0.00012	mg/L	1		6020B	Total Recoverable
Nickel	0.053		0.0015	0.00080	0.00040	mg/L	1		6020B	Total Recoverable
Selenium	0.022		0.0010	0.00060	0.00028	mg/L	1		6020B	Total Recoverable
Silver	0.0012		0.00050	0.00030	0.00010	mg/L	1		6020B	Total Recoverable
Zinc	0.88		0.015	0.0080	0.0040	mg/L	1		6020B	Total Recoverable
Mercury	0.092	J	0.20	0.16	0.079	ug/L	1		7470A	Total/NA
Flashpoint	>201		50.0	50.0	50.0	Degrees F	1		1010A	Total/NA
pH	9.0	HF	0.01	0.01	0.01	S.U.	1		9040C	Total/NA
Corrosivity	No	HF	0.01	0.01	0.01	NONE	1		9040C	Total/NA

Client Sample ID: NBKK-B76-IDW02A-AQ-081723 — Lab Sample ID: 410-139657-2

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.0017	J	0.0020	0.0017	0.00068	mg/L	1		6020B	Total Recoverable
Barium	0.047		0.0020	0.0016	0.00075	mg/L	1		6020B	Total Recoverable
Copper	0.00036	J	0.0010	0.00090	0.00036	mg/L	1		6020B	Total Recoverable
Nickel	0.0032		0.0015	0.00080	0.00040	mg/L	1		6020B	Total Recoverable
Zinc	0.0068	J	0.015	0.0080	0.0040	mg/L	1		6020B	Total Recoverable
Flashpoint	>200		50.0	50.0	50.0	Degrees F	1		1010A	Total/NA
pH	7.4	HF	0.01	0.01	0.01	S.U.	1		9040C	Total/NA
Corrosivity	No	HF	0.01	0.01	0.01	NONE	1		9040C	Total/NA

Client Sample ID: NBKK-B76-IDW01A-SO-081723 — Lab Sample ID: 410-139657-3

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
1-Methylnaphthalene	0.0014	J B *	0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
2-Methylnaphthalene	0.0019	J B *	0.0037	0.0030	0.0015	mg/Kg	1	☼	8270E SIM	Total/NA
Benzo[a]anthracene	0.0017	J M	0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Benzo[a]pyrene	0.0023		0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Benzo[b]fluoranthene	0.0029	M	0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Lancaster Laboratories Environment Testing, LLC

Client Sample ID: NBKK-B76-IDW01A-SO-081723 (Continued) — Lab Sample ID: 410-139657-3

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Benzo[g,h,i]perylene	0.0020		0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Benzo[k]fluoranthene	0.00097	J M	0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Chrysene	0.0024	M	0.0019	0.0015	0.00037	mg/Kg	1	☼	8270E SIM	Total/NA
Fluoranthene	0.0036		0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Indeno[1,2,3-cd]pyrene	0.0016	J M	0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Naphthalene	0.0019	J	0.0037	0.0030	0.0015	mg/Kg	1	☼	8270E SIM	Total/NA
Phenanthrene	0.0031		0.0026	0.0022	0.0011	mg/Kg	1	☼	8270E SIM	Total/NA
Pyrene	0.0062		0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
1-Methylnaphthalene - RE	0.00091	J	0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Acenaphthene - RE	0.0011	J	0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Acenaphthylene - RE	0.00086	J	0.0019	0.0015	0.00037	mg/Kg	1	☼	8270E SIM	Total/NA
Anthracene - RE	0.0023		0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Benzo[a]anthracene - RE	0.0055	M	0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Benzo[a]pyrene - RE	0.0062		0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Benzo[b]fluoranthene - RE	0.0085		0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Benzo[g,h,i]perylene - RE	0.0054	M	0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Benzo[k]fluoranthene - RE	0.0038		0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Chrysene - RE	0.0074	M	0.0019	0.0015	0.00037	mg/Kg	1	☼	8270E SIM	Total/NA
Dibenz(a,h)anthracene - RE	0.0015	J M	0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Fluoranthene - RE	0.010		0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Fluorene - RE	0.0014	J	0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Indeno[1,2,3-cd]pyrene - RE	0.0051	M	0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
Phenanthrene - RE	0.0044		0.0026	0.0022	0.0011	mg/Kg	1	☼	8270E SIM	Total/NA
Pyrene - RE	0.0092		0.0019	0.0015	0.00075	mg/Kg	1	☼	8270E SIM	Total/NA
C7-C12 (1C)	0.27	J D Q *	5.5	0.55	0.25	mg/Kg	25	☼	NWTPH-Gx	Total/NA
C12-C24	15	M J1	11	9.1	4.5	mg/Kg	1	☼	NWTPH-Dx	Total/NA
C24-C40	52	M	34	23	11	mg/Kg	1	☼	NWTPH-Dx	Total/NA
Arsenic	3.9	D	0.40	0.32	0.13	mg/Kg	2	☼	6020B	Total/NA
Barium	77	D	0.40	0.36	0.18	mg/Kg	2	☼	6020B	Total/NA
Cadmium	0.16	D	0.10	0.080	0.040	mg/Kg	2	☼	6020B	Total/NA
Chromium	26	D	0.40	0.38	0.19	mg/Kg	2	☼	6020B	Total/NA
Copper	14	D	0.40	0.36	0.18	mg/Kg	2	☼	6020B	Total/NA
Lead	36	D	0.20	0.16	0.076	mg/Kg	2	☼	6020B	Total/NA
Nickel	36	D	0.40	0.38	0.19	mg/Kg	2	☼	6020B	Total/NA
Selenium	0.11	J D	0.40	0.20	0.10	mg/Kg	2	☼	6020B	Total/NA
Zinc	50	D	30	8.0	4.0	mg/Kg	2	☼	6020B	Total/NA
Barium	370	B *	20	16	7.5	ug/L	1		6020B	TCLP
Lead	19	*	5.0	2.0	1.2	ug/L	1		6020B	TCLP
Mercury	0.034	J	0.065	0.043	0.022	mg/Kg	1	☼	7471B	Total/NA
Flashpoint	>201	*	50.0	50.0	50.0	Degrees F	1		1010A	Total/NA

Client Sample ID: NBKK-B76-IDW02A-SO-081723 — Lab Sample ID: 410-139657-4

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
2-Butanone	27	J D	200	20	10	ug/L	20		8260D	TCLP
Chrysene	0.0024	J M	0.012	0.0096	0.0024	mg/Kg	1	☼	8270E SIM	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: NBKK-B76-IDW02A-SO-081723 (Continued) — Lab Sample ID: 410-139657-4

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
C12-C24	16	M	13	10	5.2	mg/Kg	1	☼	NWTPH-Dx	Total/NA
C24-C40	18	J M	39	26	13	mg/Kg	1	☼	NWTPH-Dx	Total/NA
Arsenic	3.5	D	0.44	0.35	0.15	mg/Kg	2	☼	6020B	Total/NA
Barium	120	D	0.44	0.40	0.20	mg/Kg	2	☼	6020B	Total/NA
Cadmium	0.42	D	0.11	0.088	0.044	mg/Kg	2	☼	6020B	Total/NA
Chromium	32	D	0.44	0.42	0.21	mg/Kg	2	☼	6020B	Total/NA
Copper	17	D	0.44	0.40	0.20	mg/Kg	2	☼	6020B	Total/NA
Lead	9.7	D	0.22	0.18	0.084	mg/Kg	2	☼	6020B	Total/NA
Nickel	43	D	0.44	0.42	0.21	mg/Kg	2	☼	6020B	Total/NA
Selenium	0.94	D	0.44	0.22	0.11	mg/Kg	2	☼	6020B	Total/NA
Silver	0.082	J D	0.11	0.088	0.045	mg/Kg	2	☼	6020B	Total/NA
Zinc	43	D	33	8.8	4.4	mg/Kg	2	☼	6020B	Total/NA
Barium	510	B *	20	16	7.5	ug/L	1		6020B	TCLP
Cadmium	2.4	J *	5.0	4.0	1.5	ug/L	1		6020B	TCLP
Lead	6.0	*	5.0	2.0	1.2	ug/L	1		6020B	TCLP
Mercury	0.035	J	0.079	0.053	0.026	mg/Kg	1	☼	7471B	Total/NA
Flashpoint	>201	*	50.0	50.0	50.0	Degrees F	1		1010A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: NBKK-B76-IDW01A-AQ-081723
Date Collected: 08/17/23 16:47
Date Received: 08/19/23 09:50

Lab Sample ID: 410-139657-1
Matrix: Water

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	**0.025**	**J M Q ***	0.050	0.040	0.020	ug/L		08/24/23 09:23	1
2-Methylnaphthalene	**0.029**	**J M Q ***	0.050	0.040	0.020	ug/L		08/24/23 09:23	1
Acenaphthene	0.030	U M Q *	0.050	0.030	0.010	ug/L		08/24/23 09:23	1
Acenaphthylene	0.030	U M Q *	0.050	0.030	0.010	ug/L		08/24/23 09:23	1
Anthracene	0.030	U Q *	0.050	0.030	0.010	ug/L		08/24/23 09:23	1
Benzo[a]anthracene	0.030	U *	0.050	0.030	0.010	ug/L		08/24/23 09:23	1
Benzo[a]pyrene	0.030	U M Q *	0.050	0.030	0.010	ug/L		08/24/23 09:23	1
Benzo[b]fluoranthene	0.030	U M Q *	0.050	0.030	0.010	ug/L		08/24/23 09:23	1
Benzo[g,h,i]perylene	**0.011**	**J M Q ***	0.050	0.030	0.010	ug/L		08/24/23 09:23	1
Benzo[k]fluoranthene	0.030	U Q *	0.050	0.030	0.010	ug/L		08/24/23 09:23	1
Chrysene	0.030	U *	0.050	0.030	0.010	ug/L		08/24/23 09:23	1
Dibenz(a,h)anthracene	0.040	U Q *	0.050	0.040	0.020	ug/L		08/24/23 09:23	1
Fluoranthene	**0.029**	**J Q ***	0.050	0.030	0.010	ug/L		08/24/23 09:23	1
Fluorene	0.030	U M Q *	0.050	0.030	0.010	ug/L		08/24/23 09:23	1
Indeno[1,2,3-cd]pyrene	0.040	U M Q *	0.050	0.040	0.020	ug/L		08/24/23 09:23	1
Naphthalene	0.060	U Q *	0.070	0.060	0.030	ug/L		08/24/23 09:23	1
Phenanthrene	0.060	U M Q *	0.070	0.060	0.030	ug/L		08/24/23 09:23	1
Pyrene	0.030	U M *	0.050	0.030	0.010	ug/L		08/24/23 09:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*59*	*Q **	*17 - 120*	*08/23/23 07:52*	*08/24/23 09:23*	*1*
Fluoranthene-d10 (Surr)	*89*	*Q **	*43 - 124*	*08/23/23 07:52*	*08/24/23 09:23*	*1*
1-Methylnaphthalene-d10 (Surr)	*127*	*Q **	*33 - 120*	*08/23/23 07:52*	*08/24/23 09:23*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	85	U M	250	85	43	ug/L		08/23/23 05:09	1
C7-C12 (1C)	85	U M *	250	85	43	ug/L		08/24/23 07:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*0.2*	*Q*	*50 - 150*		*08/23/23 05:09*	*1*
a,a,a-Trifluorotoluene (fid) (1C)	*0.4*	*Q **	*50 - 150*		*08/24/23 07:50*	*1*

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016 (2C)	0.20	U M	0.25	0.20	0.10	ug/L		08/31/23 14:17	1
PCB-1221 (2C)	0.20	U M	0.25	0.20	0.10	ug/L		08/31/23 14:17	1
PCB-1232 (2C)	0.20	U M	0.25	0.20	0.10	ug/L		08/31/23 14:17	1
PCB-1242 (2C)	0.20	U M	0.25	0.20	0.10	ug/L		08/31/23 14:17	1
PCB-1248 (2C)	0.20	U M	0.25	0.20	0.10	ug/L		08/31/23 14:17	1
PCB-1254 (2C)	0.20	U M	0.25	0.20	0.078	ug/L		08/31/23 14:17	1
PCB-1260 (2C)	0.20	U M	0.25	0.20	0.078	ug/L		08/31/23 14:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr) (1C)	*82*	*Q **	*10 - 148*	*08/30/23 07:53*	*08/31/23 14:17*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*78*	***	*10 - 148*	*08/30/23 07:53*	*08/31/23 14:17*	*1*
Tetrachloro-m-xylene (1C)	*68*		*33 - 137*	*08/30/23 07:53*	*08/31/23 14:17*	*1*
Tetrachloro-m-xylene (2C)	*56*		*33 - 137*	*08/30/23 07:53*	*08/31/23 14:17*	*1*

Client Sample ID: NBKK-B76-IDW01A-AQ-081723

Lab Sample ID: 410-139657-1

Date Collected: 08/17/23 16:47

Matrix: Water

Date Received: 08/19/23 09:50

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C12-C24	3200	M Q *	110	97	48	ug/L		09/05/23 15:49	1
C24-C40	1400	M *	270	260	110	ug/L		09/05/23 15:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*8*	*Q **	*50 - 150*	*08/31/23 15:24*	*09/05/23 15:49*	*1*

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	0.014		0.0020	0.0017	0.00068	mg/L		08/28/23 20:25	1
Barium	0.16		0.0020	0.0016	0.00075	mg/L		08/30/23 08:36	1
Cadmium	0.062		0.00050	0.00040	0.00015	mg/L		08/28/23 20:25	1
Chromium	0.046		0.0020	0.0011	0.00055	mg/L		08/28/23 20:25	1
Copper	0.072		0.0010	0.00090	0.00036	mg/L		08/28/23 20:25	1
Lead	0.034		0.00050	0.00020	0.00012	mg/L		08/28/23 20:25	1
Nickel	0.053		0.0015	0.00080	0.00040	mg/L		08/30/23 08:36	1
Selenium	0.022		0.0010	0.00060	0.00028	mg/L		08/28/23 20:25	1
Silver	0.0012		0.00050	0.00030	0.00010	mg/L		08/28/23 20:25	1
Zinc	0.88		0.015	0.0080	0.0040	mg/L		08/28/23 20:25	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.092	J	0.20	0.16	0.079	ug/L		08/25/23 10:40	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Flashpoint (SW846 1010A)	>201		50.0	50.0	50.0	Degrees F		08/30/23 07:33	1
Cyanide, Reactive (SW846 9012)	49	U	59	49	20	mg/Kg		09/01/23 17:53	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	53	mg/Kg		08/31/23 12:50	1
pH (SW846 9040C)	9.0	HF	0.01	0.01	0.01	S.U.		08/24/23 22:55	1
Corrosivity (SW846 9040C)	No	HF	0.01	0.01	0.01	NONE		08/24/23 22:55	1

Client Sample ID: NBKK-B76-IDW02A-AQ-081723

Lab Sample ID: 410-139657-2

Date Collected: 08/17/23 17:02

Matrix: Water

Date Received: 08/19/23 09:50

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	0.040	U Q *	0.050	0.040	0.020	ug/L		08/24/23 09:44	1
2-Methylnaphthalene	0.040	U M Q *	0.050	0.040	0.020	ug/L		08/24/23 09:44	1
Acenaphthene	0.030	U M Q *	0.050	0.030	0.010	ug/L		08/24/23 09:44	1
Acenaphthylene	0.030	U Q *	0.050	0.030	0.010	ug/L		08/24/23 09:44	1
Anthracene	0.030	U M Q *	0.050	0.030	0.010	ug/L		08/24/23 09:44	1
Benzo[a]anthracene	0.030	U *	0.050	0.030	0.010	ug/L		08/24/23 09:44	1
Benzo[a]pyrene	0.030	U M Q *	0.050	0.030	0.010	ug/L		08/24/23 09:44	1
Benzo[b]fluoranthene	0.030	U Q *	0.050	0.030	0.010	ug/L		08/24/23 09:44	1
Benzo[g,h,i]perylene	0.030	U Q *	0.050	0.030	0.010	ug/L		08/24/23 09:44	1
Benzo[k]fluoranthene	0.030	U Q *	0.050	0.030	0.010	ug/L		08/24/23 09:44	1
Chrysene	0.030	U *	0.050	0.030	0.010	ug/L		08/24/23 09:44	1
Dibenz(a,h)anthracene	0.040	U Q *	0.050	0.040	0.020	ug/L		08/24/23 09:44	1
Fluoranthene	0.030	U Q *	0.050	0.030	0.010	ug/L		08/24/23 09:44	1
Fluorene	0.030	U Q *	0.050	0.030	0.010	ug/L		08/24/23 09:44	1

Client Sample ID: NBKK-B76-IDW02A-AQ-081723

Date Collected: 08/17/23 17:02
Date Received: 08/19/23 09:50

Lab Sample ID: 410-139657-2

Matrix: Water

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Indeno[1,2,3-cd]pyrene	0.040	U Q *	0.050	0.040	0.020	ug/L		08/24/23 09:44	1
Naphthalene	0.060	U M Q *	0.070	0.060	0.030	ug/L		08/24/23 09:44	1
Phenanthrene	0.060	U Q *	0.070	0.060	0.030	ug/L		08/24/23 09:44	1
Pyrene	0.030	U M *	0.050	0.030	0.010	ug/L		08/24/23 09:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*51*	*Q * *	*17 - 120*	*08/23/23 07:52*	*08/24/23 09:44*	*1*
Fluoranthene-d10 (Surr)	*97*	*Q * *	*43 - 124*	*08/23/23 07:52*	*08/24/23 09:44*	*1*
1-Methylnaphthalene-d10 (Surr)	*103*	*Q * *	*33 - 120*	*08/23/23 07:52*	*08/24/23 09:44*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	85	U M	250	85	43	ug/L		08/23/23 05:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*99*		*50 - 150*		*08/23/23 05:35*	*1*

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016 (2C)	0.20	U	0.25	0.20	0.10	ug/L		08/31/23 14:28	1
PCB-1221 (2C)	0.20	U	0.25	0.20	0.10	ug/L		08/31/23 14:28	1
PCB-1232 (2C)	0.20	U	0.25	0.20	0.10	ug/L		08/31/23 14:28	1
PCB-1242 (2C)	0.20	U	0.25	0.20	0.10	ug/L		08/31/23 14:28	1
PCB-1248 (2C)	0.20	U	0.25	0.20	0.10	ug/L		08/31/23 14:28	1
PCB-1254 (2C)	0.20	U	0.25	0.20	0.078	ug/L		08/31/23 14:28	1
PCB-1260 (2C)	0.20	U M	0.25	0.20	0.078	ug/L		08/31/23 14:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr) (1C)	*55*	*Q * *	*10 - 148*	*08/30/23 07:53*	*08/31/23 14:28*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*49*	***	*10 - 148*	*08/30/23 07:53*	*08/31/23 14:28*	*1*
Tetrachloro-m-xylene (1C)	*77*		*33 - 137*	*08/30/23 07:53*	*08/31/23 14:28*	*1*
Tetrachloro-m-xylene (2C)	*65*		*33 - 137*	*08/30/23 07:53*	*08/31/23 14:28*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C12-C24	95	U M Q *	110	95	47	ug/L		09/05/23 15:27	1
C24-C40	250	U M *	260	250	110	ug/L		09/05/23 15:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*71*	***	*50 - 150*	*08/31/23 15:24*	*09/05/23 15:27*	*1*

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**0.0017**	**J**	0.0020	0.0017	0.00068	mg/L		08/28/23 20:23	1
Barium	**0.047**		0.0020	0.0016	0.00075	mg/L		08/30/23 08:34	1
Cadmium	0.00040	U	0.00050	0.00040	0.00015	mg/L		08/28/23 20:23	1
Chromium	0.0011	U	0.0020	0.0011	0.00055	mg/L		08/28/23 20:23	1
Copper	**0.00036**	**J**	0.0010	0.00090	0.00036	mg/L		08/28/23 20:23	1
Lead	0.00020	U	0.00050	0.00020	0.00012	mg/L		08/28/23 20:23	1
Nickel	**0.0032**		0.0015	0.00080	0.00040	mg/L		08/30/23 08:34	1
Selenium	0.00060	U	0.0010	0.00060	0.00028	mg/L		08/28/23 20:23	1

Client Sample ID: NBKK-B76-IDW02A-AQ-081723

Lab Sample ID: 410-139657-2
Date Collected: 08/17/23 17:02
Matrix: Water
Date Received: 08/19/23 09:50

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Silver	0.00030	U	0.00050	0.00030	0.00010	mg/L		08/28/23 20:23	1
Zinc	**0.0068**	**J**	0.015	0.0080	0.0040	mg/L		08/28/23 20:23	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.16	U	0.20	0.16	0.079	ug/L		08/25/23 10:42	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Flashpoint (SW846 1010A)	**>200**		50.0	50.0	50.0	Degrees F		08/30/23 07:33	1
Cyanide, Reactive (SW846 9012)	49	U	59	49	20	mg/Kg		09/01/23 17:40	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	53	mg/Kg		08/31/23 12:50	1
pH (SW846 9040C)	**7.4**	**HF**	0.01	0.01	0.01	S.U.		08/24/23 22:55	1
Corrosivity (SW846 9040C)	**No**	**HF**	0.01	0.01	0.01	NONE		08/24/23 22:55	1

Client Sample ID: NBKK-B76-IDW01A-SO-081723

Lab Sample ID: 410-139657-3
Date Collected: 08/17/23 17:10
Matrix: Solid
Date Received: 08/19/23 09:50
Percent Solids: 87.9

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	12	U	20	12	6.0	ug/L		09/15/23 07:38	20
Carbon tetrachloride	12	U	20	12	6.0	ug/L		09/15/23 07:38	20
Chlorobenzene	12	U	20	12	6.0	ug/L		09/15/23 07:38	20
Chloroform	12	U	20	12	6.0	ug/L		09/15/23 07:38	20
1,2-Dichloroethane	12	U Q *	20	12	6.0	ug/L		09/15/23 07:38	20
1,1-Dichloroethene	12	U	20	12	6.0	ug/L		09/15/23 07:38	20
2-Butanone	20	U M	200	20	10	ug/L		09/15/23 07:38	20
Tetrachloroethene	12	U	20	12	6.0	ug/L		09/15/23 07:38	20
Trichloroethene	12	U	20	12	6.0	ug/L		09/15/23 07:38	20
Vinyl chloride	12	U	20	12	6.0	ug/L		09/15/23 07:38	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*81 - 118*		*09/15/23 07:38*	*20*
4-Bromofluorobenzene (Surr)	*99*		*85 - 114*		*09/15/23 07:38*	*20*
Dibromofluoromethane (Surr)	*90*		*80 - 119*		*09/15/23 07:38*	*20*
Toluene-d8 (Surr)	*102*		*89 - 112*		*09/15/23 07:38*	*20*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	**0.0014**	**J B ***	0.0019	0.0015	0.00075	mg/Kg	☼	09/01/23 07:05	1
2-Methylnaphthalene	**0.0019**	**J B ***	0.0037	0.0030	0.0015	mg/Kg	☼	09/01/23 07:05	1
Acenaphthene	0.0015	U	0.0019	0.0015	0.00075	mg/Kg	☼	09/01/23 07:05	1
Acenaphthylene	0.0015	U M	0.0019	0.0015	0.00037	mg/Kg	☼	09/01/23 07:05	1
Anthracene	0.0015	U	0.0019	0.0015	0.00075	mg/Kg	☼	09/01/23 07:05	1
Benzo[a]anthracene	**0.0017**	**J M**	0.0019	0.0015	0.00075	mg/Kg	☼	09/01/23 07:05	1
Benzo[a]pyrene	**0.0023**		0.0019	0.0015	0.00075	mg/Kg	☼	09/01/23 07:05	1
Benzo[b]fluoranthene	**0.0029**	**M**	0.0019	0.0015	0.00075	mg/Kg	☼	09/01/23 07:05	1
Benzo[g,h,i]perylene	**0.0020**		0.0019	0.0015	0.00075	mg/Kg	☼	09/01/23 07:05	1
Benzo[k]fluoranthene	**0.00097**	**J M**	0.0019	0.0015	0.00075	mg/Kg	☼	09/01/23 07:05	1
Chrysene	**0.0024**	**M**	0.0019	0.0015	0.00037	mg/Kg	☼	09/01/23 07:05	1

Client Sample ID: NBKK-B76-IDW01A-SO-081723

Date Collected: 08/17/23 17:10
Date Received: 08/19/23 09:50

Lab Sample ID: 410-139657-3

Matrix: Solid
Percent Solids: 87.9

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Dibenz(a,h)anthracene	0.0015	U M	0.0019	0.0015	0.00075	mg/Kg	☼	09/01/23 07:05	1
Fluoranthene	**0.0036**		0.0019	0.0015	0.00075	mg/Kg	☼	09/01/23 07:05	1
Fluorene	0.0015	U	0.0019	0.0015	0.00075	mg/Kg	☼	09/01/23 07:05	1
Indeno[1,2,3-cd]pyrene	**0.0016**	**J M**	0.0019	0.0015	0.00075	mg/Kg	☼	09/01/23 07:05	1
Naphthalene	**0.0019**	**J**	0.0037	0.0030	0.0015	mg/Kg	☼	09/01/23 07:05	1
Phenanthrene	**0.0031**		0.0026	0.0022	0.0011	mg/Kg	☼	09/01/23 07:05	1
Pyrene	**0.0062**		0.0019	0.0015	0.00075	mg/Kg	☼	09/01/23 07:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*67*		*34 - 130*	*08/31/23 16:25*	*09/01/23 07:05*	*1*
Fluoranthene-d10 (Surr)	*71*		*30 - 135*	*08/31/23 16:25*	*09/01/23 07:05*	*1*
1-Methylnaphthalene-d10 (Surr)	*61*		*37 - 120*	*08/31/23 16:25*	*09/01/23 07:05*	*1*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	**0.00091**	**J**	0.0019	0.0015	0.00075	mg/Kg	☼	08/30/23 11:29	1
2-Methylnaphthalene	0.0030	U	0.0037	0.0030	0.0015	mg/Kg	☼	08/30/23 11:29	1
Acenaphthene	**0.0011**	**J**	0.0019	0.0015	0.00075	mg/Kg	☼	08/30/23 11:29	1
Acenaphthylene	**0.00086**	**J**	0.0019	0.0015	0.00037	mg/Kg	☼	08/30/23 11:29	1
Anthracene	**0.0023**		0.0019	0.0015	0.00075	mg/Kg	☼	08/30/23 11:29	1
Benzo[a]anthracene	**0.0055**	**M**	0.0019	0.0015	0.00075	mg/Kg	☼	08/30/23 11:29	1
Benzo[a]pyrene	**0.0062**		0.0019	0.0015	0.00075	mg/Kg	☼	08/30/23 11:29	1
Benzo[b]fluoranthene	**0.0085**		0.0019	0.0015	0.00075	mg/Kg	☼	08/30/23 11:29	1
Benzo[g,h,i]perylene	**0.0054**	**M**	0.0019	0.0015	0.00075	mg/Kg	☼	08/30/23 11:29	1
Benzo[k]fluoranthene	**0.0038**		0.0019	0.0015	0.00075	mg/Kg	☼	08/30/23 11:29	1
Chrysene	**0.0074**	**M**	0.0019	0.0015	0.00037	mg/Kg	☼	08/30/23 11:29	1
Dibenz(a,h)anthracene	**0.0015**	**J M**	0.0019	0.0015	0.00075	mg/Kg	☼	08/30/23 11:29	1
Fluoranthene	**0.010**		0.0019	0.0015	0.00075	mg/Kg	☼	08/30/23 11:29	1
Fluorene	**0.0014**	**J**	0.0019	0.0015	0.00075	mg/Kg	☼	08/30/23 11:29	1
Indeno[1,2,3-cd]pyrene	**0.0051**	**M**	0.0019	0.0015	0.00075	mg/Kg	☼	08/30/23 11:29	1
Naphthalene	0.0030	U	0.0037	0.0030	0.0015	mg/Kg	☼	08/30/23 11:29	1
Phenanthrene	**0.0044**		0.0026	0.0022	0.0011	mg/Kg	☼	08/30/23 11:29	1
Pyrene	**0.0092**		0.0019	0.0015	0.00075	mg/Kg	☼	08/30/23 11:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*54*		*34 - 130*	*08/28/23 09:11*	*08/30/23 11:29*	*1*
Fluoranthene-d10 (Surr)	*47*		*30 - 135*	*08/28/23 09:11*	*08/30/23 11:29*	*1*
1-Methylnaphthalene-d10 (Surr)	*28*	*Q*	*37 - 120*	*08/28/23 09:11*	*08/30/23 11:29*	*1*

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0050	U	0.010	0.0050	0.0025	mg/L		09/06/23 01:31	1
2,4,5-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		09/06/23 01:31	1
2,4,6-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		09/06/23 01:31	1
2,4-Dinitrotoluene	0.010	U	0.025	0.010	0.0050	mg/L		09/06/23 01:31	1
2-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		09/06/23 01:31	1
4-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		09/06/23 01:31	1
Hexachlorobenzene	0.0011	U	0.0025	0.0011	0.00055	mg/L		09/06/23 01:31	1
Hexachlorobutadiene	0.0050	U	0.010	0.0050	0.0025	mg/L		09/06/23 01:31	1
Hexachloroethane	0.0050	U	0.025	0.0050	0.0025	mg/L		09/06/23 01:31	1

Client Sample ID: NBKK-B76-IDW01A-SO-081723

Date Collected: 08/17/23 17:10
Date Received: 08/19/23 09:50

Lab Sample ID: 410-139657-3

Matrix: Solid
Percent Solids: 87.9

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Nitrobenzene	0.0050	U M	0.010	0.0050	0.0025	mg/L		09/06/23 01:31	1
Pentachlorophenol	0.020	U M	0.025	0.020	0.0050	mg/L		09/06/23 01:31	1
Pyridine	0.020	U	0.025	0.020	0.010	mg/L		09/06/23 01:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*76*		*43 - 140*	*09/05/23 08:38*	*09/06/23 01:31*	*1*
2-Fluorobiphenyl (Surr)	*68*		*44 - 119*	*09/05/23 08:38*	*09/06/23 01:31*	*1*
2-Fluorophenol (Surr)	*45*		*19 - 119*	*09/05/23 08:38*	*09/06/23 01:31*	*1*
Nitrobenzene-d5 (Surr)	*69*		*44 - 120*	*09/05/23 08:38*	*09/06/23 01:31*	*1*
p-Terphenyl-d14 (Surr)	*87*		*50 - 134*	*09/05/23 08:38*	*09/06/23 01:31*	*1*
Phenol-d5 (Surr)	*33*		*10 - 120*	*09/05/23 08:38*	*09/06/23 01:31*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	**0.27**	**J D Q ***	5.5	0.55	0.25	mg/Kg	☼	08/22/23 18:28	25
C7-C12 (1C)	4.4	U *	44	4.4	2.0	mg/Kg	☼	08/24/23 17:06	200

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*90*	*	*50 - 150*	*08/21/23 20:27*	*08/22/23 18:28*	*25*
a,a,a-Trifluorotoluene (fid) (1C)	*59*	*	*50 - 150*	*08/21/23 20:27*	*08/24/23 17:06*	*200*

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016 (2C)	0.011	U M	0.019	0.011	0.0060	mg/Kg	☼	08/31/23 11:56	1
PCB-1221 (2C)	0.011	U	0.019	0.011	0.0060	mg/Kg	☼	08/31/23 11:56	1
PCB-1232 (2C)	0.011	U M	0.019	0.011	0.0060	mg/Kg	☼	08/31/23 11:56	1
PCB-1242 (2C)	0.011	U M	0.019	0.011	0.0060	mg/Kg	☼	08/31/23 11:56	1
PCB-1248 (2C)	0.011	U M	0.019	0.011	0.0060	mg/Kg	☼	08/31/23 11:56	1
PCB-1254 (2C)	0.011	U M	0.019	0.011	0.0073	mg/Kg	☼	08/31/23 11:56	1
PCB-1260 (2C)	0.011	U M	0.019	0.011	0.0073	mg/Kg	☼	08/31/23 11:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (1C)	*127*	*J1*	*44 - 130*	*08/25/23 09:07*	*08/31/23 11:56*	*1*
Tetrachloro-m-xylene (2C)	*81*	*J1*	*44 - 130*	*08/25/23 09:07*	*08/31/23 11:56*	*1*
DCB Decachlorobiphenyl (Surr) (1C)	*104*	*Q **	*66 - 130*	*08/25/23 09:07*	*08/31/23 11:56*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*97*	*	*66 - 130*	*08/25/23 09:07*	*08/31/23 11:56*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C12-C24	**15**	**M J1**	11	9.1	4.5	mg/Kg	☼	08/26/23 03:33	1
C24-C40	**52**	**M**	34	23	11	mg/Kg	☼	08/26/23 03:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*112*		*50 - 150*	*08/23/23 03:10*	*08/26/23 03:33*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**3.9**	**D**	0.40	0.32	0.13	mg/Kg	☼	08/31/23 11:01	2
Barium	**77**	**D**	0.40	0.36	0.18	mg/Kg	☼	09/09/23 12:23	2
Cadmium	**0.16**	**D**	0.10	0.080	0.040	mg/Kg	☼	08/31/23 11:01	2
Chromium	**26**	**D**	0.40	0.38	0.19	mg/Kg	☼	08/31/23 11:01	2

Client Sample ID: NBKK-B76-IDW01A-SO-081723

Lab Sample ID: 410-139657-3
Date Collected: 08/17/23 17:10
Matrix: Solid
Date Received: 08/19/23 09:50
Percent Solids: 87.9

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Copper	**14**	**D**	0.40	0.36	0.18	mg/Kg	☼	08/31/23 11:01	2
Lead	**36**	**D**	0.20	0.16	0.076	mg/Kg	☼	08/31/23 11:01	2
Nickel	**36**	**D**	0.40	0.38	0.19	mg/Kg	☼	08/31/23 11:01	2
Selenium	**0.11**	**J D**	0.40	0.20	0.10	mg/Kg	☼	08/31/23 11:01	2
Silver	0.080	U	0.10	0.080	0.041	mg/Kg	☼	08/31/23 11:01	2
Zinc	**50**	**D**	30	8.0	4.0	mg/Kg	☼	08/31/23 11:01	2

Method: SW846 6020B - Metals (ICP/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	17	U *	20	17	6.8	ug/L		09/05/23 17:32	1
Barium	**370**	**B ***	20	16	7.5	ug/L		09/05/23 17:32	1
Cadmium	4.0	U *	5.0	4.0	1.5	ug/L		09/05/23 17:32	1
Chromium	11	U *	20	11	5.5	ug/L		09/05/23 17:32	1
Lead	**19**	****	5.0	2.0	1.2	ug/L		09/05/23 17:32	1
Selenium	6.0	U *	10	6.0	2.8	ug/L		09/05/23 17:32	1
Silver	3.0	U *	5.0	3.0	1.0	ug/L		09/05/23 17:32	1

Method: SW846 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.16	U	0.20	0.16	0.079	ug/L		09/01/23 15:35	1

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	**0.034**	**J**	0.065	0.043	0.022	mg/Kg	☼	08/21/23 09:22	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Flashpoint (SW846 1010A)	**>201**	****	50.0	50.0	50.0	Degrees F		08/30/23 07:33	1
Cyanide, Reactive (SW846 9012)	48	U	58	48	19	mg/Kg		09/01/23 17:54	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	52	mg/Kg		08/31/23 12:50	1
Percent Moisture (EPA Moisture)	**12.1**		1.0		1.0	%		08/19/23 14:38	1
Percent Solids (EPA Moisture)	**87.9**		1.0		1.0	%		08/19/23 14:38	1

Client Sample ID: NBKK-B76-IDW02A-SO-081723

Lab Sample ID: 410-139657-4
Date Collected: 08/17/23 17:13
Matrix: Solid
Date Received: 08/19/23 09:50
Percent Solids: 76.0

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	12	U	20	12	6.0	ug/L		09/15/23 08:22	20
Carbon tetrachloride	12	U	20	12	6.0	ug/L		09/15/23 08:22	20
Chlorobenzene	12	U	20	12	6.0	ug/L		09/15/23 08:22	20
Chloroform	12	U	20	12	6.0	ug/L		09/15/23 08:22	20
1,2-Dichloroethane	12	U Q *	20	12	6.0	ug/L		09/15/23 08:22	20
1,1-Dichloroethene	12	U	20	12	6.0	ug/L		09/15/23 08:22	20
2-Butanone	**27**	**J D**	200	20	10	ug/L		09/15/23 08:22	20
Tetrachloroethene	12	U	20	12	6.0	ug/L		09/15/23 08:22	20
Trichloroethene	12	U	20	12	6.0	ug/L		09/15/23 08:22	20
Vinyl chloride	12	U	20	12	6.0	ug/L		09/15/23 08:22	20

Client Sample ID: NBKK-B76-IDW02A-SO-081723

Date Collected: 08/17/23 17:13
Date Received: 08/19/23 09:50

Lab Sample ID: 410-139657-4

Matrix: Solid
Percent Solids: 76.0

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		81 - 118		09/15/23 08:22	20
4-Bromofluorobenzene (Surr)	98		85 - 114		09/15/23 08:22	20
Dibromofluoromethane (Surr)	91		80 - 119		09/15/23 08:22	20
Toluene-d8 (Surr)	103		89 - 112		09/15/23 08:22	20

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	0.0096	U	0.012	0.0096	0.0048	mg/Kg	☼	08/30/23 11:53	1
2-Methylnaphthalene	0.019	U	0.024	0.019	0.0096	mg/Kg	☼	08/30/23 11:53	1
Acenaphthene	0.0096	U	0.012	0.0096	0.0048	mg/Kg	☼	08/30/23 11:53	1
Acenaphthylene	0.0096	U	0.012	0.0096	0.0024	mg/Kg	☼	08/30/23 11:53	1
Anthracene	0.0096	U	0.012	0.0096	0.0048	mg/Kg	☼	08/30/23 11:53	1
Benzo[a]anthracene	0.0096	U M	0.012	0.0096	0.0048	mg/Kg	☼	08/30/23 11:53	1
Benzo[a]pyrene	0.0096	U	0.012	0.0096	0.0048	mg/Kg	☼	08/30/23 11:53	1
Benzo[b]fluoranthene	0.0096	U	0.012	0.0096	0.0048	mg/Kg	☼	08/30/23 11:53	1
Benzo[g,h,i]perylene	0.0096	U	0.012	0.0096	0.0048	mg/Kg	☼	08/30/23 11:53	1
Benzo[k]fluoranthene	0.0096	U	0.012	0.0096	0.0048	mg/Kg	☼	08/30/23 11:53	1
Chrysene	**0.0024**	**J M**	0.012	0.0096	0.0024	mg/Kg	☼	08/30/23 11:53	1
Dibenz(a,h)anthracene	0.0096	U	0.012	0.0096	0.0048	mg/Kg	☼	08/30/23 11:53	1
Fluoranthene	0.0096	U	0.012	0.0096	0.0048	mg/Kg	☼	08/30/23 11:53	1
Fluorene	0.0096	U	0.012	0.0096	0.0048	mg/Kg	☼	08/30/23 11:53	1
Indeno[1,2,3-cd]pyrene	0.0096	U	0.012	0.0096	0.0048	mg/Kg	☼	08/30/23 11:53	1
Naphthalene	0.019	U	0.024	0.019	0.0096	mg/Kg	☼	08/30/23 11:53	1
Phenanthrene	0.014	U	0.017	0.014	0.0072	mg/Kg	☼	08/30/23 11:53	1
Pyrene	0.0096	U	0.012	0.0096	0.0048	mg/Kg	☼	08/30/23 11:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(a)pyrene-d12 (Surr)	72		34 - 130	08/28/23 09:11	08/30/23 11:53	1
Fluoranthene-d10 (Surr)	77		30 - 135	08/28/23 09:11	08/30/23 11:53	1
1-Methylnaphthalene-d10 (Surr)	68		37 - 120	08/28/23 09:11	08/30/23 11:53	1

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0050	U	0.010	0.0050	0.0025	mg/L		09/02/23 01:57	1
2,4,5-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		09/02/23 01:57	1
2,4,6-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		09/02/23 01:57	1
2,4-Dinitrotoluene	0.010	U	0.025	0.010	0.0050	mg/L		09/02/23 01:57	1
2-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		09/02/23 01:57	1
4-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		09/02/23 01:57	1
Hexachlorobenzene	0.0011	U	0.0025	0.0011	0.00055	mg/L		09/02/23 01:57	1
Hexachlorobutadiene	0.0050	U	0.010	0.0050	0.0025	mg/L		09/02/23 01:57	1
Hexachloroethane	0.0050	U	0.025	0.0050	0.0025	mg/L		09/02/23 01:57	1
Nitrobenzene	0.0050	U	0.010	0.0050	0.0025	mg/L		09/02/23 01:57	1
Pentachlorophenol	0.020	U M Q *	0.025	0.020	0.0050	mg/L		09/02/23 01:57	1
Pyridine	0.020	U	0.025	0.020	0.010	mg/L		09/02/23 01:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	78		43 - 140	09/01/23 15:27	09/02/23 01:57	1
2-Fluorobiphenyl (Surr)	79		44 - 119	09/01/23 15:27	09/02/23 01:57	1
2-Fluorophenol (Surr)	36		19 - 119	09/01/23 15:27	09/02/23 01:57	1
Nitrobenzene-d5 (Surr)	65		44 - 120	09/01/23 15:27	09/02/23 01:57	1

Client Sample ID: NBKK-B76-IDW02A-SO-081723

Date Collected: 08/17/23 17:13
Date Received: 08/19/23 09:50

Lab Sample ID: 410-139657-4

Matrix: Solid
Percent Solids: 76.0

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
p-Terphenyl-d14 (Surr)	*63*		*50 - 134*	*09/01/23 15:27*	*09/02/23 01:57*	*1*
Phenol-d5 (Surr)	*24*		*10 - 120*	*09/01/23 15:27*	*09/02/23 01:57*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	28	U Q *	280	28	13	mg/Kg	☼	08/22/23 19:10	1000
C7-C12 (1C)	28	U *	280	28	13	mg/Kg	☼	08/24/23 17:42	1000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*74*	*	*50 - 150*	*08/21/23 20:27*	*08/22/23 19:10*	*1000*
a,a,a-Trifluorotoluene (fid) (1C)	*41*	*Q *	*50 - 150*	*08/21/23 20:27*	*08/24/23 17:42*	*1000*

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016 (2C)	0.074	U	0.13	0.074	0.039	mg/Kg	☼	08/31/23 12:07	1
PCB-1221 (2C)	0.074	U	0.13	0.074	0.039	mg/Kg	☼	08/31/23 12:07	1
PCB-1232 (2C)	0.074	U	0.13	0.074	0.039	mg/Kg	☼	08/31/23 12:07	1
PCB-1242 (2C)	0.074	U	0.13	0.074	0.039	mg/Kg	☼	08/31/23 12:07	1
PCB-1248 (2C)	0.074	U	0.13	0.074	0.039	mg/Kg	☼	08/31/23 12:07	1
PCB-1254 (2C)	0.074	U	0.13	0.074	0.047	mg/Kg	☼	08/31/23 12:07	1
PCB-1260 (2C)	0.074	U	0.13	0.074	0.047	mg/Kg	☼	08/31/23 12:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (1C)	*124*		*44 - 130*	*08/25/23 09:07*	*08/31/23 12:07*	*1*
Tetrachloro-m-xylene (2C)	*85*		*44 - 130*	*08/25/23 09:07*	*08/31/23 12:07*	*1*
DCB Decachlorobiphenyl (Surr) (1C)	*126*	*Q *	*66 - 130*	*08/25/23 09:07*	*08/31/23 12:07*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*99*	*	*66 - 130*	*08/25/23 09:07*	*08/31/23 12:07*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C12-C24	**16**	**M**	13	10	5.2	mg/Kg	☼	08/26/23 03:11	1
C24-C40	**18**	**J M**	39	26	13	mg/Kg	☼	08/26/23 03:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*117*		*50 - 150*	*08/23/23 03:10*	*08/26/23 03:11*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**3.5**	**D**	0.44	0.35	0.15	mg/Kg	☼	08/31/23 11:05	2
Barium	**120**	**D**	0.44	0.40	0.20	mg/Kg	☼	09/09/23 12:25	2
Cadmium	**0.42**	**D**	0.11	0.088	0.044	mg/Kg	☼	08/31/23 11:05	2
Chromium	**32**	**D**	0.44	0.42	0.21	mg/Kg	☼	08/31/23 11:05	2
Copper	**17**	**D**	0.44	0.40	0.20	mg/Kg	☼	08/31/23 11:05	2
Lead	**9.7**	**D**	0.22	0.18	0.084	mg/Kg	☼	08/31/23 11:05	2
Nickel	**43**	**D**	0.44	0.42	0.21	mg/Kg	☼	08/31/23 11:05	2
Selenium	**0.94**	**D**	0.44	0.22	0.11	mg/Kg	☼	08/31/23 11:05	2
Silver	**0.082**	**J D**	0.11	0.088	0.045	mg/Kg	☼	08/31/23 11:05	2
Zinc	**43**	**D**	33	8.8	4.4	mg/Kg	☼	08/31/23 11:05	2

Client Sample ID: NBKK-B76-IDW02A-SO-081723

Date Collected: 08/17/23 17:13
Date Received: 08/19/23 09:50

Lab Sample ID: 410-139657-4

Matrix: Solid
Percent Solids: 76.0

Method: SW846 6020B - Metals (ICP/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	17	U *	20	17	6.8	ug/L		09/05/23 17:58	1
Barium	**510**	**B ***	20	16	7.5	ug/L		09/05/23 17:58	1
Cadmium	**2.4**	**J ***	5.0	4.0	1.5	ug/L		09/05/23 17:58	1
Chromium	11	U *	20	11	5.5	ug/L		09/05/23 17:58	1
Lead	**6.0**	*****	5.0	2.0	1.2	ug/L		09/05/23 17:58	1
Selenium	6.0	U *	10	6.0	2.8	ug/L		09/05/23 17:58	1
Silver	3.0	U *	5.0	3.0	1.0	ug/L		09/05/23 17:58	1

Method: SW846 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.16	U	0.20	0.16	0.079	ug/L		09/05/23 09:30	1

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	**0.035**	**J**	0.079	0.053	0.026	mg/Kg	☼	08/21/23 09:24	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Flashpoint (SW846 1010A)	**>201**	*****	50.0	50.0	50.0	Degrees F		08/30/23 07:33	1
Cyanide, Reactive (SW846 9012)	48	U	58	48	19	mg/Kg		09/01/23 17:54	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	52	mg/Kg		08/31/23 12:50	1
Percent Moisture (EPA Moisture)	**24.0**		1.0		1.0	%		08/19/23 14:38	1
Percent Solids (EPA Moisture)	**76.0**		1.0		1.0	%		08/19/23 14:38	1

Surrogate Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-139657-1
SDG: 410-139657

Method: 8260D - Volatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(81-118)	(85-114)	(80-119)	(89-112)
LCS 410-419687/5	Lab Control Sample	100	97	89	102
MB 410-419687/9	Method Blank	99	99	89	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260D - Volatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(81-118)	(85-114)	(80-119)	(89-112)
410-139657-3	NBKK-B76-IDW01A-SO-081723	98	99	90	102
410-139657-3 MS	NBKK-B76-IDW01A-SO-081723	100	97	89	103
410-139657-4	NBKK-B76-IDW02A-SO-081723	102	98	91	103

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	TPHd14	PHL
Lab Sample ID	Client Sample ID	(43-140)	(44-119)	(19-119)	(44-120)	(50-134)	(10-120)
LCS 410-415416/2-A	Lab Control Sample	82	62	32	56	75	21
LCS 410-415859/2-A	Lab Control Sample	83	83	51	82	83	34
LCSD 410-415416/3-A	Lab Control Sample Dup	79	74	29	67	73	23
LCSD 410-415859/3-A	Lab Control Sample Dup	84	75	50	84	80	35
MB 410-415416/1-A	Method Blank	85	72	30	62	85	19
MB 410-415859/1-A	Method Blank	72	67	48	76	85	34

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
TPHd14 = p-Terphenyl-d14 (Surr)
PHL = Phenol-d5 (Surr)

Surrogate Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-139657-1
SDG: 410-139657

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	TPHd14	PHL
Lab Sample ID	Client Sample ID	(43-140)	(44-119)	(19-119)	(44-120)	(50-134)	(10-120)
410-139657-3	NBKK-B76-IDW01A-SO-081723	76	68	45	69	87	33
410-139657-4	NBKK-B76-IDW02A-SO-081723	78	79	36	65	63	24

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
TPHd14 = p-Terphenyl-d14 (Surr)
PHL = Phenol-d5 (Surr)

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		BAPd12	FLN10	MNPd10
Lab Sample ID	Client Sample ID	(34-130)	(30-135)	(37-120)
410-139657-3 - RE	NBKK-B76-IDW01A-SO-081723	54	47	28 Q
410-139657-3	NBKK-B76-IDW01A-SO-081723	67	71	61
410-139657-4	NBKK-B76-IDW02A-SO-081723	72	77	68
LCS 410-413118/2-A	Lab Control Sample	73	74	65
LCS 410-414987/2-A	Lab Control Sample	77	79	69
LCSD 410-413118/3-A	Lab Control Sample Dup	66	67	61
MB 410-413118/1-A	Method Blank	82	83	75
MB 410-414987/1-A	Method Blank	77	81	70

Surrogate Legend

BAPd12 = Benzo(a)pyrene-d12 (Surr)
FLN10 = Fluoranthene-d10 (Surr)
MNPd10 = 1-Methylnaphthalene-d10 (Surr)

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		BAPd12	FLN10	MNPd10
Lab Sample ID	Client Sample ID	(17-120)	(43-124)	(33-120)
410-139657-1	NBKK-B76-IDW01A-AQ-081723	59 Q *	89 Q *	127 Q *
410-139657-2	NBKK-B76-IDW02A-AQ-081723	51 Q *	97 Q *	103 Q *
LCS 410-411415/2-A	Lab Control Sample	105 Q	116 Q	102 Q
MB 410-411415/1-A	Method Blank	82	84	77

Surrogate Legend

BAPd12 = Benzo(a)pyrene-d12 (Surr)
FLN10 = Fluoranthene-d10 (Surr)
MNPd10 = 1-Methylnaphthalene-d10 (Surr)

Surrogate Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-139657-1
SDG: 410-139657

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	TFT-F1 (50-150)
410-139657-3	NBKK-B76-IDW01A-SO-081723	90 *
410-139657-3	NBKK-B76-IDW01A-SO-081723	59 *
410-139657-4	NBKK-B76-IDW02A-SO-081723	74 *
410-139657-4	NBKK-B76-IDW02A-SO-081723	41 Q *
LCS 410-411048/6	Lab Control Sample	84
LCS 410-411977/6	Lab Control Sample	85
LCSD 410-411048/7	Lab Control Sample Dup	85
LCSD 410-411977/7	Lab Control Sample Dup	84
MB 410-411048/5	Method Blank	85
MB 410-411977/5	Method Blank	82

Surrogate Legend

TFT-F = a,a,a-Trifluorotoluene (fid)

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	TFT-F1 (50-150)
410-139657-1	NBKK-B76-IDW01A-AQ-081723	0.2 Q
410-139657-1	NBKK-B76-IDW01A-AQ-081723	0.4 Q *
410-139657-2	NBKK-B76-IDW02A-AQ-081723	99
LCS 410-411251/6	Lab Control Sample	90
LCS 410-411665/8	Lab Control Sample	91
LCSD 410-411251/7	Lab Control Sample Dup	91
LCSD 410-411665/9	Lab Control Sample Dup	91
MB 410-411251/5	Method Blank	99
MB 410-411665/7	Method Blank	99

Surrogate Legend

TFT-F = a,a,a-Trifluorotoluene (fid)

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	TCX1 (44-130)	TCX2 (44-130)	DCB1 (66-130)	DCB2 (66-130)
410-139657-3	NBKK-B76-IDW01A-SO-081723	127 J1	81 J1	104 Q *	97 *
410-139657-4	NBKK-B76-IDW02A-SO-081723	124	85	126 Q *	99 *
LCS 410-412414/2-A	Lab Control Sample	90	85	97	97
MB 410-412414/1-A	Method Blank	92	88	100	96

Surrogate Legend

TCX = Tetrachloro-m-xylene

DCB = DCB Decachlorobiphenyl (Surr)

Surrogate Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-139657-1
SDG: 410-139657

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCB1	DCB2	TCX1	TCX2
Lab Sample ID	Client Sample ID	(10-148)	(10-148)	(33-137)	(33-137)
410-139657-1	NBKK-B76-IDW01A-AQ-081723	82 Q *	78 *	68	56
410-139657-2	NBKK-B76-IDW02A-AQ-081723	55 Q *	49 *	77	65
LCS 410-414140/2-A	Lab Control Sample	101 *	84 *	70	57
LCSD 410-414140/3-A	Lab Control Sample Dup	106 *	89 *	79	64
MB 410-414140/1-A	Method Blank	104 *	85 *	68	56

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		OTP
Lab Sample ID	Client Sample ID	(50-150)
410-139657-3	NBKK-B76-IDW01A-SO-081723	112
410-139657-3 MS	NBKK-B76-IDW01A-SO-081723	118
410-139657-3 MSD	NBKK-B76-IDW01A-SO-081723	115
410-139657-4	NBKK-B76-IDW02A-SO-081723	117
LCS 410-411339/2-A	Lab Control Sample	124
MB 410-411339/1-A	Method Blank	113

Surrogate Legend

OTP = o- terphenyl (Surr)

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		OTP
Lab Sample ID	Client Sample ID	(50-150)
410-139657-1	NBKK-B76-IDW01A-AQ-081723	8 Q *
410-139657-1 DU	NBKK-B76-IDW01A-AQ-081723	7 Q *
410-139657-2	NBKK-B76-IDW02A-AQ-081723	71 *
LCS 410-414970/2-A	Lab Control Sample	64
LCSD 410-414970/3-A	Lab Control Sample Dup	57
MB 410-414970/1-A	Method Blank	63

Surrogate Legend

OTP = o- terphenyl (Surr)

Method: 8260D - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 410-413687/3
Matrix: Solid
Analysis Batch: 413687

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	0.60	U	1.0	0.60	0.30	ug/L		09/14/23 23:48	1
Carbon tetrachloride	0.60	U	1.0	0.60	0.30	ug/L		09/14/23 23:48	1
Chlorobenzene	0.60	U	1.0	0.60	0.30	ug/L		09/14/23 23:48	1
Chloroform	0.60	U	1.0	0.60	0.30	ug/L		09/14/23 23:48	1
1,2-Dichloroethane	0.60	U	1.0	0.60	0.30	ug/L		09/14/23 23:48	1
1,1-Dichloroethene	0.60	U	1.0	0.60	0.30	ug/L		09/14/23 23:48	1
2-Butanone	1.0	U	10	1.0	0.50	ug/L		09/14/23 23:48	1
Tetrachloroethene	0.60	U	1.0	0.60	0.30	ug/L		09/14/23 23:48	1
Trichloroethene	0.60	U	1.0	0.60	0.30	ug/L		09/14/23 23:48	1
Vinyl chloride	0.60	U	1.0	0.60	0.30	ug/L		09/14/23 23:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*81 - 118*		*09/14/23 23:48*	*1*
4-Bromofluorobenzene (Surr)	*99*		*85 - 114*		*09/14/23 23:48*	*1*
Dibromofluoromethane (Surr)	*89*		*80 - 119*		*09/14/23 23:48*	*1*
Toluene-d8 (Surr)	*102*		*89 - 112*		*09/14/23 23:48*	*1*

Lab Sample ID: LCS 410-413687/%
Matrix: Solid
Analysis Batch: 413687

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
Benzene	20.0	18.9		ug/L		95	79 - 120
Carbon tetrachloride	20.0	16.4		ug/L		82	72 - 136
Chlorobenzene	20.0	18.5		ug/L		92	82 - 118
Chloroform	20.0	17.1		ug/L		85	79 - 124
1,2-Dichloroethane	20.0	14.9		ug/L		74	73 - 128
1,1-Dichloroethene	20.0	18.0		ug/L		90	71 - 131
2-Butanone	250	215		ug/L		86	56 - 143
Tetrachloroethene	20.0	17.7		ug/L		89	74 - 129
Trichloroethene	20.0	17.1		ug/L		86	79 - 123
Vinyl chloride	20.0	16.6		ug/L		83	58 - 137

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*81 - 118*
4-Bromofluorobenzene (Surr)	*97*		*85 - 114*
Dibromofluoromethane (Surr)	*89*		*80 - 119*
Toluene-d8 (Surr)	*102*		*89 - 112*

Lab Sample ID: 410-193677-9 MS
Matrix: Solid
Analysis Batch: 413687

Client Sample ID: NBv v -B76-ID5 01A-SO-081729
Prep Type: TCLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	E Rec	E Rec Limits
Benzene	12	U	400	408	D	ug/L		102	79 - 120
Carbon tetrachloride	12	U	400	381	D	ug/L		95	72 - 136
Chlorobenzene	12	U	400	406	D	ug/L		101	82 - 118
Chloroform	12	U	400	367	D	ug/L		92	79 - 124

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 410-1936%7-9 MS
Matrix: Solid
Analysis Batch: 413687

Client Sample ID: NBv v -B76-ID5 01A-SO-081729
Prep Type: TCLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	E Rec	E Rec Limits
1,2-Dichloroethane	12	U Q *	400	318	D	ug/L		79	73 - 128
1,1-Dichloroethene	12	U	400	394	D	ug/L		99	71 - 131
2-Butanone	20	U M	5000	4250	D	ug/L		85	56 - 143
Tetrachloroethene	12	U	400	407	D	ug/L		102	74 - 129
Trichloroethene	12	U	400	377	D	ug/L		94	79 - 123
Vinyl chloride	12	U	400	338	D	ug/L		85	58 - 137

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*81 - 118*
4-Bromofluorobenzene (Surr)	*97*		*85 - 114*
Dibromofluoromethane (Surr)	*89*		*80 - 119*
Toluene-d8 (Surr)	*103*		*89 - 112*

Method: 8270K - SemiVolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 410-41%416/1-A
Matrix: Solid
Analysis Batch: 41%464

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 41%416

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0050	U	0.010	0.0050	0.0025	mg/L		09/01/23 19:33	1
2,4,5-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		09/01/23 19:33	1
2,4,6-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		09/01/23 19:33	1
2,4-Dinitrotoluene	0.010	U M	0.025	0.010	0.0050	mg/L		09/01/23 19:33	1
2-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		09/01/23 19:33	1
4-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		09/01/23 19:33	1
Hexachlorobenzene	0.0011	U	0.0025	0.0011	0.00055	mg/L		09/01/23 19:33	1
Hexachlorobutadiene	0.0050	U	0.010	0.0050	0.0025	mg/L		09/01/23 19:33	1
Hexachloroethane	0.0050	U	0.025	0.0050	0.0025	mg/L		09/01/23 19:33	1
Nitrobenzene	0.0050	U M	0.010	0.0050	0.0025	mg/L		09/01/23 19:33	1
Pentachlorophenol	0.020	U	0.025	0.020	0.0050	mg/L		09/01/23 19:33	1
Pyridine	0.020	U	0.025	0.020	0.010	mg/L		09/01/23 19:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*85*		*43 - 140*	*09/01/23 15:27*	*09/01/23 19:33*	*1*
2-Fluorobiphenyl (Surr)	*72*		*44 - 119*	*09/01/23 15:27*	*09/01/23 19:33*	*1*
2-Fluorophenol (Surr)	*30*		*19 - 119*	*09/01/23 15:27*	*09/01/23 19:33*	*1*
Nitrobenzene-d5 (Surr)	*62*		*44 - 120*	*09/01/23 15:27*	*09/01/23 19:33*	*1*
p-Terphenyl-d14 (Surr)	*85*		*50 - 134*	*09/01/23 15:27*	*09/01/23 19:33*	*1*
Phenol-d5 (Surr)	*19*		*10 - 120*	*09/01/23 15:27*	*09/01/23 19:33*	*1*

Lab Sample ID: LCS 410-41%416/2-A
Matrix: Solid
Analysis Batch: 41%464

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 41%416

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
1,4-Dichlorobenzene	0.250	0.170		mg/L		68	29 - 112
2,4,5-Trichlorophenol	0.250	0.225		mg/L		90	53 - 123

Method: 8270K - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 410-41[illegible]416/2-A
Matrix: Solid
Analysis Batch: 41[illegible]464

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 41[illegible]416

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
2,4,6-Trichlorophenol	0.250	0.247		mg/L		99	50 - 125
2,4-Dinitrotoluene	0.250	0.266		mg/L		107	57 - 128
2-Methylphenol	0.250	0.154		mg/L		62	30 - 117
4-Methylphenol	0.250	0.143		mg/L		57	25 - 120
Hexachlorobenzene	0.250	0.232		mg/L		93	53 - 125
Hexachlorobutadiene	0.250	0.170		mg/L		68	22 - 124
Hexachloroethane	0.250	0.160		mg/L		64	21 - 115
Nitrobenzene	0.250	0.190		mg/L		76	45 - 121
Pentachlorophenol	0.500	0.628		mg/L		126	35 - 138
Pyridine	0.500	0.162		mg/L		32	23 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*82*		*43 - 140*
2-Fluorobiphenyl (Surr)	*62*		*44 - 119*
2-Fluorophenol (Surr)	*32*		*19 - 119*
Nitrobenzene-d5 (Surr)	*56*		*44 - 120*
p-Terphenyl-d14 (Surr)	*75*		*50 - 134*
Phenol-d5 (Surr)	*21*		*10 - 120*

Lab Sample ID: LCSD 410-41[illegible]416/9-A
Matrix: Solid
Analysis Batch: 41[illegible]464

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 41[illegible]416

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	E Rec	E Rec Limits	RPD	RPD Limit
1,4-Dichlorobenzene	0.250	0.195		mg/L		78	29 - 112	13	20
2,4,5-Trichlorophenol	0.250	0.221		mg/L		88	53 - 123	2	20
2,4,6-Trichlorophenol	0.250	0.213		mg/L		85	50 - 125	15	20
2,4-Dinitrotoluene	0.250	0.289		mg/L		116	57 - 128	8	20
2-Methylphenol	0.250	0.172		mg/L		69	30 - 117	11	20
4-Methylphenol	0.250	0.163		mg/L		65	25 - 120	13	20
Hexachlorobenzene	0.250	0.252		mg/L		101	53 - 125	8	20
Hexachlorobutadiene	0.250	0.197		mg/L		79	22 - 124	15	20
Hexachloroethane	0.250	0.181		mg/L		72	21 - 115	12	20
Nitrobenzene	0.250	0.229		mg/L		92	45 - 121	18	20
Pentachlorophenol	0.500	0.428	Q	mg/L		86	35 - 138	38	20
Pyridine	0.500	0.199		mg/L		40	23 - 120	21	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*79*		*43 - 140*
2-Fluorobiphenyl (Surr)	*74*		*44 - 119*
2-Fluorophenol (Surr)	*29*		*19 - 119*
Nitrobenzene-d5 (Surr)	*67*		*44 - 120*
p-Terphenyl-d14 (Surr)	*73*		*50 - 134*
Phenol-d5 (Surr)	*23*		*10 - 120*

Method: 8270K - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 410-41[illegible]3/1-A
Matrix: Solid
Analysis Batch: 416168

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 41[illegible]3

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0050	U	0.010	0.0050	0.0025	mg/L		09/05/23 20:32	1
2,4,5-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		09/05/23 20:32	1
2,4,6-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		09/05/23 20:32	1
2,4-Dinitrotoluene	0.010	U	0.025	0.010	0.0050	mg/L		09/05/23 20:32	1
2-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		09/05/23 20:32	1
4-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		09/05/23 20:32	1
Hexachlorobenzene	0.0011	U	0.0025	0.0011	0.00055	mg/L		09/05/23 20:32	1
Hexachlorobutadiene	0.0050	U	0.010	0.0050	0.0025	mg/L		09/05/23 20:32	1
Hexachloroethane	0.0050	U	0.025	0.0050	0.0025	mg/L		09/05/23 20:32	1
Nitrobenzene	0.0050	U M	0.010	0.0050	0.0025	mg/L		09/05/23 20:32	1
Pentachlorophenol	0.020	U	0.025	0.020	0.0050	mg/L		09/05/23 20:32	1
Pyridine	0.020	U	0.025	0.020	0.010	mg/L		09/05/23 20:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*72*		*43 - 140*	*09/05/23 08:38*	*09/05/23 20:32*	*1*
2-Fluorobiphenyl (Surr)	*67*		*44 - 119*	*09/05/23 08:38*	*09/05/23 20:32*	*1*
2-Fluorophenol (Surr)	*48*		*19 - 119*	*09/05/23 08:38*	*09/05/23 20:32*	*1*
Nitrobenzene-d5 (Surr)	*76*		*44 - 120*	*09/05/23 08:38*	*09/05/23 20:32*	*1*
p-Terphenyl-d14 (Surr)	*85*		*50 - 134*	*09/05/23 08:38*	*09/05/23 20:32*	*1*
Phenol-d5 (Surr)	*34*		*10 - 120*	*09/05/23 08:38*	*09/05/23 20:32*	*1*

Lab Sample ID: LCS 410-41[illegible]3/2-A
Matrix: Solid
Analysis Batch: 416168

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 41[illegible]3

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
1,4-Dichlorobenzene	0.250	0.197		mg/L		79	29 - 112
2,4,5-Trichlorophenol	0.250	0.301		mg/L		120	53 - 123
2,4,6-Trichlorophenol	0.250	0.307		mg/L		123	50 - 125
2,4-Dinitrotoluene	0.250	0.289		mg/L		116	57 - 128
2-Methylphenol	0.250	0.222		mg/L		89	30 - 117
4-Methylphenol	0.250	0.199		mg/L		80	25 - 120
Hexachlorobenzene	0.250	0.275		mg/L		110	53 - 125
Hexachlorobutadiene	0.250	0.202		mg/L		81	22 - 124
Hexachloroethane	0.250	0.194		mg/L		77	21 - 115
Nitrobenzene	0.250	0.259		mg/L		103	45 - 121
Pentachlorophenol	0.500	0.608		mg/L		122	35 - 138
Pyridine	0.500	0.283		mg/L		57	23 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*83*		*43 - 140*
2-Fluorobiphenyl (Surr)	*83*		*44 - 119*
2-Fluorophenol (Surr)	*51*		*19 - 119*
Nitrobenzene-d5 (Surr)	*82*		*44 - 120*
p-Terphenyl-d14 (Surr)	*83*		*50 - 134*
Phenol-d5 (Surr)	*34*		*10 - 120*

Method: 8270K - SemiVolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 410-41[illegible]/9-A
Matrix: Solid
Analysis Batch: 416168

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 41[illegible]

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	E Rec	E Rec Limits	RPD	RPD Limit
1,4-Dichlorobenzene			0.250	0.188		mg/L		75	29 - 112	5	20
2,4,5-Trichlorophenol			0.250	0.294		mg/L		117	53 - 123	2	20
2,4,6-Trichlorophenol			0.250	0.289		mg/L		116	50 - 125	6	20
2,4-Dinitrotoluene			0.250	0.291		mg/L		117	57 - 128	1	20
2-Methylphenol			0.250	0.226		mg/L		90	30 - 117	2	20
4-Methylphenol			0.250	0.200		mg/L		80	25 - 120	0	20
Hexachlorobenzene			0.250	0.258		mg/L		103	53 - 125	6	20
Hexachlorobutadiene			0.250	0.215		mg/L		86	22 - 124	6	20
Hexachloroethane			0.250	0.197		mg/L		79	21 - 115	2	20
Nitrobenzene			0.250	0.268		mg/L		107	45 - 121	4	20
Pentachlorophenol			0.500	0.592		mg/L		118	35 - 138	3	20
Pyridine			0.500	0.266		mg/L		53	23 - 120	6	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*84*		*43 - 140*
2-Fluorobiphenyl (Surr)	*75*		*44 - 119*
2-Fluorophenol (Surr)	*50*		*19 - 119*
Nitrobenzene-d5 (Surr)	*84*		*44 - 120*
p-Terphenyl-d14 (Surr)	*80*		*50 - 134*
Phenol-d5 (Surr)	*35*		*10 - 120*

Method: 8270K SIM - SemiVolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 410-41141[illegible]1-A
Matrix: 5 ater
Analysis Batch: 411831

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 41141%

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	0.040	U	0.050	0.040	0.020	ug/L		08/24/23 08:39	1
2-Methylnaphthalene	0.040	U	0.050	0.040	0.020	ug/L		08/24/23 08:39	1
Acenaphthene	0.030	U	0.050	0.030	0.010	ug/L		08/24/23 08:39	1
Acenaphthylene	0.030	U	0.050	0.030	0.010	ug/L		08/24/23 08:39	1
Anthracene	0.030	U	0.050	0.030	0.010	ug/L		08/24/23 08:39	1
Benzo[a]anthracene	0.030	U	0.050	0.030	0.010	ug/L		08/24/23 08:39	1
Benzo[a]pyrene	0.030	U	0.050	0.030	0.010	ug/L		08/24/23 08:39	1
Benzo[b]fluoranthene	0.030	U	0.050	0.030	0.010	ug/L		08/24/23 08:39	1
Benzo[g,h,i]perylene	0.030	U	0.050	0.030	0.010	ug/L		08/24/23 08:39	1
Benzo[k]fluoranthene	0.030	U	0.050	0.030	0.010	ug/L		08/24/23 08:39	1
Chrysene	0.030	U	0.050	0.030	0.010	ug/L		08/24/23 08:39	1
Dibenz(a,h)anthracene	0.040	U	0.050	0.040	0.020	ug/L		08/24/23 08:39	1
Fluoranthene	0.030	U	0.050	0.030	0.010	ug/L		08/24/23 08:39	1
Fluorene	0.030	U	0.050	0.030	0.010	ug/L		08/24/23 08:39	1
Indeno[1,2,3-cd]pyrene	0.040	U	0.050	0.040	0.020	ug/L		08/24/23 08:39	1
Naphthalene	0.060	U	0.070	0.060	0.030	ug/L		08/24/23 08:39	1
Phenanthrene	0.060	U	0.070	0.060	0.030	ug/L		08/24/23 08:39	1
Pyrene	0.030	U	0.050	0.030	0.010	ug/L		08/24/23 08:39	1

Method: 8270K SIM - SemiVolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: MB 410-41141%1-A
Matrix: 5 ater
Analysis Batch: 411831

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 41141%

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(a)pyrene-d12 (Surr)	82		17 - 120	08/23/23 07:52	08/24/23 08:39	1
Fluoranthene-d10 (Surr)	84		43 - 124	08/23/23 07:52	08/24/23 08:39	1
1-Methylnaphthalene-d10 (Surr)	77		33 - 120	08/23/23 07:52	08/24/23 08:39	1

Lab Sample ID: LCS 410-41141%2-A
Matrix: 5 ater
Analysis Batch: 411831

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 41141%

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
1-Methylnaphthalene	1.00	0.952	Q	ug/L		95	41 - 115
2-Methylnaphthalene	1.00	0.837	Q	ug/L		84	39 - 114
Acenaphthene	1.00	0.896	Q	ug/L		90	48 - 114
Acenaphthylene	1.00	1.01	Q	ug/L		101	35 - 121
Anthracene	1.00	1.04	Q	ug/L		104	53 - 119
Benzo[a]anthracene	1.00	0.939		ug/L		94	59 - 120
Benzo[a]pyrene	1.00	1.08	Q	ug/L		108	53 - 120
Benzo[b]fluoranthene	1.00	1.08	Q	ug/L		108	53 - 126
Benzo[g,h,i]perylene	1.00	1.00	Q	ug/L		100	44 - 128
Benzo[k]fluoranthene	1.00	1.01	Q	ug/L		101	54 - 125
Chrysene	1.00	0.992		ug/L		99	57 - 120
Dibenz(a,h)anthracene	1.00	1.02	Q	ug/L		102	44 - 131
Fluoranthene	1.00	1.16	Q	ug/L		116	58 - 120
Fluorene	1.00	1.03	Q	ug/L		103	50 - 118
Indeno[1,2,3-cd]pyrene	1.00	1.18	M Q	ug/L		118	48 - 130
Naphthalene	1.00	0.913	Q	ug/L		91	43 - 114
Phenanthrene	1.00	1.04	Q	ug/L		104	53 - 115
Pyrene	1.00	0.831		ug/L		83	53 - 121

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Benzo(a)pyrene-d12 (Surr)	105	Q	17 - 120
Fluoranthene-d10 (Surr)	116	Q	43 - 124
1-Methylnaphthalene-d10 (Surr)	102	Q	33 - 120

Lab Sample ID: MB 410-419118/1-A
Matrix: Solid
Analysis Batch: 414083

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 419118

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		08/30/23 04:44	1
2-Methylnaphthalene	0.0027	U	0.0033	0.0027	0.0013	mg/Kg		08/30/23 04:44	1
Acenaphthene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		08/30/23 04:44	1
Acenaphthylene	0.0013	U	0.0017	0.0013	0.00033	mg/Kg		08/30/23 04:44	1
Anthracene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		08/30/23 04:44	1
Benzo[a]anthracene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		08/30/23 04:44	1
Benzo[a]pyrene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		08/30/23 04:44	1
Benzo[b]fluoranthene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		08/30/23 04:44	1
Benzo[g,h,i]perylene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		08/30/23 04:44	1
Benzo[k]fluoranthene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		08/30/23 04:44	1

Method: 8270K SIM - SemiVolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: MB 410-419118/1-A
Matrix: Solid
Analysis Batch: 414083

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 419118

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chrysene	0.0013	U	0.0017	0.0013	0.00033	mg/Kg		08/30/23 04:44	1
Dibenz(a,h)anthracene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		08/30/23 04:44	1
Fluoranthene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		08/30/23 04:44	1
Fluorene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		08/30/23 04:44	1
Indeno[1,2,3-cd]pyrene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		08/30/23 04:44	1
Naphthalene	0.0027	U	0.0033	0.0027	0.0013	mg/Kg		08/30/23 04:44	1
Phenanthrene	0.0020	U	0.0023	0.0020	0.0010	mg/Kg		08/30/23 04:44	1
Pyrene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		08/30/23 04:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*82*		*34 - 130*	*08/28/23 09:11*	*08/30/23 04:44*	*1*
Fluoranthene-d10 (Surr)	*83*		*30 - 135*	*08/28/23 09:11*	*08/30/23 04:44*	*1*
1-Methylnaphthalene-d10 (Surr)	*75*		*37 - 120*	*08/28/23 09:11*	*08/30/23 04:44*	*1*

Lab Sample ID: LCS 410-419118/2-A
Matrix: Solid
Analysis Batch: 414083

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 419118

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
1-Methylnaphthalene	0.0333	0.0259		mg/Kg		78	43 - 111
2-Methylnaphthalene	0.0333	0.0257		mg/Kg		77	39 - 114
Acenaphthene	0.0333	0.0290		mg/Kg		87	44 - 111
Acenaphthylene	0.0333	0.0300		mg/Kg		90	39 - 116
Anthracene	0.0333	0.0328		mg/Kg		98	50 - 114
Benzo[a]anthracene	0.0333	0.0317		mg/Kg		95	54 - 122
Benzo[a]pyrene	0.0333	0.0324		mg/Kg		97	50 - 125
Benzo[b]fluoranthene	0.0333	0.0307		mg/Kg		92	53 - 128
Benzo[g,h,i]perylene	0.0333	0.0296		mg/Kg		89	49 - 127
Benzo[k]fluoranthene	0.0333	0.0333		mg/Kg		100	56 - 123
Chrysene	0.0333	0.0310		mg/Kg		93	57 - 118
Dibenz(a,h)anthracene	0.0333	0.0300		mg/Kg		90	50 - 129
Fluoranthene	0.0333	0.0314		mg/Kg		94	55 - 119
Fluorene	0.0333	0.0297		mg/Kg		89	47 - 114
Indeno[1,2,3-cd]pyrene	0.0333	0.0346	M	mg/Kg		104	49 - 130
Naphthalene	0.0333	0.0267		mg/Kg		80	38 - 111
Phenanthrene	0.0333	0.0309		mg/Kg		93	49 - 113
Pyrene	0.0333	0.0300		mg/Kg		90	55 - 117

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Benzo(a)pyrene-d12 (Surr)	*73*		*34 - 130*
Fluoranthene-d10 (Surr)	*74*		*30 - 135*
1-Methylnaphthalene-d10 (Surr)	*65*		*37 - 120*

Method: 8270K SIM - SemiVolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCSD 410-419118/9-A
Matrix: Solid
Analysis Batch: 414083

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 419118

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	E Rec	E Rec Limits	RPD	RPD Limit
1-Methylnaphthalene			0.0333	0.0244		mg/Kg		73	43 - 111	6	20
2-Methylnaphthalene			0.0333	0.0245		mg/Kg		73	39 - 114	5	20
Acenaphthene			0.0333	0.0276		mg/Kg		83	44 - 111	5	20
Acenaphthylene			0.0333	0.0283		mg/Kg		85	39 - 116	6	20
Anthracene			0.0333	0.0300		mg/Kg		90	50 - 114	9	20
Benzo[a]anthracene			0.0333	0.0288		mg/Kg		87	54 - 122	9	20
Benzo[a]pyrene			0.0333	0.0299		mg/Kg		90	50 - 125	8	20
Benzo[b]fluoranthene			0.0333	0.0282		mg/Kg		84	53 - 128	9	20
Benzo[g,h,i]perylene			0.0333	0.0272		mg/Kg		81	49 - 127	9	20
Benzo[k]fluoranthene			0.0333	0.0308		mg/Kg		92	56 - 123	8	20
Chrysene			0.0333	0.0284		mg/Kg		85	57 - 118	9	20
Dibenz(a,h)anthracene			0.0333	0.0275		mg/Kg		83	50 - 129	9	20
Fluoranthene			0.0333	0.0285		mg/Kg		85	55 - 119	10	20
Fluorene			0.0333	0.0275		mg/Kg		83	47 - 114	8	20
Indeno[1,2,3-cd]pyrene			0.0333	0.0297	M	mg/Kg		89	49 - 130	15	20
Naphthalene			0.0333	0.0254		mg/Kg		76	38 - 111	5	20
Phenanthrene			0.0333	0.0281		mg/Kg		84	49 - 113	9	20
Pyrene			0.0333	0.0275		mg/Kg		83	55 - 117	9	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Benzo(a)pyrene-d12 (Surr)	66		*34 - 130*
Fluoranthene-d10 (Surr)	67		*30 - 135*
1-Methylnaphthalene-d10 (Surr)	61		*37 - 120*

Lab Sample ID: MB 410-414387/1-A
Matrix: Solid
Analysis Batch: 414123

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 414387

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	0.00118	J	0.0017	0.0013	0.00067	mg/Kg		09/01/23 04:43	1
2-Methylnaphthalene	0.00254	J M	0.0033	0.0027	0.0013	mg/Kg		09/01/23 04:43	1
Acenaphthene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		09/01/23 04:43	1
Acenaphthylene	0.0013	U	0.0017	0.0013	0.00033	mg/Kg		09/01/23 04:43	1
Anthracene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		09/01/23 04:43	1
Benzo[a]anthracene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		09/01/23 04:43	1
Benzo[a]pyrene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		09/01/23 04:43	1
Benzo[b]fluoranthene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		09/01/23 04:43	1
Benzo[g,h,i]perylene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		09/01/23 04:43	1
Benzo[k]fluoranthene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		09/01/23 04:43	1
Chrysene	0.0013	U	0.0017	0.0013	0.00033	mg/Kg		09/01/23 04:43	1
Dibenz(a,h)anthracene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		09/01/23 04:43	1
Fluoranthene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		09/01/23 04:43	1
Fluorene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		09/01/23 04:43	1
Indeno[1,2,3-cd]pyrene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		09/01/23 04:43	1
Naphthalene	0.0027	U	0.0033	0.0027	0.0013	mg/Kg		09/01/23 04:43	1
Phenanthrene	0.0020	U	0.0023	0.0020	0.0010	mg/Kg		09/01/23 04:43	1
Pyrene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		09/01/23 04:43	1

Method: 8270K SIM - SemiVolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: MB 410-414387/1-A
Matrix: Solid
Analysis Batch: 41%123

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 414387

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(a)pyrene-d12 (Surr)	*77*		*34 - 130*	*08/31/23 16:25*	*09/01/23 04:43*	*1*
Fluoranthene-d10 (Surr)	*81*		*30 - 135*	*08/31/23 16:25*	*09/01/23 04:43*	*1*
1-Methylnaphthalene-d10 (Surr)	*70*		*37 - 120*	*08/31/23 16:25*	*09/01/23 04:43*	*1*

Lab Sample ID: LCS 410-414387/2-A
Matrix: Solid
Analysis Batch: 41%123

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 414387

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
1-Methylnaphthalene	0.0333	0.0268		mg/Kg		80	43 - 111
2-Methylnaphthalene	0.0333	0.0266		mg/Kg		80	39 - 114
Acenaphthene	0.0333	0.0302		mg/Kg		91	44 - 111
Acenaphthylene	0.0333	0.0310		mg/Kg		93	39 - 116
Anthracene	0.0333	0.0331		mg/Kg		99	50 - 114
Benzo[a]anthracene	0.0333	0.0325		mg/Kg		97	54 - 122
Benzo[a]pyrene	0.0333	0.0329		mg/Kg		99	50 - 125
Benzo[b]fluoranthene	0.0333	0.0323		mg/Kg		97	53 - 128
Benzo[g,h,i]perylene	0.0333	0.0304		mg/Kg		91	49 - 127
Benzo[k]fluoranthene	0.0333	0.0323		mg/Kg		97	56 - 123
Chrysene	0.0333	0.0312		mg/Kg		94	57 - 118
Dibenz(a,h)anthracene	0.0333	0.0306		mg/Kg		92	50 - 129
Fluoranthene	0.0333	0.0317		mg/Kg		95	55 - 119
Fluorene	0.0333	0.0306		mg/Kg		92	47 - 114
Indeno[1,2,3-cd]pyrene	0.0333	0.0353	M	mg/Kg		106	49 - 130
Naphthalene	0.0333	0.0272		mg/Kg		82	38 - 111
Phenanthrene	0.0333	0.0314		mg/Kg		94	49 - 113
Pyrene	0.0333	0.0302		mg/Kg		91	55 - 117

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Benzo(a)pyrene-d12 (Surr)	*77*		*34 - 130*
Fluoranthene-d10 (Surr)	*79*		*30 - 135*
1-Methylnaphthalene-d10 (Surr)	*69*		*37 - 120*

Method: N5 TPH-Gx - Northwest - Volatile Petroleum Products (GC)

Lab Sample ID: MB 410-411048/%
Matrix: Solid
Analysis Batch: 411048

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	0.50	U	5.0	0.50	0.23	mg/Kg		08/22/23 12:02	25

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene (fid) (1C)	*85*		*50 - 150*		*08/22/23 12:02*	*25*

Method: N5 TPH-Gx - Northwest - Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCS 410-411048/6
Matrix: Solid
Analysis Batch: 411048

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits		
C7-C12 (1C)			11.0	9.08	D	mg/Kg		83	55 - 145		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*84*		*50 - 150*

Lab Sample ID: LCSD 410-411048/7
Matrix: Solid
Analysis Batch: 411048

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	E Rec	E Rec Limits	RPD	RPD Limit
C7-C12 (1C)			11.0	9.08	D	mg/Kg		83	55 - 145	0	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*85*		*50 - 150*

Lab Sample ID: MB 410-4112%1/%
Matrix: 5 ater
Analysis Batch: 4112%1

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	85	U M	250	85	43	ug/L		08/22/23 18:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*99*		*50 - 150*		*08/22/23 18:01*	*1*

Lab Sample ID: LCS 410-4112%1/6
Matrix: 5 ater
Analysis Batch: 4112%1

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits		
C7-C12 (1C)			1100	1040	M	ug/L		95	64 - 131		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*90*		*50 - 150*

Lab Sample ID: LCSD 410-4112%1/7
Matrix: 5 ater
Analysis Batch: 4112%1

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	E Rec	E Rec Limits	RPD	RPD Limit
C7-C12 (1C)			1100	1070	M	ug/L		98	64 - 131	3	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*91*		*50 - 150*

Method: N5 TPH-Gx - Northwest - Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: MB 410-41166%7
Matrix: 5 ater
Analysis Batch: 41166%

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	85	U M	250	85	43	ug/L		08/23/23 20:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*99*		*50 - 150*		*08/23/23 20:33*	*1*

Lab Sample ID: LCS 410-41166%8
Matrix: 5 ater
Analysis Batch: 41166%

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits		
C7-C12 (1C)			1100	1050	M	ug/L		95	64 - 131		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*91*		*50 - 150*

Lab Sample ID: LCSD 410-41166%3
Matrix: 5 ater
Analysis Batch: 41166%

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	E Rec	E Rec Limits	RPD	RPD Limit
C7-C12 (1C)			1100	1080	M	ug/L		98	64 - 131	3	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*91*		*50 - 150*

Lab Sample ID: MB 410-411377/%
Matrix: Solid
Analysis Batch: 411377

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	0.50	U	5.0	0.50	0.23	mg/Kg		08/24/23 12:03	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*82*		*50 - 150*		*08/24/23 12:03*	*25*

Lab Sample ID: LCS 410-411377/6
Matrix: Solid
Analysis Batch: 411377

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits		
C7-C12 (1C)			11.0	8.94	D	mg/Kg		81	55 - 145		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*85*		*50 - 150*

Method: N5 TPH-Gx - Northwest - Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCSD 410-411377/7
Matrix: Solid
Analysis Batch: 411377

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	E Rec	E Rec Limits	RPD	RPD Limit
C7-C12 (1C)			11.0	8.74	D	mg/Kg		79	55 - 145	2	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*84*		*50 - 150*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 410-412414/1-A
Matrix: Solid
Analysis Batch: 412776

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 412414

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016 (1C)	0.010	U	0.017	0.010	0.0053	mg/Kg		08/25/23 20:12	1
PCB-1221 (1C)	0.010	U	0.017	0.010	0.0053	mg/Kg		08/25/23 20:12	1
PCB-1232 (1C)	0.010	U	0.017	0.010	0.0053	mg/Kg		08/25/23 20:12	1
PCB-1242 (1C)	0.010	U	0.017	0.010	0.0053	mg/Kg		08/25/23 20:12	1
PCB-1248 (1C)	0.010	U	0.017	0.010	0.0053	mg/Kg		08/25/23 20:12	1
PCB-1254 (1C)	0.010	U M	0.017	0.010	0.0064	mg/Kg		08/25/23 20:12	1
PCB-1260 (1C)	0.010	U	0.017	0.010	0.0064	mg/Kg		08/25/23 20:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (1C)	*92*		*44 - 130*	*08/25/23 09:07*	*08/25/23 20:12*	*1*
Tetrachloro-m-xylene (2C)	*88*		*44 - 130*	*08/25/23 09:07*	*08/25/23 20:12*	*1*
DCB Decachlorobiphenyl (Surr) (1C)	*100*		*66 - 130*	*08/25/23 09:07*	*08/25/23 20:12*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*96*		*66 - 130*	*08/25/23 09:07*	*08/25/23 20:12*	*1*

Lab Sample ID: LCS 410-412414/2-A
Matrix: Solid
Analysis Batch: 412776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 412414

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
PCB-1016 (1C)			0.167	0.170		mg/Kg		102	47 - 134
PCB-1260 (1C)			0.167	0.157		mg/Kg		94	53 - 140

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene (1C)	*90*		*44 - 130*
Tetrachloro-m-xylene (2C)	*85*		*44 - 130*
DCB Decachlorobiphenyl (Surr) (1C)	*97*		*66 - 130*
DCB Decachlorobiphenyl (Surr) (2C)	*97*		*66 - 130*

Lab Sample ID: MB 410-414140/1-A
Matrix: 5 ater
Analysis Batch: 414664

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 414140

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016 (2C)	0.20	U	0.25	0.20	0.10	ug/L		08/31/23 13:18	1

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: MB 410-414140/1-A
Matrix: 5 ater
Analysis Batch: 414664

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 414140

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1221 (2C)	0.20	U	0.25	0.20	0.10	ug/L		08/31/23 13:18	1
PCB-1232 (2C)	0.20	U	0.25	0.20	0.10	ug/L		08/31/23 13:18	1
PCB-1242 (2C)	0.20	U	0.25	0.20	0.10	ug/L		08/31/23 13:18	1
PCB-1248 (2C)	0.20	U	0.25	0.20	0.10	ug/L		08/31/23 13:18	1
PCB-1254 (2C)	0.20	U	0.25	0.20	0.078	ug/L		08/31/23 13:18	1
PCB-1260 (2C)	0.20	U	0.25	0.20	0.078	ug/L		08/31/23 13:18	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (1C)	*68*		*33 - 137*	*08/30/23 07:53*	*08/31/23 13:18*	*1*
Tetrachloro-m-xylene (2C)	*56*		*33 - 137*	*08/30/23 07:53*	*08/31/23 13:18*	*1*
DCB Decachlorobiphenyl (Surr) (1C)	*104*	*	*10 - 148*	*08/30/23 07:53*	*08/31/23 13:18*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*85*	*	*10 - 148*	*08/30/23 07:53*	*08/31/23 13:18*	*1*

Lab Sample ID: LCS 410-414140/2-A
Matrix: 5 ater
Analysis Batch: 414664

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 414140

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits		
PCB-1016 (2C)			5.01	4.04		ug/L		81	46 - 129		
PCB-1260 (2C)			5.02	4.27		ug/L		85	45 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene (1C)	*70*		*33 - 137*
Tetrachloro-m-xylene (2C)	*57*		*33 - 137*
DCB Decachlorobiphenyl (Surr) (1C)	*101*	*	*10 - 148*
DCB Decachlorobiphenyl (Surr) (2C)	*84*	*	*10 - 148*

Lab Sample ID: LCSD 410-414140/9-A
Matrix: 5 ater
Analysis Batch: 414664

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 414140

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	E Rec	E Rec Limits	RPD	RPD Limit
PCB-1016 (2C)			5.01	4.02		ug/L		80	46 - 129	1	30
PCB-1260 (2C)			5.02	4.37		ug/L		87	45 - 134	2	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tetrachloro-m-xylene (1C)	*79*		*33 - 137*
Tetrachloro-m-xylene (2C)	*64*		*33 - 137*
DCB Decachlorobiphenyl (Surr) (1C)	*106*	*	*10 - 148*
DCB Decachlorobiphenyl (Surr) (2C)	*89*	*	*10 - 148*

Method: N5 TPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 410-411993/1-A
Matrix: Solid
Analysis Batch: 419%%%

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 411993

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C12-C24	8.0	U M	10	8.0	4.0	mg/Kg		08/26/23 02:03	1
C24-C40	20	U	30	20	10	mg/Kg		08/26/23 02:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*113*		*50 - 150*	*08/23/23 03:10*	*08/26/23 02:03*	*1*

Lab Sample ID: LCS 410-411993/2-A
Matrix: Solid
Analysis Batch: 419%%%

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 411993

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits		
C12-C24			134	108	M	mg/Kg		80	74 - 115		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o- terphenyl (Surr)	*124*		*50 - 150*

Lab Sample ID: 410-1936%7-9 MS
Matrix: Solid
Analysis Batch: 419%%%

Client Sample ID: NBv v -B76-ID5 01A-SO-081729
Prep Type: Total/NA
Prep Batch: 411993

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	E Rec	E Rec Limits		
C12-C24	15	M J1	152	94.5	M J1	mg/Kg	☼	52	74 - 115		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
o- terphenyl (Surr)	*118*		*50 - 150*

Lab Sample ID: 410-1936%7-9 MSD
Matrix: Solid
Analysis Batch: 419%%%

Client Sample ID: NBv v -B76-ID5 01A-SO-081729
Prep Type: Total/NA
Prep Batch: 411993

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	E Rec	E Rec Limits	RPD	RPD Limit
C12-C24	15	M J1	152	82.7	M J1	mg/Kg	☼	45	74 - 115	13	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
o- terphenyl (Surr)	*115*		*50 - 150*

Lab Sample ID: MB 410-414370/1-A
Matrix: 5 ater
Analysis Batch: 41%300

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 414370

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C12-C24	90	U M	100	90	45	ug/L		09/05/23 14:18	1
C24-C40	240	U M	250	240	100	ug/L		09/05/23 14:18	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*63*		*50 - 150*	*08/31/23 15:24*	*09/05/23 14:18*	*1*

Method: N5 TPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCS 410-414370/2-A
Matrix: 5 ater
Analysis Batch: 41%300

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 414370

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits		
C12-C24			604	205		ug/L		34	14 - 115		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o- terphenyl (Surr)	*64*		*50 - 150*

Lab Sample ID: LCSD 410-414370/9-A
Matrix: 5 ater
Analysis Batch: 41%300

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 414370

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	E Rec	E Rec Limits	RPD	RPD Limit
C12-C24			604	99.9	J Q	ug/L		17	14 - 115	69	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o- terphenyl (Surr)	*57*		*50 - 150*

Lab Sample ID: 410-1936%7-1 DU
Matrix: 5 ater
Analysis Batch: 41%300

Client Sample ID: NBv v -B76-ID5 01A-AQ-081729
Prep Type: Total/NA
Prep Batch: 414370

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
C12-C24	3200	M Q *		2900	M Q *	ug/L				11	20
C24-C40	1400	M *		1320	M *	ug/L				3	20

Surrogate	*DU %Recovery*	*DU Qualifier*	*Limits*
o- terphenyl (Surr)	*7*	*Q **	*50 - 150*

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 410-410968/1-A
Matrix: Solid
Analysis Batch: 417723

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 410968

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	0.36	U	0.40	0.36	0.18	mg/Kg		09/09/23 12:13	2

Lab Sample ID: MB 410-410968/1-A ^2
Matrix: Solid
Analysis Batch: 414889

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 410968

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	0.32	U	0.40	0.32	0.13	mg/Kg		08/31/23 10:12	2
Cadmium	0.080	U	0.10	0.080	0.040	mg/Kg		08/31/23 10:12	2
Chromium	0.38	U	0.40	0.38	0.19	mg/Kg		08/31/23 10:12	2
Copper	0.36	U	0.40	0.36	0.18	mg/Kg		08/31/23 10:12	2
Lead	0.16	U	0.20	0.16	0.076	mg/Kg		08/31/23 10:12	2
Nickel	0.38	U	0.40	0.38	0.19	mg/Kg		08/31/23 10:12	2
Selenium	0.20	U	0.40	0.20	0.10	mg/Kg		08/31/23 10:12	2
Silver	0.080	U	0.10	0.080	0.041	mg/Kg		08/31/23 10:12	2

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 410-410968/1-A ^2
Matrix: Solid
Analysis Batch: 414889

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 410968

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Zinc	8.0	U	30	8.0	4.0	mg/Kg		08/31/23 10:12	2

Lab Sample ID: LCS 410-410968/2-A
Matrix: Solid
Analysis Batch: 417723

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 410968

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
Barium	50.0	53.3	D	mg/Kg		107	86 - 116

Lab Sample ID: LCS 410-410968/2-A ^2
Matrix: Solid
Analysis Batch: 414889

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 410968

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
Arsenic	50.0	50.0	D	mg/Kg		100	82 - 118
Cadmium	5.00	5.03	D	mg/Kg		101	84 - 116
Chromium	50.0	49.7	D	mg/Kg		99	83 - 119
Copper	50.0	51.2	D	mg/Kg		102	84 - 119
Lead	5.00	5.09	D	mg/Kg		102	84 - 118
Nickel	50.0	51.2	D	mg/Kg		102	84 - 119
Selenium	10.0	10.1	D	mg/Kg		101	80 - 119
Silver	5.00	5.04	D	mg/Kg		101	83 - 118
Zinc	50.0	49.8	D	mg/Kg		100	82 - 119

Lab Sample ID: MB 410-411817/1-A
Matrix: 5 ater
Analysis Batch: 419%1%

Client Sample ID: Method Blank
Prep Type: Total RecoWerable
Prep Batch: 411817

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	0.0017	U	0.0020	0.0017	0.00068	mg/L		08/28/23 18:55	1
Cadmium	0.00040	U	0.00050	0.00040	0.00015	mg/L		08/28/23 18:55	1
Chromium	0.0011	U	0.0020	0.0011	0.00055	mg/L		08/28/23 18:55	1
Copper	0.00090	U	0.0010	0.00090	0.00036	mg/L		08/28/23 18:55	1
Lead	0.00020	U	0.00050	0.00020	0.00012	mg/L		08/28/23 18:55	1
Selenium	0.00060	U	0.0010	0.00060	0.00028	mg/L		08/28/23 18:55	1
Silver	0.00030	U	0.00050	0.00030	0.00010	mg/L		08/28/23 18:55	1
Zinc	0.0080	U	0.015	0.0080	0.0040	mg/L		08/28/23 18:55	1

Lab Sample ID: MB 410-411817/1-A
Matrix: 5 ater
Analysis Batch: 414912

Client Sample ID: Method Blank
Prep Type: Total RecoWerable
Prep Batch: 411817

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	0.0016	U	0.0020	0.0016	0.00075	mg/L		08/30/23 08:24	1
Nickel	0.00080	U	0.0015	0.00080	0.00040	mg/L		08/30/23 08:24	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 410-411817/2-A
Matrix: 5 ater
Analysis Batch: 419%1%

Client Sample ID: Lab Control Sample
Prep Type: Total RecoWerable
Prep Batch: 411817

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
Arsenic	0.500	0.506		mg/L		101	84 - 116
Cadmium	0.0500	0.0515		mg/L		103	87 - 115
Chromium	0.500	0.515		mg/L		103	85 - 116
Copper	0.500	0.519		mg/L		104	85 - 118
Lead	0.0500	0.0521		mg/L		104	88 - 115
Selenium	0.100	0.106		mg/L		106	80 - 120
Silver	0.0500	0.0525		mg/L		105	85 - 116
Zinc	0.500	0.503		mg/L		101	83 - 119

Lab Sample ID: LCS 410-411817/2-A
Matrix: 5 ater
Analysis Batch: 414912

Client Sample ID: Lab Control Sample
Prep Type: Total RecoWerable
Prep Batch: 411817

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
Barium	0.500	0.528		mg/L		106	86 - 114
Nickel	0.500	0.518		mg/L		104	85 - 117

Lab Sample ID: MB 410-41%1%%1-A
Matrix: Solid
Analysis Batch: 416173

Client Sample ID: Method Blank
Prep Type: Total RecoWerable
Prep Batch: 41%1%%

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	17	U	20	17	6.8	ug/L		09/05/23 16:45	1
Barium	16	U	20	16	7.5	ug/L		09/05/23 16:45	1
Cadmium	4.0	U	5.0	4.0	1.5	ug/L		09/05/23 16:45	1
Chromium	11	U	20	11	5.5	ug/L		09/05/23 16:45	1
Lead	2.0	U	5.0	2.0	1.2	ug/L		09/05/23 16:45	1
Selenium	6.0	U	10	6.0	2.8	ug/L		09/05/23 16:45	1
Silver	3.0	U	5.0	3.0	1.0	ug/L		09/05/23 16:45	1

Lab Sample ID: LCS 410-41%1%%2-A
Matrix: Solid
Analysis Batch: 416173

Client Sample ID: Lab Control Sample
Prep Type: Total RecoWerable
Prep Batch: 41%1%%

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
Arsenic	5000	5070		ug/L		101	84 - 116
Barium	5000	5230		ug/L		105	86 - 114
Cadmium	500	525		ug/L		105	87 - 115
Chromium	5000	4990		ug/L		100	85 - 116
Lead	500	512		ug/L		102	88 - 115
Selenium	1000	1030		ug/L		103	80 - 120
Silver	500	516		ug/L		103	85 - 116

Lab Sample ID: MB 410-41%704/1-A
Matrix: Solid
Analysis Batch: 416173

Client Sample ID: Method Blank
Prep Type: Total RecoWerable
Prep Batch: 41%704

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	17	U	20	17	6.8	ug/L		09/05/23 17:48	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 410-41[illegible]704/1-A
Matrix: Solid
Analysis Batch: 416173

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 41[illegible]704

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	16	U	20	16	7.5	ug/L		09/05/23 17:48	1
Cadmium	4.0	U	5.0	4.0	1.5	ug/L		09/05/23 17:48	1
Chromium	11	U	20	11	5.5	ug/L		09/05/23 17:48	1
Lead	2.0	U	5.0	2.0	1.2	ug/L		09/05/23 17:48	1
Selenium	6.0	U	10	6.0	2.8	ug/L		09/05/23 17:48	1
Silver	3.0	U	5.0	3.0	1.0	ug/L		09/05/23 17:48	1

Lab Sample ID: LCS 410-41[illegible]704/2-A
Matrix: Solid
Analysis Batch: 416173

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 41[illegible]704

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
Arsenic	5000	4930		ug/L		99	84 - 116
Barium	5000	5000		ug/L		100	86 - 114
Cadmium	500	499		ug/L		100	87 - 115
Chromium	5000	5030		ug/L		101	85 - 116
Lead	500	501		ug/L		100	88 - 115
Selenium	1000	961		ug/L		96	80 - 120
Silver	500	496		ug/L		99	85 - 116

Lab Sample ID: 410-1936[illegible]7-4 MS
Matrix: Solid
Analysis Batch: 416173

Client Sample ID: NBv v -B76-ID5 02A-SO-081729
Prep Type: TCLP
Prep Batch: 41[illegible]704

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	E Rec	E Rec Limits
Arsenic	17	U *	5000	4930		ug/L		99	84 - 116
Barium	510	B *	5000	5690		ug/L		104	86 - 114
Cadmium	2.4	J *	500	507		ug/L		101	87 - 115
Chromium	11	U *	5000	4910		ug/L		98	85 - 116
Lead	6.0	*	500	502		ug/L		99	88 - 115
Selenium	6.0	U *	1000	986		ug/L		99	80 - 120
Silver	3.0	U *	500	500		ug/L		100	85 - 116

Lab Sample ID: 410-1936[illegible]7-4 MSD
Matrix: Solid
Analysis Batch: 416173

Client Sample ID: NBv v -B76-ID5 02A-SO-081729
Prep Type: TCLP
Prep Batch: 41[illegible]704

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	E Rec	E Rec Limits	RPD	RPD Limit
Arsenic	17	U *	5000	5060		ug/L		101	84 - 116	3	20
Barium	510	B *	5000	5750		ug/L		105	86 - 114	1	20
Cadmium	2.4	J *	500	516		ug/L		103	87 - 115	2	20
Chromium	11	U *	5000	5050		ug/L		101	85 - 116	3	20
Lead	6.0	*	500	506		ug/L		100	88 - 115	1	20
Selenium	6.0	U *	1000	986		ug/L		99	80 - 120	0	20
Silver	3.0	U *	500	507		ug/L		101	85 - 116	2	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 410-1936%7-4 DU
Matrix: Solid
Analysis Batch: 416173

Client Sample ID: NBv v -B76-ID5 02A-SO-081729
Prep Type: TCLP
Prep Batch: 41%704

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	17	U *	17	U	ug/L		NC	20
Barium	510	B *	482		ug/L		5	20
Cadmium	2.4	J *	2.64	J	ug/L		10	20
Chromium	11	U *	11	U	ug/L		NC	20
Lead	6.0	*	5.81		ug/L		4	20
Selenium	6.0	U *	6.0	U	ug/L		NC	20
Silver	3.0	U *	3.0	U	ug/L		NC	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 410-411343/1-A
Matrix: 5 ater
Analysis Batch: 412%88

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 411343

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.16	U	0.20	0.16	0.079	ug/L		08/25/23 10:16	1

Lab Sample ID: LCS 410-411343/2-A
Matrix: 5 ater
Analysis Batch: 412%88

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 411343

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
Mercury	1.00	0.960		ug/L		96	82 - 119

Lab Sample ID: MB 410-41%1%7/1-A
Matrix: Solid
Analysis Batch: 41%424

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 41%1%7

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.16	U	0.20	0.16	0.079	ug/L		09/01/23 14:38	1

Lab Sample ID: LCS 410-41%1%7/2-A
Matrix: Solid
Analysis Batch: 41%424

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 41%1%7

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
Mercury	1.00	1.04		ug/L		104	82 - 119

Lab Sample ID: MB 410-41%706/1-A
Matrix: Solid
Analysis Batch: 41%3%1

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 41%706

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.16	U	0.20	0.16	0.079	ug/L		09/05/23 11:14	1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 410-41[illegible]706/2-A
Matrix: Solid
Analysis Batch: 41[illegible]3[illegible]1

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 41[illegible]706

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits		
Mercury			1.00	1.06		ug/L		106	82 - 119		

Lab Sample ID: 410-1936[illegible]7-4 MS
Matrix: Solid
Analysis Batch: 41[illegible]3[illegible]1

Client Sample ID: NBv v -B76-ID5 02A-SO-081729
Prep Type: TCLP
Prep Batch: 41[illegible]706

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	E Rec	E Rec Limits		
Mercury	0.16	U	1.00	1.02		ug/L		102	82 - 119		

Lab Sample ID: 410-1936[illegible]7-4 MSD
Matrix: Solid
Analysis Batch: 41[illegible]3[illegible]1

Client Sample ID: NBv v -B76-ID5 02A-SO-081729
Prep Type: TCLP
Prep Batch: 41[illegible]706

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	E Rec	E Rec Limits	RPD	RPD Limit
Mercury	0.16	U	1.00	1.01		ug/L		101	82 - 119	1	20

Lab Sample ID: 410-1936[illegible]7-4 DU
Matrix: Solid
Analysis Batch: 41[illegible]3[illegible]1

Client Sample ID: NBv v -B76-ID5 02A-SO-081729
Prep Type: TCLP
Prep Batch: 41[illegible]706

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	0.16	U	0.16	U	ug/L		NC	20

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 410-410974/1-A
Matrix: Solid
Analysis Batch: 410[illegible]27

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 410974

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.024	U	0.036	0.024	0.012	mg/Kg		08/21/23 08:55	1

Lab Sample ID: LCS 410-410974/2-A
Matrix: Solid
Analysis Batch: 410[illegible]27

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 410974

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits		
Mercury			0.100	0.107		mg/Kg		107	80 - 124		

Method: 1010A - Ignitability, Pensky-Martens Closed-Cup Method

Lab Sample ID: LCS 410-414124/1
Matrix: Solid
Analysis Batch: 414124

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits		
Flashpoint			81.0	81.00		Degrees F		100	96.9 - 103.1		

Method: 1010A - Ignitability, Pensky-Martens Closed-Cup Method (Continued)

Lab Sample ID: LCSD 410-414124/2
Matrix: Solid
Analysis Batch: 414124

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	E Rec	E Rec Limits	RPD	RPD Limit
Flashpoint	81.0	82.00		Degrees F		101	96.9 - 103.1	1	4

Method: 3012 - Cyanide, Reactive

Lab Sample ID: MB 410-414678/1-A
Matrix: Solid
Analysis Batch: 414708

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 414678

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cyanide, Reactive	50	U	60	50	20	mg/Kg		09/01/23 17:49	1

Lab Sample ID: LCS 410-414678/2-A
Matrix: Solid
Analysis Batch: 414708

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 414678

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
Cyanide, Reactive	1000	50	U	mg/Kg		-0.008	0 - 5.14

Method: 3094 - Sulfide, Reactive

Lab Sample ID: MB 410-414678/1-A
Matrix: Solid
Analysis Batch: 414309

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 414678

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Sulfide, Reactive	140	U	160	140	54	mg/Kg		08/31/23 12:50	1

Lab Sample ID: LCS 410-414678/2-A
Matrix: Solid
Analysis Batch: 414309

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 414678

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
Sulfide, Reactive	538	415		mg/Kg		77	62 - 104

Method: 3040C - pH

Lab Sample ID: LCS 410-412921/1
Matrix: Water
Analysis Batch: 412921

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	E Rec	E Rec Limits
pH	7.00	7.0		S.U.		99	95 - 105

GC/MS eVA

OPacp Batcph: 3: 316

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	TCLP	Solid	1311	
410-139657-4	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	1311	
410-139657-3 MS	NBKK-B76-IDW01A-SO-081723	TCLP	Solid	1311	

Analysis Batcph: 31d85

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	TCLP	Solid	8260D	414195
410-139657-4	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	8260D	414195
MB 410-419687/9	Method Blank	Total/NA	Solid	8260D	
LCS 410-419687/5	Lab Control Sample	Total/NA	Solid	8260D	
410-139657-3 MS	NBKK-B76-IDW01A-SO-081723	TCLP	Solid	8260D	414195

GC/MS SPmi eVA

I rP4 Batcph: 33: 36

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	3510C	
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total/NA	Water	3510C	
MB 410-411415/1-A	Method Blank	Total/NA	Water	3510C	
LCS 410-411415/2-A	Lab Control Sample	Total/NA	Water	3510C	

Analysis Batcph: 33813

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	8270E SIM	411415
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total/NA	Water	8270E SIM	411415
MB 410-411415/1-A	Method Blank	Total/NA	Water	8270E SIM	411415
LCS 410-411415/2-A	Lab Control Sample	Total/NA	Water	8270E SIM	411415

I rP4 Batcph: 32338

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3 - RE	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	3546	
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	3546	
MB 410-413118/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-413118/2-A	Lab Control Sample	Total/NA	Solid	3546	
LCSD 410-413118/3-A	Lab Control Sample Dup	Total/NA	Solid	3546	

Analysis Batcph: 3: 081

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3 - RE	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	8270E SIM	413118
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	8270E SIM	413118
MB 410-413118/1-A	Method Blank	Total/NA	Solid	8270E SIM	413118
LCS 410-413118/2-A	Lab Control Sample	Total/NA	Solid	8270E SIM	413118
LCSD 410-413118/3-A	Lab Control Sample Dup	Total/NA	Solid	8270E SIM	413118

OPacp Batcph: 3: 9d3

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	TCLP	Solid	1311	
410-139657-4	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	1311	

GC/MS SPmi eVA

I rP4 Batcph: 3: 185

Oa7 Sam4LP ld	CLiPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	3546	
MB 410-414987/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-414987/2-A	Lab Control Sample	Total/NA	Solid	3546	

Analysis Batcph: 36391

Oa7 Sam4LP ld	CLiPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	8270E SIM	414987
MB 410-414987/1-A	Method Blank	Total/NA	Solid	8270E SIM	414987
LCS 410-414987/2-A	Lab Control Sample	Total/NA	Solid	8270E SIM	414987

I rP4 Batcph: 36: 3d

Oa7 Sam4LP ld	CLiPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-4	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	3510C	414261
MB 410-415416/1-A	Method Blank	Total/NA	Solid	3510C	
LCS 410-415416/2-A	Lab Control Sample	Total/NA	Solid	3510C	
LCSD 410-415416/3-A	Lab Control Sample Dup	Total/NA	Solid	3510C	

Analysis Batcph: 36: d:

Oa7 Sam4LP ld	CLiPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-4	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	8270E	415416
MB 410-415416/1-A	Method Blank	Total/NA	Solid	8270E	415416
LCS 410-415416/2-A	Lab Control Sample	Total/NA	Solid	8270E	415416
LCSD 410-415416/3-A	Lab Control Sample Dup	Total/NA	Solid	8270E	415416

I rP4 Batcph: 36861

Oa7 Sam4LP ld	CLiPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	TCLP	Solid	3510C	414261
MB 410-415859/1-A	Method Blank	Total/NA	Solid	3510C	
LCS 410-415859/2-A	Lab Control Sample	Total/NA	Solid	3510C	
LCSD 410-415859/3-A	Lab Control Sample Dup	Total/NA	Solid	3510C	

Analysis Batcph: 3d3d8

Oa7 Sam4LP ld	CLiPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	TCLP	Solid	8270E	415859
MB 410-415859/1-A	Method Blank	Total/NA	Solid	8270E	415859
LCS 410-415859/2-A	Lab Control Sample	Total/NA	Solid	8270E	415859
LCSD 410-415859/3-A	Lab Control Sample Dup	Total/NA	Solid	8270E	415859

GC eVA

I rP4 Batcph: 30d95

Oa7 Sam4LP ld	CLiPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	5035	
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	5035	

Analysis Batcph: 330: 8

Oa7 Sam4LP ld	CLiPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	NWTPH-Gx	410627
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	NWTPH-Gx	410627
MB 410-411048/5	Method Blank	Total/NA	Solid	NWTPH-Gx	
LCS 410-411048/6	Lab Control Sample	Total/NA	Solid	NWTPH-Gx	

GC eVA (ContinuPx)

Analysis Batcph: 330: 8 (ContinuPx)

Oa7 Sam4LP ti	CLiPnt Sam4LP ti	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
LCSD 410-411048/7	Lab Control Sample Dup	Total/NA	Solid	NWTPH-Gx	

Analysis Batcph: 33963

Oa7 Sam4LP ti	CLiPnt Sam4LP ti	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	NWTPH-Gx	
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total/NA	Water	NWTPH-Gx	
MB 410-411251/5	Method Blank	Total/NA	Water	NWTPH-Gx	
LCS 410-411251/6	Lab Control Sample	Total/NA	Water	NWTPH-Gx	
LCSD 410-411251/7	Lab Control Sample Dup	Total/NA	Water	NWTPH-Gx	

Analysis Batcph: 33dd6

Oa7 Sam4LP ti	CLiPnt Sam4LP ti	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	NWTPH-Gx	
MB 410-411665/7	Method Blank	Total/NA	Water	NWTPH-Gx	
LCS 410-411665/8	Lab Control Sample	Total/NA	Water	NWTPH-Gx	
LCSD 410-411665/9	Lab Control Sample Dup	Total/NA	Water	NWTPH-Gx	

Analysis Batcph: 33155

Oa7 Sam4LP ti	CLiPnt Sam4LP ti	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	NWTPH-Gx	410627
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	NWTPH-Gx	410627
MB 410-411977/5	Method Blank	Total/NA	Solid	NWTPH-Gx	
LCS 410-411977/6	Lab Control Sample	Total/NA	Solid	NWTPH-Gx	
LCSD 410-411977/7	Lab Control Sample Dup	Total/NA	Solid	NWTPH-Gx	

GC SPmi eVA

I rP4 Batcph: 33221

Oa7 Sam4LP ti	CLiPnt Sam4LP ti	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	3550C	
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	3550C	
MB 410-411339/1-A	Method Blank	Total/NA	Solid	3550C	
LCS 410-411339/2-A	Lab Control Sample	Total/NA	Solid	3550C	
410-139657-3 MS	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	3550C	
410-139657-3 MSD	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	3550C	

I rP4 Batcph: 39: 3:

Oa7 Sam4LP ti	CLiPnt Sam4LP ti	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	3546	
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	3546	
MB 410-412414/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-412414/2-A	Lab Control Sample	Total/NA	Solid	3546	

Analysis Batcph: 3955d

Oa7 Sam4LP ti	CLiPnt Sam4LP ti	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
MB 410-412414/1-A	Method Blank	Total/NA	Solid	8082A	412414
LCS 410-412414/2-A	Lab Control Sample	Total/NA	Solid	8082A	412414

Analysis Batcph: 32666

Oa7 Sam4LP ti	CLiPnt Sam4LP ti	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	NWTPH-Dx	411339

GC SPmi eVA (ContinuPx)

Analysis Batcph: 32666 (ContinuPx)

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	NWTPH-Dx	411339
MB 410-411339/1-A	Method Blank	Total/NA	Solid	NWTPH-Dx	411339
LCS 410-411339/2-A	Lab Control Sample	Total/NA	Solid	NWTPH-Dx	411339
410-139657-3 MS	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	NWTPH-Dx	411339
410-139657-3 MSD	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	NWTPH-Dx	411339

I rP4 Batcph: 3: 3: 0

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	3510C	
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total/NA	Water	3510C	
MB 410-414140/1-A	Method Blank	Total/NA	Water	3510C	
LCS 410-414140/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 410-414140/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batcph: 3: dd:

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	8082A	414140
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total/NA	Water	8082A	414140
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	8082A	412414
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	8082A	412414
MB 410-414140/1-A	Method Blank	Total/NA	Water	8082A	414140
LCS 410-414140/2-A	Lab Control Sample	Total/NA	Water	8082A	414140
LCSD 410-414140/3-A	Lab Control Sample Dup	Total/NA	Water	8082A	414140

I rP4 Batcph: 3: 150

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	3510C	
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total/NA	Water	3510C	
MB 410-414970/1-A	Method Blank	Total/NA	Water	3510C	
LCS 410-414970/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 410-414970/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	
410-139657-1 DU	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	3510C	

Analysis Batcph: 36100

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	NWTPH-Dx	414970
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total/NA	Water	NWTPH-Dx	414970
MB 410-414970/1-A	Method Blank	Total/NA	Water	NWTPH-Dx	414970
LCS 410-414970/2-A	Lab Control Sample	Total/NA	Water	NWTPH-Dx	414970
LCSD 410-414970/3-A	Lab Control Sample Dup	Total/NA	Water	NWTPH-Dx	414970
410-139657-1 DU	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	NWTPH-Dx	414970

MPtals

I rP4 Batcph: 302d8

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	3050B	
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	3050B	
MB 410-410368/1-A	Method Blank	Total/NA	Solid	3050B	
MB 410-410368/1-A ^2	Method Blank	Total/NA	Solid	3050B	
LCS 410-410368/2-A	Lab Control Sample	Total/NA	Solid	3050B	

MPtals (ContinuPx)

I rP4 Batcph: 302d8 (ContinuPx)

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
LCS 410-410368/2-A ^2	Lab Control Sample	Total/NA	Solid	3050B	

I rP4 Batcph: 3025:

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	7471B	
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	7471B	
MB 410-410374/1-A	Method Blank	Total/NA	Solid	7471B	
LCS 410-410374/2-A	Lab Control Sample	Total/NA	Solid	7471B	

Analysis Batcph: 30695

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	7471B	410374
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	7471B	410374
MB 410-410374/1-A	Method Blank	Total/NA	Solid	7471B	410374
LCS 410-410374/2-A	Lab Control Sample	Total/NA	Solid	7471B	410374

I rP4 Batcph: 33835

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total Recoverable	Water	3005A	
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total Recoverable	Water	3005A	
MB 410-411817/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-411817/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

I rP4 Batcph: 331: 1

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	7470A	
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total/NA	Water	7470A	
MB 410-411949/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-411949/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batcph: 39688

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	7470A	411949
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total/NA	Water	7470A	411949
MB 410-411949/1-A	Method Blank	Total/NA	Water	7470A	411949
LCS 410-411949/2-A	Lab Control Sample	Total/NA	Water	7470A	411949

Analysis Batcph: 32636

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total Recoverable	Water	6020B	411817
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total Recoverable	Water	6020B	411817
MB 410-411817/1-A	Method Blank	Total Recoverable	Water	6020B	411817
LCS 410-411817/2-A	Lab Control Sample	Total Recoverable	Water	6020B	411817

OPacp Batcph: 3: 9d3

Oa7 Sam4LP ld	CliPnt Sam4LP ld	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	TCLP	Solid	1311	
410-139657-4	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	1311	
410-139657-4 MS	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	1311	
410-139657-4 MSD	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	1311	
410-139657-4 DU	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	1311	

MPtals

Analysis Batcph: 3: 239

Oa7 Sam4lP lb	CliPnt Sam4lP lb	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total Recoverable	Water	6020B	411817
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total Recoverable	Water	6020B	411817
MB 410-411817/1-A	Method Blank	Total Recoverable	Water	6020B	411817
LCS 410-411817/2-A	Lab Control Sample	Total Recoverable	Water	6020B	411817

Analysis Batcph: 3: 882

Oa7 Sam4lP lb	CliPnt Sam4lP lb	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	6020B	410368
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	6020B	410368
MB 410-410368/1-A ^2	Method Blank	Total/NA	Solid	6020B	410368
LCS 410-410368/2-A ^2	Lab Control Sample	Total/NA	Solid	6020B	410368

I rP4 Batcph: 36366

Oa7 Sam4lP lb	CliPnt Sam4lP lb	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	TCLP	Solid	3005A	414261
MB 410-415155/1-A	Method Blank	Total Recoverable	Solid	3005A	
LCS 410-415155/2-A	Lab Control Sample	Total Recoverable	Solid	3005A	

I rP4 Batcph: 36365

Oa7 Sam4lP lb	CliPnt Sam4lP lb	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	TCLP	Solid	7470A	414261
MB 410-415157/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 410-415157/2-A	Lab Control Sample	Total/NA	Solid	7470A	

Analysis Batcph: 36: 9:

Oa7 Sam4lP lb	CliPnt Sam4lP lb	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	TCLP	Solid	7470A	415157
MB 410-415157/1-A	Method Blank	Total/NA	Solid	7470A	415157
LCS 410-415157/2-A	Lab Control Sample	Total/NA	Solid	7470A	415157

I rP4 Batcph: 3650:

Oa7 Sam4lP lb	CliPnt Sam4lP lb	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-4	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	3005A	414261
MB 410-415704/1-A	Method Blank	Total Recoverable	Solid	3005A	
LCS 410-415704/2-A	Lab Control Sample	Total Recoverable	Solid	3005A	
410-139657-4 MS	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	3005A	414261
410-139657-4 MSD	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	3005A	414261
410-139657-4 DU	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	3005A	414261

I rP4 Batcph: 3650d

Oa7 Sam4lP lb	CliPnt Sam4lP lb	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-4	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	7470A	414261
MB 410-415706/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 410-415706/2-A	Lab Control Sample	Total/NA	Solid	7470A	
410-139657-4 MS	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	7470A	414261
410-139657-4 MSD	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	7470A	414261
410-139657-4 DU	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	7470A	414261

Analysis Batcph: 36163

Oa7 Sam4lP lb	CliPnt Sam4lP lb	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-4	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	7470A	415706

MPtals (ContinuPx)

Analysis Batcph: 36163 (ContinuPx)

Oa7 Sam4lP lb	CliPnt Sam4lP lb	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
MB 410-415706/1-A	Method Blank	Total/NA	Solid	7470A	415706
LCS 410-415706/2-A	Lab Control Sample	Total/NA	Solid	7470A	415706
410-139657-4 MS	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	7470A	415706
410-139657-4 MSD	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	7470A	415706
410-139657-4 DU	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	7470A	415706

Analysis Batcph: 3d351

Oa7 Sam4lP lb	CliPnt Sam4lP lb	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	TCLP	Solid	6020B	415155
410-139657-4	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	6020B	415704
MB 410-415155/1-A	Method Blank	Total Recoverable	Solid	6020B	415155
MB 410-415704/1-A	Method Blank	Total Recoverable	Solid	6020B	415704
LCS 410-415155/2-A	Lab Control Sample	Total Recoverable	Solid	6020B	415155
LCS 410-415704/2-A	Lab Control Sample	Total Recoverable	Solid	6020B	415704
410-139657-4 MS	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	6020B	415704
410-139657-4 MSD	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	6020B	415704
410-139657-4 DU	NBKK-B76-IDW02A-SO-081723	TCLP	Solid	6020B	415704

Analysis Batcph: 35591

Oa7 Sam4lP lb	CliPnt Sam4lP lb	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	6020B	410368
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	6020B	410368
MB 410-410368/1-A	Method Blank	Total/NA	Solid	6020B	410368
LCS 410-410368/2-A	Lab Control Sample	Total/NA	Solid	6020B	410368

GPnPraLCpPmistry

Analysis Batcph: 309d:

Oa7 Sam4lP lb	CliPnt Sam4lP lb	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	Moisture	
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	Moisture	

Analysis Batcph: 39293

Oa7 Sam4lP lb	CliPnt Sam4lP lb	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	9040C	
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total/NA	Water	9040C	
LCS 410-412321/1	Lab Control Sample	Total/NA	Water	9040C	

Analysis Batcph: 3: 39:

Oa7 Sam4lP lb	CliPnt Sam4lP lb	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	1010A	
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total/NA	Water	1010A	
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	1010A	
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	1010A	
LCS 410-414124/1	Lab Control Sample	Total/NA	Solid	1010A	
LCSD 410-414124/2	Lab Control Sample Dup	Total/NA	Solid	1010A	

I rP4 Batcph: 3: d68

Oa7 Sam4lP lb	CliPnt Sam4lP lb	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	7.3.4	
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total/NA	Water	7.3.4	

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-139657-1
SDG: 410-139657

GPnPraLCpPmistry (ContinuPx)

I rP4 Batcph: 3: d68 (ContinuPx)

Oa7 Sam4LP b	CLiPnt Sam4LP b	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	7.3.4	
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	7.3.4	
MB 410-414658/1-A	Method Blank	Total/NA	Solid	7.3.4	
LCS 410-414658/25-A	Lab Control Sample	Total/NA	Solid	7.3.4	
LCS 410-414658/2-A	Lab Control Sample	Total/NA	Solid	7.3.4	

Analysis Batcph: 3: 102

Oa7 Sam4LP b	CLiPnt Sam4LP b	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	9034	414658
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total/NA	Water	9034	414658
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	9034	414658
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	9034	414658
MB 410-414658/1-A	Method Blank	Total/NA	Solid	9034	414658
LCS 410-414658/25-A	Lab Control Sample	Total/NA	Solid	9034	414658

Analysis Batcph: 36108

Oa7 Sam4LP b	CLiPnt Sam4LP b	I rP4 Dy4P	MatriT	MPtpox	I rP4 Batcp
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Total/NA	Water	9012	414658
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Total/NA	Water	9012	414658
410-139657-3	NBKK-B76-IDW01A-SO-081723	Total/NA	Solid	9012	414658
410-139657-4	NBKK-B76-IDW02A-SO-081723	Total/NA	Solid	9012	414658
MB 410-414658/1-A	Method Blank	Total/NA	Solid	9012	414658
LCS 410-414658/2-A	Lab Control Sample	Total/NA	Solid	9012	414658

Client Sample ID: NBKK-B76-IDW01A-AQ-081723

Lab Sample ID: 410-139657-1

Date Collected: 08/17/23 16:47

Matrix: Water

Date Received: 08/19/23 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			411415	QKX3	ELLE	08/23/23 07:52
Total/NA	Analysis	8270E SIM		1	411891	UJM0	ELLE	08/24/23 09:23
Total/NA	Analysis	NWTPH-Gx		1	411251	MDQ6	ELLE	08/23/23 05:09
Total/NA	Analysis	NWTPH-Gx		1	411665	MDQ6	ELLE	08/24/23 07:50
Total/NA	Prep	3510C			414140	QKX3	ELLE	08/30/23 07:53
Total/NA	Analysis	8082A		1	414664	A2VL	ELLE	08/31/23 14:17
Total/NA	Prep	3510C			414970	T9CY	ELLE	08/31/23 15:24
Total/NA	Analysis	NWTPH-Dx		1	415900	KP5X	ELLE	09/05/23 15:49
Total Recoverable	Prep	3005A			411817	HUH3	ELLE	08/24/23 00:56
Total Recoverable	Analysis	6020B		1	413515	UCIG	ELLE	08/28/23 20:25
Total Recoverable	Prep	3005A			411817	HUH3	ELLE	08/24/23 00:56
Total Recoverable	Analysis	6020B		1	414312	F7JF	ELLE	08/30/23 08:36
Total/NA	Prep	7470A			411949	HUH3	ELLE	08/24/23 08:23
Total/NA	Analysis	7470A		1	412588	UEFS	ELLE	08/25/23 10:40
Total/NA	Analysis	1010A		1	414124	USAE	ELLE	08/30/23 07:33 - 08/30/23 07:33 [1]
Total/NA	Prep	7.3.4			414658	USE1	ELLE	08/31/23 07:57
Total/NA	Analysis	9012		1	415908	UJE2	ELLE	09/01/23 17:53
Total/NA	Prep	7.3.4			414658	USE1	ELLE	08/31/23 07:57
Total/NA	Analysis	9034		1	414903	USE1	ELLE	08/31/23 12:50
Total/NA	Analysis	9040C		1	412321	DI9Q	ELLE	08/24/23 22:55

Client Sample ID: NBKK-B76-IDW02A-AQ-081723

Lab Sample ID: 410-139657-2

Date Collected: 08/17/23 17:02

Matrix: Water

Date Received: 08/19/23 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			411415	QKX3	ELLE	08/23/23 07:52
Total/NA	Analysis	8270E SIM		1	411891	UJM0	ELLE	08/24/23 09:44
Total/NA	Analysis	NWTPH-Gx		1	411251	MDQ6	ELLE	08/23/23 05:35
Total/NA	Prep	3510C			414140	QKX3	ELLE	08/30/23 07:53
Total/NA	Analysis	8082A		1	414664	A2VL	ELLE	08/31/23 14:28
Total/NA	Prep	3510C			414970	T9CY	ELLE	08/31/23 15:24
Total/NA	Analysis	NWTPH-Dx		1	415900	KP5X	ELLE	09/05/23 15:27
Total Recoverable	Prep	3005A			411817	HUH3	ELLE	08/24/23 00:56
Total Recoverable	Analysis	6020B		1	413515	UCIG	ELLE	08/28/23 20:23
Total Recoverable	Prep	3005A			411817	HUH3	ELLE	08/24/23 00:56
Total Recoverable	Analysis	6020B		1	414312	F7JF	ELLE	08/30/23 08:34
Total/NA	Prep	7470A			411949	HUH3	ELLE	08/24/23 08:23
Total/NA	Analysis	7470A		1	412588	UEFS	ELLE	08/25/23 10:42
Total/NA	Analysis	1010A		1	414124	USAE	ELLE	08/30/23 07:33 - 08/30/23 07:33 [1]
Total/NA	Prep	7.3.4			414658	USE1	ELLE	08/31/23 07:57
Total/NA	Analysis	9012		1	415908	UJE2	ELLE	09/01/23 17:40
Total/NA	Prep	7.3.4			414658	USE1	ELLE	08/31/23 07:57
Total/NA	Analysis	9034		1	414903	USE1	ELLE	08/31/23 12:50

Lab Chronicle

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-139657-1
SDG: 410-139657

Client Sample ID: NBKK-B76-IDW02A-AQ-081723
Date Collected: 08/17/23 17:02
Date Received: 08/19/23 09:50

Lab Sample ID: 410-139657-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9040C		1	412321	DI9Q	ELLE	08/24/23 22:55

Client Sample ID: NBKK-B76-IDW01A-SO-081723
Date Collected: 08/17/23 17:10
Date Received: 08/19/23 09:50

Lab Sample ID: 410-139657-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			414195	UNWS	ELLE	08/31/23 16:00 - 09/01/23 09:00 [1]
TCLP	Analysis	8260D		20	419687	K4WN	ELLE	09/15/23 07:38
TCLP	Leach	1311			414261	UNWS	ELLE	08/30/23 17:45 - 08/31/23 09:50 [1]
TCLP	Prep	3510C			415859	YDF5	ELLE	09/05/23 08:38
TCLP	Analysis	8270E		1	416168	SJ89	ELLE	09/06/23 01:31
TCLP	Leach	1311			414261	UNWS	ELLE	08/30/23 17:45 - 08/31/23 09:50 [1]
TCLP	Prep	3005A			415155	HUH3	ELLE	09/01/23 07:15
TCLP	Analysis	6020B		1	416179	UCIG	ELLE	09/05/23 17:32
TCLP	Leach	1311			414261	UNWS	ELLE	08/30/23 17:45 - 08/31/23 09:50 [1]
TCLP	Prep	7470A			415157	HUH3	ELLE	09/01/23 07:31
TCLP	Analysis	7470A		1	415424	UEFS	ELLE	09/01/23 15:35
Total/NA	Analysis	1010A		1	414124	USAE	ELLE	08/30/23 07:33 - 08/30/23 07:33 [1]
Total/NA	Prep	7.3.4			414658	USE1	ELLE	08/31/23 07:57
Total/NA	Analysis	9012		1	415908	UJE2	ELLE	09/01/23 17:54
Total/NA	Prep	7.3.4			414658	USE1	ELLE	08/31/23 07:57
Total/NA	Analysis	9034		1	414903	USE1	ELLE	08/31/23 12:50
Total/NA	Analysis	Moisture		1	410264	K9VH	ELLE	08/19/23 14:38

Client Sample ID: NBKK-B76-IDW01A-SO-081723
Date Collected: 08/17/23 17:10
Date Received: 08/19/23 09:50

Lab Sample ID: 410-139657-3
Matrix: Solid
Percent Solids: 87.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546	RE		413118	LJG2	ELLE	08/28/23 09:11
Total/NA	Analysis	8270E SIM	RE	1	414089	UJM0	ELLE	08/30/23 11:29
Total/NA	Prep	3546			414987	ZB3H	ELLE	08/31/23 16:25
Total/NA	Analysis	8270E SIM		1	415129	UJM0	ELLE	09/01/23 07:05
Total/NA	Prep	5035			410627	D8NM	ELLE	08/21/23 20:27
Total/NA	Analysis	NWTPH-Gx		25	411048	WJ7F	ELLE	08/22/23 18:28
Total/NA	Prep	5035			410627	D8NM	ELLE	08/21/23 20:27
Total/NA	Analysis	NWTPH-Gx		200	411977	WJ7F	ELLE	08/24/23 17:06
Total/NA	Prep	3546			412414	LJG2	ELLE	08/25/23 09:07
Total/NA	Analysis	8082A		1	414664	A2VL	ELLE	08/31/23 11:56
Total/NA	Prep	3550C			411339	USL7	ELLE	08/23/23 03:10
Total/NA	Analysis	NWTPH-Dx		1	413555	IUSB	ELLE	08/26/23 03:33
Total/NA	Prep	3050B			410368	UAMX	ELLE	08/20/23 21:00
Total/NA	Analysis	6020B		2	414883	F7JF	ELLE	08/31/23 11:01

Client Sample ID: NBKK-B76-IDW01A-SO-081723

Lab Sample ID: 410-139657-3

Date Collected: 08/17/23 17:10
Matrix: Solid
Date Received: 08/19/23 09:50
Percent Solids: 87.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3050B			410368	UAMX	ELLE	08/20/23 21:00
Total/NA	Analysis	6020B		2	417729	LC3M	ELLE	09/09/23 12:23
Total/NA	Prep	7471B			410374	UAMX	ELLE	08/21/23 00:14
Total/NA	Analysis	7471B		1	410527	UEFS	ELLE	08/21/23 09:22

Client Sample ID: NBKK-B76-IDW02A-SO-081723

Lab Sample ID: 410-139657-4

Date Collected: 08/17/23 17:13
Matrix: Solid
Date Received: 08/19/23 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			414195	UNWS	ELLE	08/31/23 16:00 - 09/01/23 09:00 [1]
TCLP	Analysis	8260D		20	419687	K4WN	ELLE	09/15/23 08:22
TCLP	Leach	1311			414261	UNWS	ELLE	08/30/23 17:45 - 08/31/23 09:50 [1]
TCLP	Prep	3510C			415416	T9CY	ELLE	09/01/23 15:27
TCLP	Analysis	8270E		1	415464	GLQ9	ELLE	09/02/23 01:57
TCLP	Leach	1311			414261	UNWS	ELLE	08/30/23 17:45 - 08/31/23 09:50 [1]
TCLP	Prep	3005A			415704	UAMX	ELLE	09/04/23 19:10
TCLP	Analysis	6020B		1	416179	UCIG	ELLE	09/05/23 17:58
TCLP	Leach	1311			414261	UNWS	ELLE	08/30/23 17:45 - 08/31/23 09:50 [1]
TCLP	Prep	7470A			415706	UAMX	ELLE	09/04/23 19:19
TCLP	Analysis	7470A		1	415951	UEFS	ELLE	09/05/23 09:30
Total/NA	Analysis	1010A		1	414124	USAE	ELLE	08/30/23 07:33 - 08/30/23 07:33 [1]
Total/NA	Prep	7.3.4			414658	USE1	ELLE	08/31/23 07:57
Total/NA	Analysis	9012		1	415908	UJE2	ELLE	09/01/23 17:54
Total/NA	Prep	7.3.4			414658	USE1	ELLE	08/31/23 07:57
Total/NA	Analysis	9034		1	414903	USE1	ELLE	08/31/23 12:50
Total/NA	Analysis	Moisture		1	410264	K9VH	ELLE	08/19/23 14:38

Client Sample ID: NBKK-B76-IDW02A-SO-081723

Lab Sample ID: 410-139657-4

Date Collected: 08/17/23 17:13
Matrix: Solid
Date Received: 08/19/23 09:50
Percent Solids: 76.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			413118	LJG2	ELLE	08/28/23 09:11
Total/NA	Analysis	8270E SIM		1	414089	UJM0	ELLE	08/30/23 11:53
Total/NA	Prep	5035			410627	D8NM	ELLE	08/21/23 20:27
Total/NA	Analysis	NWTPH-Gx		1000	411048	WJ7F	ELLE	08/22/23 19:10
Total/NA	Prep	5035			410627	D8NM	ELLE	08/21/23 20:27
Total/NA	Analysis	NWTPH-Gx		1000	411977	WJ7F	ELLE	08/24/23 17:42
Total/NA	Prep	3546			412414	LJG2	ELLE	08/25/23 09:07
Total/NA	Analysis	8082A		1	414664	A2VL	ELLE	08/31/23 12:07
Total/NA	Prep	3550C			411339	USL7	ELLE	08/23/23 03:10
Total/NA	Analysis	NWTPH-Dx		1	413555	IUSB	ELLE	08/26/23 03:11
Total/NA	Prep	3050B			410368	UAMX	ELLE	08/20/23 21:00
Total/NA	Analysis	6020B		2	414883	F7JF	ELLE	08/31/23 11:05

Lab Chronicle

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-139657-1
SDG: 410-139657

Client Sample ID: NBKK-B76-IDW02A-SO-081723

Date Collected: 08/17/23 17:13
Date Received: 08/19/23 09:50

Lab Sample ID: 410-139657-4

Matrix: Solid
Percent Solids: 76.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3050B			410368	UAMX	ELLE	08/20/23 21:00
Total/NA	Analysis	6020B		2	417729	LC3M	ELLE	09/09/23 12:25
Total/NA	Prep	7471B			410374	UAMX	ELLE	08/21/23 00:14
Total/NA	Analysis	7471B		1	410527	UEFS	ELLE	08/21/23 09:24

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

ALS MTown = ALS Environmental - Middletown, PA, 301 Fulling Mill Road, Middletown, PA 17057

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-139657-1
SDG: 410-139657

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
9034	7.3.4	Water	Sulfide, Reactive
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Washington	State		C457	04-11-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
8270E SIM	3510C	Water	1-Methylnaphthalene
8270E SIM	3510C	Water	2-Methylnaphthalene
8270E SIM	3510C	Water	Acenaphthene
8270E SIM	3510C	Water	Acenaphthylene
8270E SIM	3510C	Water	Anthracene
8270E SIM	3510C	Water	Benzo[a]anthracene
8270E SIM	3510C	Water	Benzo[a]pyrene
8270E SIM	3510C	Water	Benzo[b]fluoranthene
8270E SIM	3510C	Water	Benzo[g,h,i]perylene
8270E SIM	3510C	Water	Benzo[k]fluoranthene
8270E SIM	3510C	Water	Chrysene
8270E SIM	3510C	Water	Dibenz(a,h)anthracene
8270E SIM	3510C	Water	Fluoranthene
8270E SIM	3510C	Water	Fluorene
8270E SIM	3510C	Water	Indeno[1,2,3-cd]pyrene
8270E SIM	3510C	Water	Naphthalene
8270E SIM	3510C	Water	Phenanthrene
8270E SIM	3510C	Water	Pyrene
8270E SIM	3546	Solid	1-Methylnaphthalene
8270E SIM	3546	Solid	2-Methylnaphthalene
8270E SIM	3546	Solid	Acenaphthene
8270E SIM	3546	Solid	Acenaphthylene
8270E SIM	3546	Solid	Anthracene
8270E SIM	3546	Solid	Benzo[a]anthracene
8270E SIM	3546	Solid	Benzo[a]pyrene
8270E SIM	3546	Solid	Benzo[b]fluoranthene
8270E SIM	3546	Solid	Benzo[g,h,i]perylene
8270E SIM	3546	Solid	Benzo[k]fluoranthene
8270E SIM	3546	Solid	Chrysene
8270E SIM	3546	Solid	Dibenz(a,h)anthracene
8270E SIM	3546	Solid	Fluoranthene
8270E SIM	3546	Solid	Fluorene
8270E SIM	3546	Solid	Indeno[1,2,3-cd]pyrene
8270E SIM	3546	Solid	Naphthalene
8270E SIM	3546	Solid	Phenanthrene
8270E SIM	3546	Solid	Pyrene
9012	7.3.4	Solid	Cyanide, Reactive
9012	7.3.4	Water	Cyanide, Reactive

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-139657-1
SDG: 410-139657

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
9034	7.3.4	Solid	Sulfide, Reactive
9034	7.3.4	Water	Sulfide, Reactive
9040C		Water	Corrosivity
9040C		Water	pH
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Method Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-139657-1
SDG: 410-139657

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds (GC/MS)	SW846	ELLE
8270E	Semivolatile Organic Compounds (GC/MS)	SW846	ELLE
8270E SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	ELLE
NWTPH-Gx	Northwest - Volatile Petroleum Products (GC)	NWTPH	ELLE
8082A	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	SW846	ELLE
NWTPH-Dx	Northwest - Semi-Volatile Petroleum Products (GC)	NWTPH	ELLE
6020B	Metals (ICP/MS)	SW846	ELLE
7470A	Mercury (CVAA)	SW846	ELLE
7471B	Mercury (CVAA)	SW846	ELLE
1010A	Ignitability, Pensky-Martens Closed-Cup Method	SW846	ELLE
9012	Cyanide, Reactive	SW846	ELLE
9034	Sulfide, Reactive	SW846	ELLE
9040C	pH	SW846	ELLE
Moisture	Percent Moisture	EPA	ELLE
9020B	EPA 9020B TOX	SW846	ALS MTown
9023	Extractable Organic Halides (EOX) in Solids	SW846	ALS MTown
1311	TCLP Extraction	SW846	ELLE
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	ELLE
3050B	Preparation, Metals	SW846	ELLE
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	ELLE
3546	Microwave Extraction	SW846	ELLE
3550C	Ultrasonic Extraction	SW846	ELLE
5030B	Purge and Trap	SW846	ELLE
5030C	Purge and Trap	SW846	ELLE
5035	Closed System Purge and Trap	SW846	ELLE
7.3.3	Cyanide, Reactive	SW846	ELLE
7.3.4	Sulfide, Reactive	SW846	ELLE
7470A	Preparation, Mercury	SW846	ELLE
7471B	Preparation, Mercury	SW846	ELLE

Protocol References:

EPA = US Environmental Protection Agency

NWTPH = Northwest Total Petroleum Hydrocarbon

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ALS MTown = ALS Environmental - Middletown, PA, 301 Fulling Mill Road, Middletown, PA 17057

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-139657-1
SDG: 410-139657

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-139657-1	NBKK-B76-IDW01A-AQ-081723	Water	08/17/23 16:47	08/19/23 09:50
410-139657-2	NBKK-B76-IDW02A-AQ-081723	Water	08/17/23 17:02	08/19/23 09:50
410-139657-3	NBKK-B76-IDW01A-SO-081723	Solid	08/17/23 17:10	08/19/23 09:50
410-139657-4	NBKK-B76-IDW02A-SO-081723	Solid	08/17/23 17:13	08/19/23 09:50

301 Fulling Mill Road | Middletown, PA 17057 | Phone: 717-944-5541 | Fax: 717-944-1430 | www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

Analstiyal Repultp Re8okt Fok

Eurofins Lancaster Laboratories Environmental, LLC

Pkoceyt 666122|410-139W57-1
r okj okdek 331932W
Re8okt DE 2W7/ 03 on / I31I2023

Certificate of Analysis

f nyloped ake the analstiyal kepultp rok pav 8lep keyeibed Ns the laNokatoks on Aug 21, 2023.

The A6L f nbikonv ental laNokatoks in Middletown, Pennpslbania ip a Sational f nbikonv ental 6aNokatoks Ayykeditation Pkogkav (Sf 6AP) ayykedited laNokatoks and ap puyh, yekiinep that all a88liyaNe tept kepultp v eet the kequikev entp omSf 6AP.

Dnsou habe ans queptionp kegakding thip yekiinyate omanalspip, 8leape yontayt Lakah 6eung (Pkoceyt Cookdinatok) at (717) 944-5541.

Analspep weke 8ekrokv ed ayyokding to ouk laNokatoks'p Sf 6AP-a88kobed qualits appukanye 8kogkav and ans a88liyaNe ptate kequikev entp. The tept kepultp v eet kequikev entp omthe yukkent Sf 6AP ptandakdp ok ptate kequikev entp, wheke a88liyaNe. Foka p8eyiny lipt omayykedited analstep, kerek to the yekiinyationp peytion omthe A6L weNpite at www.alpgloNal.yov lenIOuk-Lekbiyepl6ine-Lyienyeplf nbikonv entallEownloadp.

Thip laNokatoks ke8okt v as not Ne ke8koduyed, exye8t in roll, without the wkitten a88kobal omA6L GloNal.
A6L Middletown: 301 Fulling Mill Road, Middletown, PA 17057 : 717-944-5541.

Reyi8ient(p):
f SV LuNyontkayting - 6anyaptek 6aNokatokiep

Sarah Leung

Sarah Leung *(ALS Digital Signature)*
Pkoceyt Cookdinatok

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Sample Summary

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collector	Collection Company
3319326001	NBKK-B76-IDW01A-AQ-081723	Water	08/17/2023 20:47	08/21/2023 13:25	CBC	Collected By Client
3319326002	NBKK-B76-IDW02A-AQ-081723	Water	08/17/2023 21:02	08/21/2023 13:25	CBC	Collected By Client
3319326003	NBKK-B76-IDW01A-SO-081723	Solid	08/17/2023 21:10	08/21/2023 13:25	CBC	Collected By Client
3319326004	NBKK-B76-IDW02A-SO-081723	Solid	08/17/2023 21:13	08/21/2023 13:25	CBC	Collected By Client

Reference

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- Except as qualified, Clean Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 136, including but not limited to the following EPA Method reference revisions:
  EPA 300.1 Rev. 1.0-1997
  EPA 300.0 Rev. 2.1-1993
  EPA 353.2 Rev. 2.0-1993
  EPA 410.4 Rev. 1.0-1993
  EPA 420.4 Rev. 1.0-1993
  EPA 365.1 Rev. 2.0-1993
  EPA 200.7 Rev. 4.4-1994
  EPA 200.8 Rev. 5.4-1994
  EPA 245.1 Rev. 3.0-1994
- Except as qualified, Safe Drinking Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 141.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND) above the MDL
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Practical Quantitation Limit for this Project
ND	Not Detected - indicates that the analyte was Not Detected
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits
#	Please reference the result in the Results Section for analyte-level flags.

Project Notations

Sample Notations

Lab ID	Sample ID

Result Notations

Notation Ref.

Detected Results Summary

Client Sample ID	NBKK-B76-IDW01A-AQ-081723	Collected	08/17/2023 20:47
Lab Sample ID	3319326001	Lab Receipt	08/21/2023 13:25

Compound	Result	Units	LOQ	LOD	DL	Method	Flag
WET CHEMISTRY							
Halogen, Total Organic (TOX)	50.2	ug/L	20.0	16.0	7.8	SW846 9020B	#

Detected Results Summary

Client Sample ID	NBKK-B76-IDW02A-AQ-081723	Collected	08/17/2023 21:02
Lab Sample ID	3319326002	Lab Receipt	08/21/2023 13:25

Compound	Result	Units	LOQ	LOD	DL	Method	Flag
WET CHEMISTRY							
Halogen, Total Organic (TOX)	17.7J	ug/L	20.0	16.0	7.8	SW846 9020B	#

Detected Results Summary

Client Sample ID	NBKK-B76-IDW01A-SO-081723	Collected	08/17/2023 21:10
Lab Sample ID	3319326003	Lab Receipt	08/21/2023 13:25

Compound	Result	Units	LOQ	LOD	DL	Method	Flag
WET CHEMISTRY							
Moisture	12.6	%	0.1	0.1	0.01	S2540G-11	#
Total Solids	87.4	%	0.1	0.1	0.01	S2540G-11	#

Detected Results Summary

Client Sample ID	NBKK-B76-IDW02A-SO-081723	Collected	08/17/2023 21:13
Lab Sample ID	3319326004	Lab Receipt	08/21/2023 13:25

Compound	Result	Units	LOQ	LOD	DL	Method	Flag
WET CHEMISTRY							
Moisture	22.9	%	0.1	0.1	0.01	S2540G-11	#
Total Solids	77.1	%	0.1	0.1	0.01	S2540G-11	#

Results

Client Sample ID	NBKK-B76-IDW01A-AQ-081723	Collected	08/17/2023 20:47
Lab Sample ID	3319326001	Lab Receipt	08/21/2023 13:25

WET CHEMISTRY

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	50.2		ug/L	20.0	16.0	7.8	SW846 9020B	1	08/31/2023 17:58	PAG	A

Results

Client Sample ID	NBKK-B76-IDW02A-AQ-081723	Collected	08/17/2023 21:02
Lab Sample ID	3319326002	Lab Receipt	08/21/2023 13:25

WET CHEMISTRY

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	17.7J	J	ug/L	20.0	16.0	7.8	SW846 9020B	1	08/31/2023 17:58	PAG	A

Results

Client Sample ID	NBKK-B76-IDW01A-SO-081723	Collected	08/17/2023 21:10
Lab Sample ID	3319326003	Lab Receipt	08/21/2023 13:25

WET CHEMISTRY

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	21.3U	U	mg/kg	26.6	21.3	9.6	SW846 9023	1	08/31/2023 18:00	PAG	A
Moisture	12.6		%	0.1	0.1	0.01	S2540G-11	1	08/22/2023 06:47	J1K	
Total Solids	87.4		%	0.1	0.1	0.01	S2540G-11	1	08/22/2023 06:47	J1K	

Results

Client Sample ID	NBKK-B76-IDW02A-SO-081723	Collected	08/17/2023 21:13
Lab Sample ID	3319326004	Lab Receipt	08/21/2023 13:25

WET CHEMISTRY

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	23.7U	U	mg/kg	29.6	23.7	10.7	SW846 9023	1	08/31/2023 18:00	PAG	A
Moisture	22.9		%	0.1	0.1	0.01	S2540G-11	1	08/22/2023 06:47	J1K	
Total Solids	77.1		%	0.1	0.1	0.01	S2540G-11	1	08/22/2023 06:47	J1K	

Sample - Method Cross Reference Table

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3319326001	NBKK-B76-IDW01A-AQ-081723	SW846 9020B	N/A	
3319326002	NBKK-B76-IDW02A-AQ-081723	SW846 9020B	N/A	
3319326003	NBKK-B76-IDW01A-SO-081723	S2540G-11	N/A	
		SW846 9023	N/A	
3319326004	NBKK-B76-IDW02A-SO-081723	S2540G-11	N/A	
		SW846 9023	N/A	

QUALITY CONTROL SAMPLES

WET CHEMISTRY

QC Batch

QC Batch	1050246	Prep Method	N/A
Date	N/A	Analysis Method	S2540G-11
Tech.			

Associated Samples

3319326003 3319326004

Method Blank 3711520 (DUP) 3319327004 (non-Project Sample) For QC Batch 1050246

****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

RESULTS

Compound	CAS No		Result (%)	Orig. Result (%)				Qualifiers
Moisture	MOISTURE	DUP	21.0263	22.2238	RPD	5.54	(Max-10)	
Total Solids	TSP	DUP	78.9736	77.7761	RPD	1.53	(Max-5)	

Method Blank 3711521 (DUP) 3319429004 (non-Project Sample) For QC Batch 1050246

****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

RESULTS

Compound	CAS No		Result (%)	Orig. Result (%)				Qualifiers
Moisture	MOISTURE	DUP	11.0381	10.3950	RPD	6	(Max-10)	
Total Solids	TSP	DUP	88.9618	89.6049	RPD	0.72	(Max-5)	

QC Batch

QC Batch	1052503	Prep Method	N/A
Date	N/A	Analysis Method	SW846 9023
Tech.			

Associated Samples

3319326003 3319326004

Halogen Blank 3716277 (MB) Created on 08/31/2023 10:45 For QC Batch 1052503

RESULTS

Compound	CAS No		Result	Units	LOQ	Qualifiers
Halogen, Total Organic (TOX)	TOX	BLK	20.0U	mg/kg	25.0	U

Matrix Spike 3716541 (MS) 3319326004 For QC Batch 1052503

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Matrix Spike Duplicate 3716542 (MSD) 3319326004 For QC Batch 1052503

QUALITY CONTROL SAMPLES

WET CHEMISTRY (cont.)

RESULTS

Compound	CAS No		Result (mg/kg)	Orig. Result (mg/kg)	Spk Added (mg/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Halogen, Total Organic (TOX)	TOX	MS	467	1.70	457	102	80 - 120		
Halogen, Total Organic (TOX)	TOX	MSD	482	1.70	457	105	80 - 120	RPD 3.12 (Max-20)	

QC Batch

QC Batch 1052505 Prep Method N/A
Date N/A Analysis Method SW846 9020B
Tech.

Associated Samples

3319326001 3319326002

a l Bnkr ix h Sp 3716292 (MB) Created on 08/31/2023 10:49 For QC Batch 1052505

RESULTS

Compound	CAS No		Result	Units	LOQ	Qualifier
Halogen, Total Organic (TOX)	TOX	BLK	160U	ug/L	200	

a BQuic t qpl 3716543 (MS) 3319326002 For QC Batch 1052505

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

a BQuic t qpl iMet hd B 3716544 (MSD) 3319326002 For QC Batch 1052505

RESULTS

Compound	CAS No		Result (ug/L)	Orig. Result (ug/L)	Spk Added (ug/L)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Halogen, Total Organic (TOX)	TOX	MS	219	17.70	200	100	80 - 120		
Halogen, Total Organic (TOX)	TOX	MSD	218	17.70	200	100	80 - 120	RPD 0.18 (Max-20)	

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab ID	Sample ID	Anepanayi Mt eyhi o	Anep dayPh	Anep Daye3lsme	dc	r Malc9s9 t eyhi o	r Mc dayPh
22602NBKK6	- d77 WdQBWD8 K6r W/ WK46QN2	- 3	- 3	- 3		S8 4OB 0KNKd	6K5N5K5
22602NBKKN	- d77 WdQBWD8 KNr W/ WK46QN2	- 3	- 3	- 3		S8 4OB 0KNKd	6K5N5K5
22602NBKK2	- d77 WdQBWD8 K6r WSGWK46QN2	- 3	- 3	- 3		SN5OKf W6	6K5KNOB
		- 3	- 3	- 3		S8 4OB 0KN2	6K5N5K2
22602NBKKO	- d77 WdQBWD8 KNr WSGWK46QN2	- 3	- 3	- 3		SN5OKf W6	6K5KNOB
		- 3	- 3	- 3		S8 4OB 0KN2	6K5N5K2

Eurofins Lancaster Laboratories Environme
2425 New Holland Pike
Lancaster, PA 17601
Phone: 717-656-2300 Fax: 717-656-2681

Chain of Custody Record

3319326
Logged By: MJE
PM: SSL
Testing

Page 1 of 1

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Martin, Elizabeth	Carrier Tracking No(s):	
Client Contact: Shipping/Receiving	Phone:	E-Mail: Elizabeth.Martin@et.eurofinsus.com	State of Origin: Washington	
Company: ALS Environmental		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; State - Washington		Job #: 410-139657-1
Address: 301 Fulling Mill Road,	Due Date Requested: 9/5/2023			
City: Middletown	TAT Requested (days):			
State, Zip: PA, 17057				
Phone:	PO #:			
Email:	WO #:			
Project Name: NBK Keyport	Project #: 41012633			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (Total Organic Halogens)/ EPA 9020B	SUB (Total Organic Halogens)/ EPA 9023	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
NBKK-B76-IDW01-AQ-081723 (410-139657-1)	8/17/23	16:47 Pacific		Water			X		2	See Attached Instructions
NBKK-B76-IDW02-AQ-081723 (410-139657-2)	8/17/23	17:02 Pacific		Water			X		2	See Attached Instructions
NBKK-B76-IDW01-SO-081723 (410-139657-3)	8/17/23	17:10 Pacific		Solid				X	1	See Attached Instructions
NBKK-B76-IDW02-SO-081723 (410-139657-4)	8/17/23	17:13 Pacific		Solid				X	1	See Attached Instructions

Temp By: W | WO Temp (°C): 3/0° | Therm ID: 525

Receipt Info Completed By: CW
Cooler Custody Seal Intact: Y N NA
Sample Custody Seal Intact: Y N NA
Received on Ice: Y N NA (0 0)
Cooler & Samples Intact: Y N
Correct Containers Provided: Y N
Sample Label/COC Agree: Y N
Adequate Sample Volumes: Y N
CR6 Samples Filtered: Y N NA
OP Samples Filtered: Y N NA
VOA Trip Blank: Y N NA
NJ≤ 4 Days? Y N
Rad Screen (uCi):
Courier/Tracking #:

SDWA Compliance: Y N
PWSID:
WV Containers 0-6°C: Y N NA

unp/H2SO4. no clg

Note: Since laboratory accreditations are subject to change, Eurofins Lancaster Laboratories Environment Testing, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Lancaster Laboratories Environment Testing, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Lancaster Laboratories Environment Testing, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Lancaster Laboratories Environment Testing, LLC.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Date: Time: Method of Shipment:

Relinquished by: Kristi Deare	Date/Time: 8/21/23 1026	Company ELLET	Received by:	Date/Time: 8/21/23 1026	Company ELLE
Relinquished by:	Date/Time: 8/21/23 1325	Company ELLE	Received by: CW ALS	Date/Time: 8/21/23 1325	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

2° C water 0° C solid 525

Ver: 06/08/2021

Eurofins Lancaster Laboratories Environme
2425 New Holland Pike
Lancaster, PA 17601
Phone: 717-656-2300 Fax: 717-656-2681

REVISED Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Martin, Elizabeth	Carrier Tracking No(s):	COC No: 410-2316499.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Elizabeth.Martin@et.eurofinsus.com	State of Origin: Washington	Page: Page 1 of 1
Company: ALS Environmental		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; State - Washington		Job #: 410-139657-1
Address: 301 Fulling Mill Road, ,	Due Date Requested: 9/5/2023			
City: Middletown	TAT Requested (days):			
State, Zip: PA, 17057				
Phone:	PO #:			
Email:	WO #:			
Project Name: NBK Keyport	Project #: 41012633			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (Total Organic Halogens)/ EPA 9020B	SUB (Total Organic Halogens)/ EPA 9023	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
NBKK-B76-IDW01A-AQ-081723 (410-139657-1)	8/17/23	16:47 Pacific		Water			X		2	See Attached Instructions
NBKK-B76-IDW02A-AQ-081723 (410-139657-2)	8/17/23	17:02 Pacific		Water			X		2	See Attached Instructions
NBKK-B76-IDW01A-SO-081723 (410-139657-3)	8/17/23	17:10 Pacific		Solid				X	1	See Attached Instructions
NBKK-B76-IDW02A-SO-081723 (410-139657-4)	8/17/23	17:13 Pacific		Solid				X	1	See Attached Instructions

Note: Since laboratory accreditations are subject to change, Eurofins Lancaster Laboratories Environment Testing, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Lancaster Laboratories Environment Testing, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Lancaster Laboratories Environment Testing, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Lancaster Laboratories Environment Testing, LLC.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

ICOC No:
410-2316499

Containers

Count	Container Type	Preservative
4	Amber Glass 250ml - Sulfuric Acid	Sulfuric Acid
2	Soil jar 4oz - clear glass	None

Subcontract Method Instructions

Sample IDs	Method	Method Description	Method Comments
1, 2	SUBCONTRACT	SUB (Total Organic Halogens)/ EPA 9020B	Report Format: **LVL 2 & LVL 4** ; EDD Required: **Promium Element Transfer File**
3, 4	SUBCONTRACT	SUB (Total Organic Halogens)/ EPA 9023	Report Format: **LVL 2 & LVL 4** ; EDD Required: **Promium Element Transfer File**

410-139657 Chain of Custody

vironme

Chain of Custody Record

eurofins | Environment Testing

	Sampler: LYNDSEY KLEPPIN	Lab PM: Martin, Elizabeth	Carrier Tracking No(s):	COC No: 091823-01
Juan Acaron	Phone: 907 227 0525	E-Mail: Elizabeth.Martin@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: Jacobs Engineering Group, Inc.	PWSID:			Job #:
Address: 3011 SW Willston Road	Due Date Requested:			
City: Gainesville	TAT Requested (days):			
State, Zip: FL, 32608-3964	Compliance Project: Δ Yes Δ No			
Phone: 352-384-7002(Tel)	PO #: 148042507			
Email: juan.acaron@jacobs.com	WO #:			
Project Name: NBK Keyport	Project #: 41012633			
Site: BLDG 76	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260D_TCLP VOCs	8270E_TCLP Semivolatiles	6020B_TCLP Metals ; 7470A_TCLP Hg	8270E SIM_Semivolatiles	NWTPH_Gx - NWTPH - Gasoline Range Organics	8082A_PCBs	NWTPH_Dx - NWTPH -DRO & HRO	6020B_Metals ; 7470A_7471B_Hg	1010A - Ignitability	9012_ReactiveCN - Reactive Cyanide	9034_Reactive - Reactive Sulfide	9040- pH and Corrosivity	%Moisture	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N	N/A	N	N/A	N	N	N	N	N	N		
				S			X	X	X	X	X	X	X	X	X	X	X		X	5	For Metals (W): preserve with HNO3 upon receipt
				S			X	X	X	X	X	X	X	X	X	X	X		X	5	For SVOCs (W): subsample SVOC SIM from Liter container
NBKK-B76-IDW01-AQ-081723	8/17/23	1647		W						X	X	X	X	X	X	X	X	X		13	For PCBs (W): subsample SVOC SIM from Liter container
				W						X	X	X	X	X	X	X	X	X		11	

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by: LYNDSEY KLEPPIN	8/18/23 1400	JACOBS			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	8/19/23 930	EMET

Custody Seals Intact: ✓ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: raw 1.8 cor 1.8

Ver: 01/16/2019

Eurofins Lancaster Laboratories Environme
2425 New Holland Pike
Lancaster, PA 17601
Phone (717) 656-2300

Chain of Custody Record

eurofins | Environment Testing

Client Information	Sampler: LYNDSEY KLEMAN	Lab PM: Martin, Elizabeth	Carrier Tracking No(s):	COC No: 081823-02 410-95513-26520.1
Client Contact: Juan Acaron	Phone: 707 227 0525	E-Mail: Elizabeth.Martin@et.eurofinsus.com	State of Origin:	Page: Page 1 of 2
Company: Jacobs Engineering Group, Inc.	PWSID:			Job #:
Address: 3011 SW Willston Road	Due Date Requested:			
City: Gainesville	TAT Requested (days):			
State, Zip: FL, 32608-3964	Compliance Project: Δ Yes Δ No			
Phone: 352-384-7002(Tel)	PO #: 148042507			
Email: juan.acaron@jacobs.com	WO #:			
Project Name: NBK Keyport	Project #: 41012633			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260D_TCLP VOCs	8270E_TCLP Semivolatiles	6020B_TCLP Metals ; 7470A_TCLP Hg	8270E SIM_Semivolatiles	NWTPH_Gx - NWTPH - Gasoline Range Organics	8082A_PCBs	NWTPH_Dx - NWTPH -DRO & HRO	6020B_Metals ; 7470A_7471B_Hg	1010A - Ignitability	9012_ReactiveCN - Reactive Cyanide	9034_Reactive - Reactive Sulfide	9040- pH and Corrosivity	%Moisture	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N	N/A	N	N/A	N	N	N	N	N	N		
				S			X	X	X	X	X	X	X	X	X	X	X		X	5	For Metals (W): preserve with HNO3 upon receipt
				S			X	X	X	X	X	X	X	X	X	X	X		X	5	For SVOCs (W): subsample SVOC SIM from Liter container
				W						X	X	X	X	X	X	X	X	X		11	
NBKK-B76-IDW02-AQ-081723	8/17/23	1702	G	W						X	X	X	X	X	X	X	X	X		13	For PCBs (W): subsample SVOC SIM from Liter container

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

Relinquished by:	Date/Time	Company	Received by:	Date/Time:	Company
LYNDSEY KLEMAN	8/18/23 1400	JACOBS			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 8-19-23 950	Company EUL

Custody Seals Intact: ✓ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: raw 3.8 cor 3.8

Ver: 01/16/2019

Eurofins Lancaster Laboratories Environme
2425 New Holland Pike
Lancaster, PA 17601
Phone (717) 656-2300

Chain of Custody Record

eurofins | Environment Testing

Client Information	Sampler: Lyndsey Klappin	Lab PM: Martin, Elizabeth	Carrier Tracking No(s):	COC No: 410-95513-26520.1 (081823-03)
Client Contact: Juan Acaron	Phone: 707 227 0525	E-Mail: Elizabeth.Martin@et.eurofinsus.com	State of Origin:	Page: Page 1 of 2
Company: Jacobs Engineering Group, Inc.	PWSID:			Job #:
Address: 3011 SW Willston Road	Due Date Requested:			
City: Gainesville	TAT Requested (days):			
State, Zip: FL, 32608-3964	Compliance Project: Δ Yes Δ No			
Phone: 352-384-7002(Tel)	PO #: 148042507			
Email: juan.acaron@jacobs.com	WO #:			
Project Name: NBK Keyport	Project #: 41012633			
Site: B 76	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Y - Trizma; Z - other (specify); Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260D_TCLP VOCs	8270E_TCLP Semivolatiles	6020B_TCLP Metals ; 7470A_TCLP Hg	8270E SIM_Semivolatiles	NWTPH_Gx - NWTPH - Gasoline Range Organics	8082A_PCBs	NWTPH_Dx - NWTPH -DRO & HRO	6020B_Metals ; 7470A_7471B_Hg	1010A - Ignitability	9012_ReactiveCN - Reactive Cyanide	9034_Reactive - Reactive Sulfide	9040- pH and Corrosivity	%Moisture	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N	N/A	N	N/A	N	N	N	N	N	N		
NBKK-B76-10W01-SO-081723	8/17/23	1710		S			X	X	X	X	X	X	X	X	X	X	X		X	6	For Metals (W): preserve with HNO3 upon receipt
NBKK-B76-10W02-SO-081723	8/17/23	1713		S			X	X	X	X	X	X	X	X	X	X	X		X	6	For SVOCs (W): subsample SVOC SIM from Liter container
				W						X	X	X	X	X	X	X	X	X		11	For PCBs (W): subsample SVOC SIM from Liter container
				W						X	X	X	X	X	X	X	X	X		11	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
LYNDSEY KLAPPIN	8/18/23 1400				
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 8-19-23 950	Company

Custody Seals Intact: ✓ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: (IR) 0.8 COC 0.8

Ver: 01/16/2019

SR

9/25/2023

Eurofins Lancaster Laboratories Environme
2425 New Holland Pike
Lancaster, PA 17601
Phone (717) 656-2300

Chain of Custody Record

eurofins | Environment Testing

Client Information	Sampler: LYNDSEY KLEPPIN	Lab PM: Martin, Elizabeth	Carrier Tracking No(s):	COC No: 410-95513-26520.2
Client Contact: Juan Acaron	Phone: 907 227 0525	E-Mail: Elizabeth.Martin@et.eurofinsus.com	State of Origin:	Page: Page 2 of 2
Company: Jacobs Engineering Group, Inc.	PWSID:			Job #:
Address: 3011 SW Willston Road	Due Date Requested:			
City: Gainesville	TAT Requested (days):			
State, Zip: FL, 32608-3964	Compliance Project: Δ Yes Δ No			
Phone: 352-384-7002(Tel)	PO #: 148042507			
Email: juan.acaron@jacobs.com	WO #:			
Project Name: NBK Keyport	Project #: 41012633			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9020_TOX	9023_TOX	Total Number of containers	Special Instructions/Note:
			Preservation Code:				S	N		
NBKK-B76-IDW01-SO-ØB1723	8/17/23		C	S				X	1	Please sub to ALS.
NBKK-B76-IDW02-SO-ØB1723	8/17/23		C	S				X	1	
NBKK-B76-IDW01-AQ-ØB1723	8/17/23		C	W			X		2	
NBKK-B76-IDW02-AQ-ØB1723	8/17/23		G	W			X		2	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
LYNDSEY KLEPPIN	8/18/23	1400 JACOBS			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	8/19/23 0950	NWA

Custody Seals Intact: ✓ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: raw 0.9 cor 0.9

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Jacobs Engineering Group, Inc.

Job Number: 410-139657-1
SDG Number: 410-139657

Login Number: 139657
List Number: 1
Creator: Miller, Wesley R

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

Question	Answer	Comment
The cooler's custody seal is 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 acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	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	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	True	

Appendix I
Raw Data

	10/1/22	10/1/22	10/1/22	11/3/22	11/3/22	9/30/22
s (NG/G)						
sulfonic acid (11Cl-PF3OUdS)	0.5 U	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U
ONA)	0.5 U	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U
fonic acid (9Cl-PF3ONS)	0.5 U	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U
c Acid (EtFOSAA)	0.5 U	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U
etic Acid (MeFOSAA)	0.5 UJ	0.5 UJ	0.499 U	0.5 U	0.5 U	0.5 U
HFPO-DA)	0.5 U	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U
	0.5 U	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U
	0.5 U	0.5 U	0.499 U	0.5 U	0.5 U	10.8
	0.5 U	0.5 U	0.499 U	0.5 U	0.5 U	2.3
	0.5 U	0.227 J	0.499 U	0.186 J	0.238 J	10.8
	0.5 U	0.4 J	0.499 U	0.187 J	0.196 J	4.83
	0.5 U	0.401 J	0.499 U	0.266 J	0.28 J	10.7
	0.5 U	0.5 U	0.499 U	0.203 J	0.289 J	8.12
	0.5 U	83.1	0.206 J	2.21	3.27	30.9
	0.5 U	0.325 J	0.499 U	0.28 J	0.251 J	16.4
	0.5 U	0.5 U	0.499 U	0.5 U	0.5 U	0.502 J
	0.5 U	0.5 U	0.499 U	0.5 U	0.5 U	0.337 J
	0.5 U	0.5 U	0.499 U	0.5 U	0.5 U	5.62 J

al calibration range of the

t be accurate or precise

t detected

	9/30/22	8/30/22	8/30/22	8/30/22	8/31/22	8/30/22	9/1/
s (NG/G)							
sulfonic acid (11Cl-PF3OUdS)	0.501 U	0.602 U	0.538 U	0.573 U	0.579 U	0.622 U	
ONA)	0.501 U	0.602 U	0.538 U	0.573 U	0.579 U	0.622 U	
fonic acid (9Cl-PF3ONS)	0.501 U	0.602 U	0.538 U	0.573 U	0.579 U	0.622 U	
c Acid (EtFOSAA)	0.501 U	0.602 U	0.538 U	0.573 U	0.579 U	0.622 U	
etic Acid (MeFOSAA)	0.501 U	0.602 U	0.538 U	0.573 U	0.579 U	0.622 U	
HFPO-DA)	0.501 U	0.602 U	0.538 U	0.573 U	0.579 U	0.622 U	
	0.501 U	0.602 U	0.538 U	0.573 U	0.579 U	0.622 U	
	0.501 U	0.602 U	0.538 U	0.573 U	0.579 U	0.622 U	
	0.501 U	0.602 U	0.538 U	0.573 U	0.579 U	0.622 U	
	0.365 J	0.602 U	0.538 U	0.573 U	0.579 U	0.622 U	
	0.238 J	0.602 U	0.538 U	0.573 U	0.579 U	0.31 J	
	0.282 J	0.602 U	0.538 U	0.573 U	0.579 U	0.622 U	
	0.2 J	0.602 U	0.538 U	0.573 U	0.579 U	0.622 U	
	1.01	0.602 U	0.538 U	0.323 J	0.579 U	25.9	
	0.382 J	0.602 U	0.538 U	0.573 U	0.579 U	0.622 U	
	0.501 U	0.602 U	0.538 U	0.573 U	0.579 U	0.622 U	
	0.501 U	0.602 U	0.538 U	0.573 U	0.579 U	0.622 U	
	0.501 U	0.602 U	0.538 U	0.573 U	0.579 U	0.622 U	

al calibration range of the

t be accurate or precise

t detected

	8/31/22	9/6/22	10/1/22	8/11/23	8/11/23	8/10/23	8/10/2
s (NG/G)							
sulfonic acid (11Cl-PF3OUdS)	0.575 U	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	
ONA)	0.575 U	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	
fonic acid (9Cl-PF3ONS)	0.575 U	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	
c Acid (EtFOSAA)	0.575 U	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	
etic Acid (MeFOSAA)	0.575 U	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	
HFPO-DA)	0.575 U	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	
	0.575 U	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	
	0.575 U	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	
	0.575 U	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	
	0.575 U	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	
	0.809 J	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	
	0.575 U	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	
	0.575 U	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	
	40.3	0.53 U	4.96 J	0.496 U	0.496 U	0.5 U	
	0.575 U	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	
	0.575 U	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	
	0.575 U	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	
	0.575 U	0.53 U	0.499 U	0.496 U	0.496 U	0.5 U	

al calibration range of the

t be accurate or precise

t detected

	8/9/23	8/9/23	8/9/23	8/9/23	8/9/23	8/8/23	8/9/2
s (NG/G)							
sulfonic acid (11Cl-PF3OUdS)	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U	
ONA)	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U	
fonic acid (9Cl-PF3ONS)	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U	
c Acid (EtFOSAA)	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U	
etic Acid (MeFOSAA)	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U	
IFPO-DA)	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U	
	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U	
	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U	
	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U	
	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U	
	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U	
	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U	
	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U	
	0.501 U	0.499 U	0.5 U	0.499 U	0.876	4.72	
	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.328 J	
	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U	
	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U	
	0.501 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U	

al calibration range of the

t be accurate or precise

t detected

	9/2/22	8/8/23	8/10/23	8/10/23	8/9/23	8/9/23	8/8/23
s (NG/G)							
sulfonic acid (11Cl-PF3OUdS)	0.519 U	0.5 U	0.497 U	0.5 U	0.499 U	0.5 U	
ONA)	0.519 U	0.5 U	0.497 U	0.5 U	0.499 U	0.5 U	
fonic acid (9Cl-PF3ONS)	0.519 U	0.5 U	0.497 U	0.5 U	0.499 U	0.5 U	
c Acid (EtFOSAA)	0.519 U	0.5 U	0.497 U	0.5 U	0.499 U	0.5 U	
etic Acid (MeFOSAA)	0.519 U	0.5 U	0.497 U	0.5 U	0.499 U	0.5 U	
IFPO-DA)	0.519 U	0.5 U	0.497 U	0.5 U	0.499 U	0.5 U	
	0.519 U	0.5 U	0.497 U	0.5 U	0.499 U	0.5 U	
	0.519 U	0.5 U	0.497 U	0.5 U	0.499 U	0.5 U	
	0.519 U	0.5 U	0.497 U	0.5 U	0.499 U	0.5 U	
	0.519 U	0.5 U	0.497 U	0.5 U	0.499 U	0.5 U	
	0.519 U	0.5 U	0.497 U	0.5 U	0.499 U	0.5 U	
	0.519 U	0.5 U	0.497 U	0.5 U	0.499 U	0.5 U	
	0.519 U	0.5 U	0.497 U	0.5 U	0.499 U	0.5 U	
	0.911 J	0.875 J	0.431 J	7.5	0.373 J	2.57	[illegible]
	0.519 U	0.5 U	0.497 U	0.369 J	0.499 U	0.5 U	
	0.519 U	0.5 U	0.497 U	0.5 U	0.499 U	0.5 U	
	0.519 U	0.5 U	0.497 U	0.5 U	0.499 U	0.5 U	
	0.519 U	0.5 U	0.497 U	0.5 U	0.499 U	0.5 U	

al calibration range of the

t be accurate or precise

t detected

	8/9/23	8/9/23	10/13/22	10/7/22	11/2/22	10/8/22	10/15/
s (NG/G)							
sulfonic acid (11Cl-PF3OUdS)	0.499 U	0.501 U	0.501 U	0.499 U	0.499 U	0.499 U	
ONA)	0.499 U	0.501 U	0.501 U	0.499 U	0.499 U	0.499 U	
fonic acid (9Cl-PF3ONS)	0.499 U	0.501 U	0.501 U	0.499 U	0.499 U	0.499 U	
c Acid (EtFOSAA)	0.499 U	0.501 U	0.501 U	0.499 U	0.499 U	0.499 U	
etic Acid (MeFOSAA)	0.499 U	0.501 U	0.501 U	0.499 U	0.499 U	0.499 U	
IFPO-DA)	0.499 U	0.501 U	0.501 U	0.499 U	0.499 U	0.499 U	
	0.499 U	0.501 U	0.501 U	0.499 U	0.499 U	0.499 U	
	0.499 U	0.501 U	0.501 U	0.499 U	0.499 U	0.499 U	
	0.499 U	0.501 U	0.501 U	0.499 U	0.499 U	0.499 U	
	0.499 U	0.501 U	0.501 U	0.499 U	0.499 U	0.499 U	
	0.499 U	0.501 U	0.501 U	0.499 U	0.499 U	0.499 U	
	0.499 U	0.501 U	0.501 U	0.499 U	0.499 U	0.499 U	
	0.499 U	0.501 U	0.501 U	0.262 J	0.499 U	0.499 U	
	1.33	4.54	0.501 U	1.32	0.499 U	0.499 U	
	0.499 U	0.501 U	0.501 U	0.286 J	0.499 U	0.339 J	
	0.499 U	0.501 U	0.501 U	0.499 U	0.499 U	0.499 U	
	0.499 U	0.501 U	0.501 U	0.499 U	0.499 U	0.499 U	
	0.499 U	0.501 U	0.501 U	0.499 U	0.499 U	0.499 U	

al calibration range of the

t be accurate or precise

t detected

	11/1/22	9/30/22	9/30/22	10/4/22	10/3/22	10/4/22	10/6/2
s (NG/G)							
sulfonic acid (11Cl-PF3OUdS)	0.5 U	0.501 U	0.5 U	0.499 U	0.499 U	0.499 U	
ONA)	0.5 U	0.501 U	0.5 U	0.499 U	0.499 U	0.499 U	
fonic acid (9Cl-PF3ONS)	0.5 U	0.501 U	0.5 U	0.499 U	0.499 U	0.499 U	
c Acid (EtFOSAA)	0.5 U	0.501 U	0.5 U	0.499 U	0.499 U	0.499 U	
etic Acid (MeFOSAA)	0.5 U	0.501 U	0.293 J	0.499 U	0.499 U	0.499 U	
HFPO-DA)	0.678 J	0.501 U	0.554 J	0.499 U	0.499 U	0.499 U	
	0.5 U	0.501 U	0.5 U	0.499 U	0.499 U	0.499 U	
	3.2	0.501 U	1.8	0.499 U	0.499 U	0.499 U	
	1.23	0.501 U	0.978 J	0.499 U	0.499 U	0.499 U	
	0.5 U	0.501 U	0.181 J	0.499 U	0.499 U	0.499 U	
	0.5 U	0.501 U	0.5 U	0.499 U	0.499 U	0.499 U	
	0.333 J	0.501 U	0.254 J	0.499 U	0.499 U	0.499 U	
	0.256 J	0.501 U	0.5 U	0.499 U	0.499 U	0.499 U	
	8.93	1.48	6.83	0.231 J	0.499 U	0.499 U	
	0.705 J	0.501 U	0.649 J	0.499 U	0.499 U	0.499 U	
	0.495 J	0.501 U	0.248 J	0.499 U	0.499 U	0.499 U	
	0.5 U	0.501 U	0.5 U	0.499 U	0.499 U	0.499 U	
	0.415 J	0.501 U	0.54 J	0.499 U	0.499 U	0.499 U	

al calibration range of the

t be accurate or precise

t detected

	10/3/22	10/3/22	10/3/22	10/7/22	11/8/22	11/5/22	11
s (NG/G)							
sulfonic acid (11Cl-PF3OUdS)	0.499 U	0.501 U	0.499 U	0.501 U	0.5 U	0.499 U	
ONA)	0.499 U	0.501 U	0.499 U	0.501 U	0.5 U	0.499 U	
fonic acid (9Cl-PF3ONS)	0.499 U	0.501 U	0.499 U	0.501 U	0.5 U	0.499 U	
c Acid (EtFOSAA)	0.499 U	0.501 U	0.499 U	0.501 U	0.5 U	0.499 U	
etic Acid (MeFOSAA)	0.499 U	0.501 U	0.499 U	0.501 U	0.5 U	0.499 U	
IFPO-DA)	0.499 U	0.501 U	0.499 U	0.501 U	0.5 U	0.499 U	
	0.499 U	0.501 U	0.499 U	0.501 U	0.5 U	0.499 U	
	0.499 U	0.501 U	0.499 U	0.501 U	0.5 U	0.499 U	
	0.499 U	0.501 U	0.499 U	0.501 U	0.5 U	0.499 U	
	0.499 U	0.501 U	0.499 U	0.501 U	0.5 U	0.499 U	
	0.499 U	0.501 U	0.499 U	0.501 U	0.5 U	0.499 U	
	0.499 U	0.501 U	0.499 U	0.501 U	0.5 U	0.499 U	
	0.499 U	0.501 U	0.499 U	0.501 U	0.5 U	0.499 U	
	0.499 U	0.501 U	0.499 U	0.501 U	0.5 U	0.499 U	
	0.499 U	0.501 U	0.499 U	0.501 U	0.5 U	0.499 U	
	0.499 U	0.501 U	0.499 U	0.501 UJ	0.5 U	0.499 U	
	0.499 U	0.501 U	0.499 U	0.501 UJ	0.5 U	0.499 U	
	0.499 U	0.501 U	0.499 U	0.501 U	0.5 U	0.499 U	

al calibration range of the

t be accurate or precise

t detected

	11/7/22	11/8/22	11/8/22	11/8/22	10/31/22	9/7/22	
s (NG/G)							
sulfonic acid (11Cl-PF3OUdS)	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U	0.499 U	
ONA)	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U	0.499 U	
fonic acid (9Cl-PF3ONS)	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U	0.499 U	
c Acid (EtFOSAA)	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U	0.499 U	
etic Acid (MeFOSAA)	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U	0.499 U	
HFPO-DA)	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U	0.499 U	
	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U	0.499 U	
	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U	0.499 U	
	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U	0.499 U	
	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U	0.499 U	
	0.277 J	0.499 U	0.469 J	1.34	0.5 U	0.499 U	
	0.5 U	0.499 U	0.5 U	0.212 J	0.5 U	0.499 U	
	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U	0.499 U	
	1.93	1.07	4.03	20.3	0.5 U	0.499 U	
	0.5 U	0.499 U	0.767 J	0.808 J	0.5 U	0.499 U	
	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U	0.499 U	
	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U	0.499 U	
	0.5 U	0.499 U	0.5 U	0.5 U	0.5 U	0.499 U	

al calibration range of the

t be accurate or precise

t detected

	10/29/22	9/7/22	9/7/22	9/8/22	11/1/22	11/1/22
s (NG/G)						
sulfonic acid (11Cl-PF3OUdS)	0.499 U	0.524 U	0.521 U	0.5 U	0.499 U	0
ONA)	0.499 U	0.524 U	0.521 U	0.5 U	0.499 U	0
fonic acid (9Cl-PF3ONS)	0.499 U	0.524 U	0.521 U	0.5 U	0.499 U	0
c Acid (EtFOSAA)	0.499 U	0.524 U	0.521 U	0.5 U	0.499 U	0
etic Acid (MeFOSAA)	0.499 U	0.524 U	0.521 U	0.5 U	0.499 UJ	0
HFPO-DA)	0.499 U	0.524 U	0.521 U	0.5 U	0.499 UJ	0
	0.499 U	0.524 U	0.521 U	0.5 U	0.499 U	0
	0.499 U	0.524 U	0.521 U	0.5 U	0.499 U	0
	0.499 U	0.524 U	0.521 U	0.5 U	0.499 UJ	0
	0.499 U	0.524 U	0.521 U	0.5 U	0.499 U	0
	0.499 U	0.524 U	0.521 U	0.5 U	0.499 U	0
	0.499 U	0.524 U	0.521 U	0.5 U	0.499 U	0
	0.499 U	0.524 U	0.521 U	0.5 U	0.499 U	0
	0.499 U	0.236 J	0.325 J	0.5 U	0.499 U	0
	0.499 U	0.524 U	0.521 U	0.5 U	0.499 U	0
	0.499 U	0.524 U	0.521 U	0.5 U	0.499 UJ	0
	0.499 U	0.524 U	0.521 U	0.5 U	0.499 UJ	0
	0.499 U	0.524 U	0.521 U	0.5 U	0.499 U	0

al calibration range of the

t be accurate or precise

t detected

	11/1/22	11/1/22	9/7/22	10/28/22	10/27/22	10/25/22	10/
s (NG/G)							
sulfonic acid (11Cl-PF3OUdS)	0.5 U	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	
ONA)	0.5 U	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	
fonic acid (9Cl-PF3ONS)	0.5 U	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	
c Acid (EtFOSAA)	0.5 U	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	
etic Acid (MeFOSAA)	0.5 U	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	
IFPO-DA)	0.5 U	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	
	0.5 U	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	
	0.5 U	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	
	0.5 U	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	
	0.5 U	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	
	0.5 U	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	
	0.5 U	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	
	0.5 U	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	
	0.5 U	0.5 U	0.341 J	0.499 U	0.499 U	0.223 J	
	0.5 U	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	
	0.5 UJ	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	
	0.5 UJ	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	
	0.5 U	0.5 U	0.559 U	0.499 U	0.499 U	0.499 U	

al calibration range of the

t be accurate or precise

t detected

	10/27/22	10/26/22	10/25/22
s (NG/G)			
sulfonic acid (11Cl-PF3OUdS)	0.5 U	0.5 U	0.5 U
ONA)	0.5 U	0.5 U	0.5 U
fonic acid (9Cl-PF3ONS)	0.5 U	0.5 U	0.5 U
c Acid (EtFOSAA)	0.5 U	0.5 U	0.5 U
etic Acid (MeFOSAA)	0.5 U	0.5 U	0.5 U
HFPO-DA)	0.5 U	0.5 U	0.5 U
	0.5 U	0.5 U	0.5 U
	0.5 U	0.5 U	0.5 U
	0.5 U	0.5 U	0.5 U
	0.5 U	0.5 U	0.5 U
	0.5 U	0.5 U	0.5 U
	0.5 U	0.5 U	0.5 U
	0.5 U	0.5 U	0.5 U
	0.5 U	0.5 U	0.5 U
	0.5 UT	0.5 U	0.5 U
	0.5 U	0.5 U	0.5 U
	0.5 U	0.5 U	0.5 U

al calibration range of the

t be accurate or precise

t detected

	11/9/22	11/9/22	11/9/22	12/8/22	12/8/22	
es (NG/L)						
-sulfonic acid (11Cl-PF3OUdS)	2.39 U	2.18 U	2.36 U	2.33 U	2.29 U	
DONA)	2.39 U	2.18 U	2.36 U	2.33 U	2.29 U	
lfonic acid (9Cl-PF3ONS)	2.39 U	2.18 U	2.36 U	2.33 U	2.29 U	
tic Acid (EtFOSAA)	2.39 U	2.18 U	2.36 U	2.33 U	2.29 U	
cetic Acid (MeFOSAA)	2.39 U	2.18 U	2.36 U	2.33 U	2.29 U	
HFPO-DA)	2.39 U	2.18 U	2.36 U	2.33 U	2.29 U	
	2.63 J	4.94	2.5 J	2.33 U	2.29 U	
	2.39 U	3.21 J	2.36 U	2.33 U	2.29 U	
	2.39 U	2.18 U	2.36 U	2.33 U	2.29 U	
	1.6 J	154	10.1	2.33 U	2.29 U	
	6.87	66.3	9.85 J	2.33 U	2.29 U	
	2 J	211	11.9	6.19 J	4.96	
	2.39 U	7.61	1.85 J	2.33 U	2.29 U	
	14.5	224	16.4	21.3	18.4	
	1.42 J	75.9	5.69	3.32 J	2.59 J	
	2.39 U	2.18 U	2.36 U	2.33 U	2.29 U	
	2.39 U	2.18 U	2.36 U	2.33 U	2.29 U	
	2.39 U	2.18 U	2.36 U	2.33 U	2.29 U	

ot be accurate or precise

ot detected

	11/11/22	11/11/22	11/10/22	8/14/23	8/14/23	8/15/23
es (NG/L)						
-sulfonic acid (11Cl-PF3OUdS)	2.26 U	2.49 U	2.31 U	2.29 U	2.5 U	2.3
DONA)	2.26 U	2.49 U	2.31 U	2.29 U	2.5 U	2.3
lfonic acid (9Cl-PF3ONS)	2.26 U	2.49 U	2.31 U	2.29 U	2.5 U	2.3
tic Acid (EtFOSAA)	2.26 U	2.49 U	2.31 U	2.29 U	2.5 U	2.3
cetic Acid (MeFOSAA)	2.26 U	2.49 U	2.31 U	2.29 U	2.5 U	2.3
HFPO-DA)	2.26 U	2.49 U	2.31 U	2.29 U	2.5 U	2.3
	1.57 J	2.49 U	2.31 U	2.29 U	2.5 U	1.6
	2.26 U	2.49 U	2.31 U	2.29 U	2.5 U	2.3
	2.26 U	2.49 U	2.31 U	2.29 U	2.5 U	2.3
	2.26 U	2.49 U	2.31 U	2.29 U	2.5 U	3.5
	2.09 J	2.38 J	1.11 J	2.29 U	2.5 U	6.
	2.26 U	2.49 U	2.31 U	2.29 U	2.5 U	6.3
	2.26 U	2.49 U	2.31 U	2.29 U	2.5 U	2.3
	2.26 U	2.49 U	2.31 U	2.29 U	2.5 U	2.3
	2.26 U	2.49 U	2.31 U	2.29 U	2.5 U	8.6
	2.26 U	2.49 U	2.31 U	2.29 U	2.5 U	2.3
	2.26 U	2.49 U	2.31 U	2.29 U	2.5 U	2.3
	2.26 U	2.49 U	2.31 U	2.29 U	2.5 U	2.3

ot be accurate or precise

ot detected

	8/14/23	12/7/22	11/14/22	11/11/22	11/10/22	11/10/22
es (NG/L)						
-sulfonic acid (11Cl-PF3OUdS)	2.25 U	2.4 U	2.35 U	2.34 U	2.41 U	2.23
DONA)	2.25 U	2.4 U	2.35 U	2.34 U	2.41 U	2.23
lfonic acid (9Cl-PF3ONS)	2.25 U	2.4 U	2.35 U	2.34 U	2.41 U	2.23
tic Acid (EtFOSAA)	2.25 U	2.4 U	2.35 U	2.34 U	2.41 U	2.23
cetic Acid (MeFOSAA)	2.25 U	2.4 U	2.35 U	2.34 U	2.41 U	2.23
HFPO-DA)	2.25 U	2.4 U	2.35 U	2.34 U	2.41 U	2.23
	1.27 J	2.4 U	32	15.5	2.41 U	2.23
	2.25 U	2.4 U	2.35 U	2.34 U	2.41 U	2.23
	2.25 U	2.4 U	2.35 U	2.34 U	2.41 U	2.23
	3.13 J	2.4 U	11.3	17.8	2.41 U	2.23
	3.54 J	2.4 U	543	176	2.41 U	2.23
	4.68	5.25 J	38.1	33.9	2.41 U	2.23
	2.25 U	2.4 U	2.35 U	2.34 U	2.41 U	2.23
	2.25 U	7.85	897	288	2.41 U	2.23
	7.92	2.4 U	31	33	2.41 U	2.23
	2.25 U	2.4 UJ	2.35 U	2.34 U	2.41 UJ	2.23
	2.25 U	2.4 UJ	2.35 U	2.34 U	2.41 UJ	2.23
	2.25 U	2.4 U	2.35 U	2.34 U	2.41 U	2.23

ot be accurate or precise

ot detected

	11/10/22	6/1/23	12/8/22	12/8/22	12/8/22	
es (NG/L)						
-sulfonic acid (11Cl-PF3OUdS)	2.41 U	2.54 U	2.31 U	2.37 U	2.31 U	
DONA)	2.41 U	2.54 U	2.31 U	2.37 U	2.31 U	
lfonic acid (9Cl-PF3ONS)	2.41 U	2.54 U	2.31 U	2.37 U	2.31 U	
tic Acid (EtFOSAA)	2.41 U	2.54 U	2.31 U	2.37 U	2.31 U	
cetic Acid (MeFOSAA)	2.41 U	2.54 U	2.31 U	2.37 U	2.31 U	
HFPO-DA)	2.41 U	2.54 U	2.31 U	2.37 U	2.31 U	
	2.41 U	1.11 J	2.31 U	2.37 U	2.31 U	
	2.41 U	2.54 U	2.31 U	2.37 U	2.31 U	
	2.41 U	2.54 U	2.31 U	2.37 U	2.31 U	
	2.41 U	1.54 J	2.31 U	2.37 U	2.31 U	
	2.41 U	22.8	2.31 U	2.37 U	2.31 U	
	2.41 U	2.98 J	4.57 J	1.95 J	4.21 J	
	2.41 U	1.02 J	2.31 U	2.37 U	2.31 U	
	2.41 U	2.54 U	2.31 U	2.37 U	2.31 U	
	2.41 U	7.08	4.09 J	2.37 U	2.31 U	
	2.41 U	2.54 UJ	2.31 U	2.37 UJ	2.31 U	
	2.41 U	2.54 UJ	2.31 U	2.37 UJ	2.31 U	
	2.41 U	2.54 U	2.31 U	2.37 U	2.31 U	

ot be accurate or precise

ot detected

	12/8/22	12/8/22	12/8/22	12/8/22	12/1/22	
es (NG/L)						
-sulfonic acid (11Cl-PF3OUdS)	2.39 U	2.39 U	2.51 UJ	2.36 UJ	2.37 U	
DONA)	2.39 U	2.39 U	2.51 UJ	2.36 UJ	2.37 U	
lfonic acid (9Cl-PF3ONS)	2.39 U	2.39 U	2.51 UJ	2.36 UJ	2.37 U	
tic Acid (EtFOSAA)	2.39 U	2.39 U	2.51 UJ	2.36 U	2.37 U	
cetic Acid (MeFOSAA)	2.39 U	2.39 U	2.51 U	2.36 U	2.37 U	
HFPO-DA)	2.39 U	2.39 U	2.51 U	2.36 UJ	2.37 U	
	2.39 U	2.39 U	2.51 U	2.36 U	2.37 U	
	2.39 U	2.39 U	2.51 U	2.36 U	2.37 U	
	2.39 U	2.39 U	2.51 U	2.36 U	2.37 U	
	13.6	2.39 U	10.8 J	8.98 J	7.61	
	53.3	136	133	157	8.99	
	18.5	3.52 J	18.3 J	21.1 J	9.41	
	2.39 U	2.39 U	5.69 J	7.85 J	2.37 U	
	75.8	123	424	470	47.7	
	138	35.4	358 J	330	27.9	
	2.39 UJ	2.39 U	2.51 U	2.36 U	2.37 UJ	
	2.39 UJ	2.39 U	2.51 U	2.36 U	2.37 U	
	2.39 U	2.39 U	2.51 U	2.36 U	2.37 U	

ot be accurate or precise

ot detected

	12/1/22	12/2/22	12/2/22	12/2/22	12/2/22	12/2/22
es (NG/L)						
-sulfonic acid (11Cl-PF3OUdS)	2.25 U	2.29 U	2.29 U	2.39 U	2.25 U	2.29 U
DONA)	2.25 U	2.29 U	2.29 U	2.39 U	2.25 U	2.29 U
lfonic acid (9Cl-PF3ONS)	2.25 U	2.29 U	2.29 U	2.39 U	2.25 U	2.29 U
tic Acid (EtFOSAA)	2.25 U	2.29 U	2.29 U	2.39 U	2.25 U	2.29 U
cetic Acid (MeFOSAA)	2.25 U	2.29 U	2.29 U	2.39 U	2.25 U	2.29 U
HFPO-DA)	2.25 U	2.29 U	2.29 U	2.39 U	2.25 U	2.29 U
	3.13 J	2.29 U	2.29 UJ	4.81	2.25 U	2.29 U
	2.25 U	2.29 U	2.29 U	2.39 U	2.25 U	2.29 U
	2.25 U	2.29 U	2.29 U	2.39 U	2.25 U	2.29 U
	4.68	2.29 U	2.29 U	2.49 J	2.25 U	2.29 U
	6.41	2.29 U	2.29 U	2.39 U	2.25 U	2.29 U
	5.89	2.29 U	2.29 U	1.93 J	2.25 U	2.29 U
	2.25 U	2.29 U	2.29 U	2.39 U	2.25 U	2.29 U
	31.7	2.29 U	2.29 U	2.39 U	2.25 U	2.29 U
	12.8	2.29 U	2.29 U	1.44 J	2.25 U	2.29 U
	2.25 UJ	2.29 UJ	2.29 UJ	2.39 UJ	2.25 UJ	2.29 UJ
	2.25 U	2.29 U	2.29 U	2.39 U	2.25 U	2.29 U
	2.25 U	2.29 U	2.29 U	2.39 U	2.25 U	2.29 U

ot be accurate or precise

ot detected

Table I-3. Raw Data for Sediment Samples at Naval Base Kitsap-Keyport

Sample ID	NBKK-OU2A2-SD01-0004		NBKK-OU2A2-SD02-0004		NBKK-OU2A2-SD03-0004	
Sample Date	11/10/22		11/10/22		11/10/22	
Chemical Name						
Per- and Polyfluorinated Alkyl Substances (NG/G)						
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	0.519	U	0.63	U	1.15	U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	0.519	U	0.63	U	1.15	U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	0.519	U	0.63	U	1.15	U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	0.519	U	0.63	U	1.15	U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	0.519	U	0.63	U	1.15	U
Perfluoro-2-methyl-3-oxahexanoic acid (HFPO-DA)	0.519	U	0.63	U	1.15	U
Perfluorobutanesulfonic acid (PFBS)	0.519	U	0.63	U	1.15	U
Perfluorodecanoic Acid (PFDA)	0.519	U	0.63	U	1.15	U
Perfluorododecanoic Acid (PFDoA)	0.519	U	0.63	U	1.15	U
Perfluoroheptanoic acid (PFHpA)	0.519	U	0.63	U	1.15	U
Perfluorohexanesulfonic acid (PFHxS)	0.519	U	0.63	U	1.15	U
Perfluorohexanoic Acid (PFHxA)	0.519	U	0.63	U	1.15	U
Perfluorononanoic acid (PFNA)	0.519	U	0.63	U	1.15	U
Perfluorooctane Sulfonate (PFOS)	0.464	J	4.07		1.95	J
Perfluorooctanoic acid (PFOA)	0.286	J	0.63	U	1.15	U
Perfluorotetradecanoic Acid (PFTeDA)	0.519	U	0.63	U	1.15	UJ
Perfluorotridecanoic Acid (PFTrDA)	0.519	U	0.63	U	1.15	UJ
Perfluoroundecanoic Acid (PFUnA)	0.519	U	0.63	U	1.15	U

Notes:
J - Analyte present. Value may or may not be accurate or precise
NG/G - Nanograms per gram
U - The material was analyzed for, but not detected

Appendix J
Data Validation Reports

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-1551
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-B76-FB01-090122	E6464-FS	Water
2	NBKK-B76-EB01-090222-SO	E6465-FS	Water

A Stage 2B/4 data validation was performed on the analytical data for one aqueous equipment blank sample and one aqueous field blank sample collected on September 1-2, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times

- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-B76-FB01-090122	None - ND	-	-	-
NBKK-B76-EB01-090222-SO	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

BATTELLE
R can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-FB01-090122
Battelle ID	E6464-FS
Sample Type	SA
Collection Date	09/01/2022
Extraction Date	09/14/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.259
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.881	2.41	4.83
PFHpA	375-85-9	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.908	2.41	4.83
PFOA	335-67-1	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.975	2.41	4.83
PFNA	375-95-1	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.804	2.41	4.83
PFDA	335-76-2	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.757	2.41	4.83
PFUnA	2058-94-8	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.726	2.41	4.83
PFDoA	307-55-1	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.734	2.41	4.83
PFTrDA	72629-94-8	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.716	2.41	4.83
PFTeDA	376-06-7	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.764	2.41	4.83
NMeFOSAA	2355-31-9	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.994	2.41	4.83
NEtFOSAA	2991-50-6	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.956	2.41	4.83
PFBS	375-73-5	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.836	2.41	4.83
PFHxS	355-46-4	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.962	2.41	4.83
PFOS	1763-23-1	2.41 U	E6464-FS(0)	1.000	10/10/2022	1.03	2.41	4.83
HFPO-DA	13252-13-6	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.835	2.41	4.83
Adona	919005-14-4	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.839	2.41	4.83
9Cl-PF3ONS	756426-58-1	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.994	2.41	4.83
11Cl-PF3OUdS	763051-92-9	2.41 U	E6464-FS(0)	1.000	10/10/2022	0.870	2.41	4.83

11/14/23
Analyzed by: Urso, Vincent
Printed: 11/1/2022

BATTELLE
R can be done

2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-EB01-090222-SO
Battelle ID	E6465-FS
Sample Type	SA
Collection Date	09/02/2022
Extraction Date	09/14/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.289
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.790	2.16	4.33
PFHpA	375-85-9	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.814	2.16	4.33
PFOA	335-67-1	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.874	2.16	4.33
PFNA	375-95-1	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.721	2.16	4.33
PFDA	335-76-2	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.678	2.16	4.33
PFUnA	2058-94-8	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.651	2.16	4.33
PFDoA	307-55-1	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.657	2.16	4.33
PFTrDA	72629-94-8	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.642	2.16	4.33
PFTeDA	376-06-7	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.684	2.16	4.33
NMeFOSAA	2355-31-9	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.891	2.16	4.33
NEtFOSAA	2991-50-6	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.856	2.16	4.33
PFBS	375-73-5	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.749	2.16	4.33
PFHxS	355-46-4	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.862	2.16	4.33
PFOS	1763-23-1	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.926	2.16	4.33
HFPO-DA	13252-13-6	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.748	2.16	4.33
Adona	919005-14-4	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.752	2.16	4.33
9Cl-PF3ONS	756426-58-1	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.891	2.16	4.33
11Cl-PF3OUdS	763051-92-9	2.16 U	E6465-FS(0)	1.000	10/11/2022	0.779	2.16	4.33

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-1552
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-B76-SB01-0203	E6452-FS	Soil
2	NBKK-B76-SB02-0203	E6453-FS	Soil
3	NBKK-B76-SB03-0203	E6454-FS	Soil
4	NBKK-B76-SB03-3334	E6455-FS	Soil
5	NBKK-OU2A5-SS01-0H01	E6456-FS	Soil
6	NBKK-B76-SB04-5859	E6457-FS	Soil
7	NBKK-B76-SS05-0001	E6458-FS	Soil
8	NBKK-OU2A5-SB03P-0102	E6459-FS	Soil
9	NBKK-OU2A5-SB03-0102	E6460-FS	Soil
10	NBKK-B76-SB02-4849	E6461-FS	Soil
11	NBKK-B76-SB04-0102	E6462-FS	Soil
12	NBKK-B76-SB01-2526	E6463-FS	Soil

A Stage 2B/4 data validation was performed on the analytical data for twelve soil samples collected on August 30-September 7, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;

- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-B76-FB01-090122	None - ND	-	-	-
NBKK-B76-EB01-090222-SO	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	NBKK-OU2A5-SS03P-0102 ng/g	NBKK-OU2A5-SS03-0102 ng/g	RPD	Qualifier
PFOS	0.325	0.236	32%	None

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: D. Weaver for Dated: 3/16/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB01-0203
Battelle ID	E6452-FS
Sample Type	SA
Collection Date	08/30/2022
Extraction Date	09/13/2022
Analytical Instrument	Sciex 5500 (AC) LC/MS/MS
% Moisture	17.20
Matrix	SO
Sample Size	4.150
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.602 U	E6452-FS(0)	1.000	10/10/2022	0.214	0.602	1.20
PFHpA	**375-85-9**	**0.602 U**	**E6452-FS(0)**	**1.000**	**10/10/2022**	**0.202**	**0.602**	**1.20**
PFOA	335-67-1	0.602 U	E6452-FS(0)	1.000	10/10/2022	0.258	0.602	1.20
PFNA	**375-95-1**	**0.602 U**	**E6452-FS(0)**	**1.000**	**10/10/2022**	**0.189**	**0.602**	**1.20**
PFDA	335-76-2	0.602 U	E6452-FS(0)	1.000	10/10/2022	0.190	0.602	1.20
PFUnA	**2058-94-8**	**0.602 U**	**E6452-FS(0)**	**1.000**	**10/10/2022**	**0.188**	**0.602**	**1.20**
PFDoA	307-55-1	0.602 U	E6452-FS(0)	1.000	10/10/2022	0.193	0.602	1.20
PFTrDA	**72629-94-8**	**0.602 U**	**E6452-FS(0)**	**1.000**	**10/10/2022**	**0.194**	**0.602**	**1.20**
PFTeDA	376-06-7	0.602 U	E6452-FS(0)	1.000	10/10/2022	0.195	0.602	2.41
NMeFOSAA	**2355-31-9**	**0.602 U**	**E6452-FS(0)**	**1.000**	**10/10/2022**	**0.192**	**0.602**	**2.41**
NEtFOSAA	2991-50-6	0.602 U	E6452-FS(0)	1.000	10/10/2022	0.199	0.602	2.41
PFBS	**375-73-5**	**0.602 U**	**E6452-FS(0)**	**1.000**	**10/10/2022**	**0.206**	**0.602**	**1.20**
PFHxS	355-46-4	0.602 U	E6452-FS(0)	1.000	10/10/2022	0.208	0.602	1.20
PFOS	**1763-23-1**	**0.602 U**	**E6452-FS(0)**	**1.000**	**10/10/2022**	**0.211**	**0.602**	**1.20**
HFPO-DA	13252-13-6	0.602 U	E6452-FS(0)	1.000	10/10/2022	0.192	0.602	2.41
Adona	**919005-14-4**	**0.602 U**	**E6452-FS(0)**	**1.000**	**10/10/2022**	**0.193**	**0.602**	**2.41**
9Cl-PF3ONS	756426-58-1	0.602 U	E6452-FS(0)	1.000	10/10/2022	0.186	0.602	2.41
11Cl-PF3OUdS	**763051-92-9**	**0.602 U**	**E6452-FS(0)**	**1.000**	**10/10/2022**	**0.181**	**0.602**	**2.41**

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB02-0203
Battelle ID	E6453-FS
Sample Type	SA
Collection Date	08/30/2022
Extraction Date	09/13/2022
Analytical Instrument	Sciex 5500 (AC) LC/MS/MS
% Moisture	13.07
Matrix	SO
Sample Size	4.360
Size Unit Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.573 U	E6453-FS(0)	1.000	10/10/2022	0.204	0.573	1.15
PFHpA	**375-85-9**	**0.573 U**	**E6453-FS(0)**	**1.000**	**10/10/2022**	**0.193**	**0.573**	**1.15**
PFOA	335-67-1	0.573 U	E6453-FS(0)	1.000	10/10/2022	0.245	0.573	1.15
PFNA	**375-95-1**	**0.573 U**	**E6453-FS(0)**	**1.000**	**10/10/2022**	**0.180**	**0.573**	**1.15**
PFDA	335-76-2	0.573 U	E6453-FS(0)	1.000	10/10/2022	0.181	0.573	1.15
PFUnA	**2058-94-8**	**0.573 U**	**E6453-FS(0)**	**1.000**	**10/10/2022**	**0.179**	**0.573**	**1.15**
PFDoA	307-55-1	0.573 U	E6453-FS(0)	1.000	10/10/2022	0.183	0.573	1.15
PFTrDA	**72629-94-8**	**0.573 U**	**E6453-FS(0)**	**1.000**	**10/10/2022**	**0.185**	**0.573**	**1.15**
PFTeDA	376-06-7	0.573 U	E6453-FS(0)	1.000	10/10/2022	0.186	0.573	2.29
NMeFOSAA	**2355-31-9**	**0.573 U**	**E6453-FS(0)**	**1.000**	**10/10/2022**	**0.182**	**0.573**	**2.29**
NEtFOSAA	2991-50-6	0.573 U	E6453-FS(0)	1.000	10/10/2022	0.189	0.573	2.29
PFBS	**375-73-5**	**0.573 U**	**E6453-FS(0)**	**1.000**	**10/10/2022**	**0.196**	**0.573**	**1.15**
PFHxS	355-46-4	0.573 U	E6453-FS(0)	1.000	10/10/2022	0.198	0.573	1.15
PFOS	**1763-23-1**	**0.323 J**	**E6453-FS(0)**	**1.000**	**10/10/2022**	**0.201**	**0.573**	**1.15**
HFPO-DA	13252-13-6	0.573 U	E6453-FS(0)	1.000	10/10/2022	0.182	0.573	2.29
Adona	**919005-14-4**	**0.573 U**	**E6453-FS(0)**	**1.000**	**10/10/2022**	**0.183**	**0.573**	**2.29**
9Cl-PF3ONS	756426-58-1	0.573 U	E6453-FS(0)	1.000	10/10/2022	0.177	0.573	2.29
11Cl-PF3OUdS	**763051-92-9**	**0.573 U**	**E6453-FS(0)**	**1.000**	**10/10/2022**	**0.172**	**0.573**	**2.29**

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3

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB03-0203
Battelle ID	E6454-FS
Sample Type	SA
Collection Date	08/30/2022
Extraction Date	09/13/2022
Analytical Instrument	Sciex 5500 (AC) LC/MS/MS
% Moisture	19.78
Matrix	SO
Sample Size	4.020
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.622 U	E6454-FS(0)	1.000	10/10/2022	0.221	0.622	1.24
PFHpA	375-85-9	0.622 U	E6454-FS(0)	1.000	10/10/2022	0.209	0.622	1.24
PFOA	335-67-1	0.622 U	E6454-FS(0)	1.000	10/10/2022	0.266	0.622	1.24
PFNA	375-95-1	0.622 U	E6454-FS(0)	1.000	10/10/2022	0.195	0.622	1.24
PFDA	335-76-2	0.622 U	E6454-FS(0)	1.000	10/10/2022	0.197	0.622	1.24
PFUnA	2058-94-8	0.622 U	E6454-FS(0)	1.000	10/10/2022	0.194	0.622	1.24
PFDoA	307-55-1	0.622 U	E6454-FS(0)	1.000	10/10/2022	0.199	0.622	1.24
PFTrDA	72629-94-8	0.622 U	E6454-FS(0)	1.000	10/10/2022	0.200	0.622	1.24
PFTeDA	376-06-7	0.622 U	E6454-FS(0)	1.000	10/10/2022	0.201	0.622	2.49
NMeFOSAA	2355-31-9	0.622 U	E6454-FS(0)	1.000	10/10/2022	0.198	0.622	2.49
NEtFOSAA	2991-50-6	0.622 U	E6454-FS(0)	1.000	10/10/2022	0.205	0.622	2.49
PFBS	375-73-5	0.622 U	E6454-FS(0)	1.000	10/10/2022	0.213	0.622	1.24
PFHxS	355-46-4	0.310 J	E6454-FS(0)	1.000	10/10/2022	0.215	0.622	1.24
PFOS	1763-23-1	25.9	E6454-FS(0)	1.000	10/10/2022	0.218	0.622	1.24
HFPO-DA	13252-13-6	0.622 U	E6454-FS(0)	1.000	10/10/2022	0.198	0.622	2.49
Adona	919005-14-4	0.622 U	E6454-FS(0)	1.000	10/10/2022	0.199	0.622	2.49
9Cl-PF3ONS	756426-58-1	0.622 U	E6454-FS(0)	1.000	10/10/2022	0.192	0.622	2.49
11Cl-PF3OUdS	763051-92-9	0.622 U	E6454-FS(0)	1.000	10/10/2022	0.187	0.622	2.49

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB03-3334
Battelle ID	E6455-FS
Sample Type	SA
Collection Date	09/01/2022
Extraction Date	09/13/2022
Analytical Instrument	Sciex 5500 (AC) LC/MS/MS
% Moisture	5.36
Matrix	SO
Sample Size	4.720
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.189	0.530	1.06
PFHpA	375-85-9	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.178	0.530	1.06
PFOA	335-67-1	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.227	0.530	1.06
PFNA	375-95-1	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.166	0.530	1.06
PFDA	335-76-2	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.167	0.530	1.06
PFUnA	2058-94-8	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.165	0.530	1.06
PFDoA	307-55-1	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.169	0.530	1.06
PFTrDA	72629-94-8	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.171	0.530	1.06
PFTeDA	376-06-7	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.172	0.530	2.12
NMeFOSAA	2355-31-9	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.168	0.530	2.12
NEtFOSAA	2991-50-6	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.175	0.530	2.12
PFBS	375-73-5	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.181	0.530	1.06
PFHxS	355-46-4	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.183	0.530	1.06
PFOS	1763-23-1	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.185	0.530	1.06
HFPO-DA	13252-13-6	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.168	0.530	2.12
Adona	919005-14-4	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.169	0.530	2.12
9Cl-PF3ONS	756426-58-1	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.163	0.530	2.12
11Cl-PF3OUdS	763051-92-9	0.530 U	E6455-FS(0)	1.000	10/10/2022	0.159	0.530	2.12

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Project Client: CH2M
Project Name: CTO 4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK OU2AS SS01-0H01
Battelle ID	E6456 FS
Sample Type	SA
Collection Date	09/07/2022
Extraction Date	09/13/2022
Analytical Instrument	Sciex 5500 (AC) LC/MS/MS
% Moisture	10.38
Matrix	SO
Sample Size	4.470
Size Unit Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.199	0.559	1.12
PFHpA	375-85-9	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.188	0.559	1.12
PFOA	335-67-1	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.239	0.559	1.12
PFNA	375-95-1	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.176	0.559	1.12
PFDA	335-76-2	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.177	0.559	1.12
PFUnA	2058-94-8	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.174	0.559	1.12
PFDoA	307-55-1	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.179	0.559	1.12
PFTrDA	72629-94-8	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.180	0.559	1.12
PFTeDA	376-06-7	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.181	0.559	2.24
NMeFOSAA	2355-31-9	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.178	0.559	2.24
NEtFOSAA	2991-50-6	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.185	0.559	2.24
PFBS	375-73-5	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.191	0.559	1.12
PFHxS	355-46-4	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.194	0.559	1.12
PFOS	1763-23-1	0.341 J	E6456-FS(0)	1.000	10/10/2022	0.196	0.559	1.12
HFPO-DA	13252-13-6	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.178	0.559	2.24
Adona	919005-14-4	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.179	0.559	2.24
9Cl-PF3ONS	756426-58-1	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.172	0.559	2.24
11Cl-PF3OUdS	763051-92-9	0.559 U	E6456-FS(0)	1.000	10/10/2022	0.168	0.559	2.24

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB04-5859
Battelle ID	E6457-FS
Sample Type	SA
Collection Date	09/06/2022
Extraction Date	09/13/2022
Analytical Instrument	Sciex 5500 (AC) LC/MS/MS
% Moisture	5.69
Matrix	SO
Sample Size	4.720
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.189	0.530	1.06
PFHpA	375-85-9	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.178	0.530	1.06
PFOA	335-67-1	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.227	0.530	1.06
PFNA	375-95-1	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.166	0.530	1.06
PFDA	335-76-2	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.167	0.530	1.06
PFUnA	2058-94-8	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.165	0.530	1.06
PFDoA	307-55-1	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.169	0.530	1.06
PFTrDA	72629-94-8	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.171	0.530	1.06
PFTeDA	376-06-7	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.172	0.530	2.12
NMeFOSAA	2355-31-9	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.168	0.530	2.12
NEtFOSAA	2991-50-6	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.175	0.530	2.12
PFBS	375-73-5	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.181	0.530	1.06
PFHxS	355-46-4	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.183	0.530	1.06
PFOS	1763-23-1	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.185	0.530	1.06
HFPO-DA	13252-13-6	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.168	0.530	2.12
Adona	919005-14-4	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.169	0.530	2.12
9Cl-PF3ONS	756426-58-1	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.163	0.530	2.12
11Cl-PF3OUdS	763051-92-9	0.530 U	E6457-FS(0)	1.000	10/10/2022	0.159	0.530	2.12

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SS05-0001
Battelle ID	E6458-FS
Sample Type	SA
Collection Date	09/02/2022
Extraction Date	09/13/2022
Analytical Instrument	Sciex 5500 (AC) LC/MS/MS
% Moisture	3.86
Matrix	SO
Sample Size	4.820
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.185	0.519	1.04
PFHpA	375-85-9	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.174	0.519	1.04
PFOA	335-67-1	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.222	0.519	1.04
PFNA	375-95-1	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.163	0.519	1.04
PFDA	335-76-2	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.164	0.519	1.04
PFUnA	2058-94-8	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.162	0.519	1.04
PFDoA	307-55-1	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.166	0.519	1.04
PFTrDA	72629-94-8	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.167	0.519	1.04
PFTeDA	376-06-7	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.168	0.519	2.07
NMeFOSAA	2355-31-9	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.165	0.519	2.07
NEtFOSAA	2991-50-6	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.171	0.519	2.07
PFBS	375-73-5	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.177	0.519	1.04
PFHxS	355-46-4	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.179	0.519	1.04
PFOS	1763-23-1	0.911 J	E6458-FS(0)	1.000	10/10/2022	0.182	0.519	1.04
HFPO-DA	13252-13-6	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.165	0.519	2.07
Adona	919005-14-4	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.166	0.519	2.07
9Cl-PF3ONS	756426-58-1	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.160	0.519	2.07
11Cl-PF3OUdS	763051-92-9	0.519 U	E6458-FS(0)	1.000	10/10/2022	0.156	0.519	2.07

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Project Client: CH2M
Project Name: CTO 4117: Northwest PFAS Investigation
Project No : G25161.X1.XX.0026.000001

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Client ID	NBKK-0U2A5 S803P 0102
Battelle ID	E6459-FS
Sample Type	SA
Collection Date	09/07/2022
Extraction Date	09/13/2022
Analytical Instrument	Sciex 5500 (AC) LC/MS/MS
% Moisture	4.10
Matrix	SO
Sample Size	4.800
Size Unit Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.185	0.521	1.04
PFHpA	375-85-9	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.175	0.521	1.04
PFOA	335-67-1	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.223	0.521	1.04
PFNA	375-95-1	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.164	0.521	1.04
PFDA	335-76-2	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.165	0.521	1.04
PFUnA	2058-94-8	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.163	0.521	1.04
PFDoA	307-55-1	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.167	0.521	1.04
PFTrDA	72629-94-8	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.168	0.521	1.04
PFTeDA	376-06-7	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.169	0.521	2.08
NMeFOSAA	2355-31-9	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.166	0.521	2.08
NEtFOSAA	2991-50-6	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.172	0.521	2.08
PFBS	375-73-5	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.178	0.521	1.04
PFHxS	355-46-4	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.180	0.521	1.04
PFOS	1763-23-1	0.325 J	E6459-FS(0)	1.000	10/10/2022	0.182	0.521	1.04
HFPO-DA	13252-13-6	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.166	0.521	2.08
Adona	919005-14-4	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.167	0.521	2.08
9Cl-PF3ONS	756426-58-1	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.160	0.521	2.08
11Cl-PF3OUdS	763051-92-9	0.521 U	E6459-FS(0)	1.000	10/10/2022	0.156	0.521	2.08

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Project Client: CH2M
Project Name: CTO 4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX 0026 000001

Client ID	NBKK-GU2AS-SB03-0102
Battelle ID	E6460 FS
Sample Type	SA
Collection Date	09/07/2022
Extraction Date	09/13/2022
Analytical Instrument	Sciex 5500 (AC) LC/MS/MS
% Moisture	4.50
Matrix	SO
Sample Size	4.770
Size Unit Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.187	0.524	1.05
PFHpA	375-85-9	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.176	0.524	1.05
PFOA	335-67-1	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.224	0.524	1.05
PFNA	375-95-1	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.165	0.524	1.05
PFDA	335-76-2	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.166	0.524	1.05
PFUnA	2058-94-8	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.164	0.524	1.05
PFDoA	307-55-1	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.168	0.524	1.05
PFTrDA	72629-94-8	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.169	0.524	1.05
PFTeDA	376-06-7	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.170	0.524	2.10
NMeFOSAA	2355-31-9	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.167	0.524	2.10
NEtFOSAA	2991-50-6	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.173	0.524	2.10
PFBS	375-73-5	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.179	0.524	1.05
PFHxS	355-46-4	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.181	0.524	1.05
PFOS	1763-23-1	0.236 J	E6460-FS(0)	1.000	10/11/2022	0.183	0.524	1.05
HFPO-DA	13252-13-6	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.167	0.524	2.10
Adona	919005-14-4	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.168	0.524	2.10
9Cl-PF3ONS	756426-58-1	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.161	0.524	2.10
11Cl-PF3OUdS	763051-92-9	0.524 U	E6460-FS(0)	1.000	10/11/2022	0.157	0.524	2.10

NW 3/6/23
Analyzed by: Urso, Vincent
Printed: 11/7/2022

BATTELLE
It can be done

10

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB02-4849
Battelle ID	E6461-FS
Sample Type	SA
Collection Date	08/31/2022
Extraction Date	09/13/2022
Analytical Instrument	Sciex 5500 (AC) LC/MS/MS
% Moisture	13.80
Matrix	SO
Sample Size	4.320
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.206	0.579	1.16
PFHpA	375-85-9	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.194	0.579	1.16
PFOA	335-67-1	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.248	0.579	1.16
PFNA	375-95-1	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.182	0.579	1.16
PFDA	335-76-2	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.183	0.579	1.16
PFUnA	2058-94-8	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.181	0.579	1.16
PFDoA	307-55-1	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.185	0.579	1.16
PFTrDA	72629-94-8	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.186	0.579	1.16
PFTeDA	376-06-7	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.188	0.579	2.31
NMeFOSAA	2355-31-9	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.184	0.579	2.31
NEtFOSAA	2991-50-6	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.191	0.579	2.31
PFBS	375-73-5	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.198	0.579	1.16
PFHxS	355-46-4	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.200	0.579	1.16
PFOS	1763-23-1	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.203	0.579	1.16
HFPO-DA	13252-13-6	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.184	0.579	2.31
Adona	919005-14-4	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.185	0.579	2.31
9Cl-PF3ONS	756426-58-1	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.178	0.579	2.31
11Cl-PF3OUdS	763051-92-9	0.579 U	E6461-FS(0)	1.000	10/11/2022	0.174	0.579	2.31

MW 3/6/23

Analyzed by: Urso, Vincent
Printed: 11/7/2022

BATTELLE
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11

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB04-0102
Battelle ID	E6462-FS
Sample Type	SA
Collection Date	08/31/2022
Extraction Date	09/13/2022
Analytical Instrument	Sciex 5500 (AC) LC/MS/MS
% Moisture	12.73
Matrix	SO
Sample Size	4.350
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.575 U	E6462-FS(0)	1.000	10/11/2022	0.205	0.575	1.15
PFHpA	375-85-9	0.575 U	E6462-FS(0)	1.000	10/11/2022	0.193	0.575	1.15
PFOA	335-67-1	0.575 U	E6462-FS(0)	1.000	10/11/2022	0.246	0.575	1.15
PFNA	375-95-1	0.575 U	E6462-FS(0)	1.000	10/11/2022	0.180	0.575	1.15
PFDA	335-76-2	0.575 U	E6462-FS(0)	1.000	10/11/2022	0.182	0.575	1.15
PFUnA	2058-94-8	0.575 U	E6462-FS(0)	1.000	10/11/2022	0.179	0.575	1.15
PFDoA	307-55-1	0.575 U	E6462-FS(0)	1.000	10/11/2022	0.184	0.575	1.15
PFTrDA	72629-94-8	0.575 U	E6462-FS(0)	1.000	10/11/2022	0.185	0.575	1.15
PFTeDA	376-06-7	0.575 U	E6462-FS(0)	1.000	10/11/2022	0.186	0.575	2.30
NMeFOSAA	2355-31-9	0.575 U	E6462-FS(0)	1.000	10/11/2022	0.183	0.575	2.30
NEtFOSAA	2991-50-6	0.575 U	E6462-FS(0)	1.000	10/11/2022	0.190	0.575	2.30
PFBS	375-73-5	0.575 U	E6462-FS(0)	1.000	10/11/2022	0.197	0.575	1.15
PFHxS	355-46-4	0.809 J	E6462-FS(0)	1.000	10/11/2022	0.199	0.575	1.15
PFOS	1763-23-1	40.3	E6462-FS(0)	1.000	10/11/2022	0.201	0.575	1.15
HFPO-DA	13252-13-6	0.575 U	E6462-FS(0)	1.000	10/11/2022	0.183	0.575	2.30
Adona	919005-14-4	0.575 U	E6462-FS(0)	1.000	10/11/2022	0.184	0.575	2.30
9Cl-PF3ONS	756426-58-1	0.575 U	E6462-FS(0)	1.000	10/11/2022	0.177	0.575	2.30
11Cl-PF3OUdS	763051-92-9	0.575 U	E6462-FS(0)	1.000	10/11/2022	0.172	0.575	2.30

BATTELLE
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12

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB01-2526
Battelle ID	E6463-FS
Sample Type	SA
Collection Date	08/30/2022
Extraction Date	09/13/2022
Analytical Instrument	Sciex 5500 (AC) LC/MS/MS
% Moisture	6.78
Matrix	SO
Sample Size	4.650
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.191	0.538	1.08
PFHpA	375-85-9	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.181	0.538	1.08
PFOA	335-67-1	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.230	0.538	1.08
PFNA	375-95-1	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.169	0.538	1.08
PFDA	335-76-2	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.170	0.538	1.08
PFUnA	2058-94-8	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.168	0.538	1.08
PFDoA	307-55-1	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.172	0.538	1.08
PFTrDA	72629-94-8	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.173	0.538	1.08
PFTeDA	376-06-7	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.174	0.538	2.15
NMeFOSAA	2355-31-9	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.171	0.538	2.15
NEtFOSAA	2991-50-6	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.177	0.538	2.15
PFBS	375-73-5	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.184	0.538	1.08
PFHxS	355-46-4	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.186	0.538	1.08
PFOS	1763-23-1	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.188	0.538	1.08
HFPO-DA	13252-13-6	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.171	0.538	2.15
Adona	919005-14-4	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.172	0.538	2.15
9Cl-PF3ONS	756426-58-1	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.166	0.538	2.15
11Cl-PF3OUdS	763051-92-9	0.538 U	E6463-FS(0)	1.000	10/11/2022	0.161	0.538	2.15

MW 3/6/23

Analyzed by: Urso, Vincent
Printed: 11/7/2022

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-1579
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-OU2A5-SB02-0102	E6619-FS	Soil
2	NBKK-OU2A5-SB03-3334	E6620-FS	Soil

A Stage 2B/4 data validation was performed on the analytical data for two soil samples collected on September 7-8, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning

- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC samples were not collected.

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

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It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A5-SB02-0102
Battelle ID	E6619-FS
Sample Type	SA
Collection Date	09/07/2022
Extraction Date	09/20/2022
Analytical Instrument	Sciex 5500 (AC) LC/MS/MS
% Moisture	11.79
Matrix	SO
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.173	0.499	0.998
PFOS	1763-23-1	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	E6619-FS(0)	1.000	10/11/2022	0.150	0.499	2.00

NW 3/6/23

Analyzed by: Bailey, Kevin
Printed: 1/10/2023

BATTELLE
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2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A5-SB03-3334
Battelle ID	E6620-FS
Sample Type	SA
Collection Date	09/08/2022
Extraction Date	09/20/2022
Analytical Instrument	Sciex 5500 (AC) LC/MS/MS
% Moisture	6.57
Matrix	SO
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	E6620-FS(0)	1.000	10/11/2022	0.178	0.500	1.00
PFHpA	**375-85-9**	**0.500 U**	**E6620-FS(0)**	**1.000**	**10/11/2022**	**0.168**	**0.500**	**1.00**
PFOA	335-67-1	0.500 U	E6620-FS(0)	1.000	10/11/2022	0.214	0.500	1.00
PFNA	**375-95-1**	**0.500 U**	**E6620-FS(0)**	**1.000**	**10/11/2022**	**0.157**	**0.500**	**1.00**
PFDA	335-76-2	0.500 U	E6620-FS(0)	1.000	10/11/2022	0.158	0.500	1.00
PFUnA	**2058-94-8**	**0.500 U**	**E6620-FS(0)**	**1.000**	**10/11/2022**	**0.156**	**0.500**	**1.00**
PFDoA	307-55-1	0.500 U	E6620-FS(0)	1.000	10/11/2022	0.160	0.500	1.00
PFTrDA	**72629-94-8**	**0.500 U**	**E6620-FS(0)**	**1.000**	**10/11/2022**	**0.161**	**0.500**	**1.00**
PFTeDA	376-06-7	0.500 U	E6620-FS(0)	1.000	10/11/2022	0.162	0.500	2.00
NMeFOSAA	**2355-31-9**	**0.500 U**	**E6620-FS(0)**	**1.000**	**10/11/2022**	**0.159**	**0.500**	**2.00**
NEtFOSAA	2991-50-6	0.500 U	E6620-FS(0)	1.000	10/11/2022	0.165	0.500	2.00
PFBS	**375-73-5**	**0.500 U**	**E6620-FS(0)**	**1.000**	**10/11/2022**	**0.171**	**0.500**	**1.00**
PFHxS	355-46-4	0.500 U	E6620-FS(0)	1.000	10/11/2022	0.173	0.500	1.00
PFOS	**1763-23-1**	**0.500 U**	**E6620-FS(0)**	**1.000**	**10/11/2022**	**0.175**	**0.500**	**1.00**
HFPO-DA	13252-13-6	0.500 U	E6620-FS(0)	1.000	10/11/2022	0.159	0.500	2.00
Adona	**919005-14-4**	**0.500 U**	**E6620-FS(0)**	**1.000**	**10/11/2022**	**0.160**	**0.500**	**2.00**
9Cl-PF3ONS	756426-58-1	0.500 U	E6620-FS(0)	1.000	10/11/2022	0.154	0.500	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.500 U**	**E6620-FS(0)**	**1.000**	**10/11/2022**	**0.150**	**0.500**	**2.00**

NW 3/6/23

Analyzed by: Bailey, Kevin
Printed: 1/10/2023

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-1721
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-CF1-EB01-093022-SO	E7805-FS	Water
2	NBKK-B1006-EB01-093022-SO	E7808-FS	Water

A Stage 2B/4 data validation was performed on the analytical data for two aqueous equipment blank samples collected on September 30, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning

- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-CF1-EB01-093022-SO	None - ND	-	-	-
NBKK-B1006-EB01-093022-SO	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria except for the following.

EDS Sample	Internal Standard	Area Count	Qualifier
1	13C2-PFDA	High	None - Sample ND

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-CF1-EB01-093022-SO
Battelle ID	E7805-FS
Sample Type	SA
Collection Date	09/30/2022
Extraction Date	10/12/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.266
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.858	2.35	4.70
PFHpA	375-85-9	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.884	2.35	4.70
PFOA	335-67-1	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.949	2.35	4.70
PFNA	375-95-1	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.783	2.35	4.70
PFDA	335-76-2	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.737	2.35	4.70
PFUnA	2058-94-8	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.707	2.35	4.70
PFDoA	307-55-1	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.714	2.35	4.70
PFTrDA	72629-94-8	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.697	2.35	4.70
PFTeDA	376-06-7	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.743	2.35	4.70
NMeFOSAA	2355-31-9	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.968	2.35	4.70
NEtFOSAA	2991-50-6	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.930	2.35	4.70
PFBS	375-73-5	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.814	2.35	4.70
PFHxS	355-46-4	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.937	2.35	4.70
PFOS	1763-23-1	2.35 U	E7805-FS(0)	1.000	11/2/2022	1.01	2.35	4.70
HFPO-DA	13252-13-6	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.813	2.35	4.70
Adona	919005-14-4	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.817	2.35	4.70
9Cl-PF3ONS	756426-58-1	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.968	2.35	4.70
11Cl-PF3OUdS	763051-92-9	2.35 U	E7805-FS(0)	1.000	11/2/2022	0.847	2.35	4.70

MW 11/14/23

Analyzed by: Boger, Warren
Printed: 12/8/2022

BATTELLE
It can be done

2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B1006-EB01-093022-SO
Battelle ID	E7808-FS
Sample Type	SA
Collection Date	09/30/2022
Extraction Date	10/12/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.256
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.44 U	E7808-FS(0)	1.000	11/2/2022	0.892	2.44	4.88
PFHpA	**375-85-9**	**2.44 U**	**E7808-FS(0)**	**1.000**	**11/2/2022**	**0.919**	**2.44**	**4.88**
PFOA	335-67-1	2.44 U	E7808-FS(0)	1.000	11/2/2022	0.986	2.44	4.88
PFNA	**375-95-1**	**2.44 U**	**E7808-FS(0)**	**1.000**	**11/2/2022**	**0.813**	**2.44**	**4.88**
PFDA	335-76-2	2.44 U	E7808-FS(0)	1.000	11/2/2022	0.766	2.44	4.88
PFUnA	**2058-94-8**	**2.44 U**	**E7808-FS(0)**	**1.000**	**11/2/2022**	**0.734**	**2.44**	**4.88**
PFDoA	307-55-1	2.44 U	E7808-FS(0)	1.000	11/2/2022	0.742	2.44	4.88
PFTrDA	**72629-94-8**	**2.44 U**	**E7808-FS(0)**	**1.000**	**11/2/2022**	**0.725**	**2.44**	**4.88**
PFTeDA	376-06-7	2.44 U	E7808-FS(0)	1.000	11/2/2022	0.772	2.44	4.88
NMeFOSAA	**2355-31-9**	**2.44 U**	**E7808-FS(0)**	**1.000**	**11/2/2022**	**1.01**	**2.44**	**4.88**
NEtFOSAA	2991-50-6	2.44 U	E7808-FS(0)	1.000	11/2/2022	0.967	2.44	4.88
PFBS	**375-73-5**	**2.44 U**	**E7808-FS(0)**	**1.000**	**11/2/2022**	**0.846**	**2.44**	**4.88**
PFHxS	355-46-4	2.44 U	E7808-FS(0)	1.000	11/2/2022	0.974	2.44	4.88
PFOS	**1763-23-1**	**2.44 U**	**E7808-FS(0)**	**1.000**	**11/2/2022**	**1.04**	**2.44**	**4.88**
HFPO-DA	13252-13-6	2.44 U	E7808-FS(0)	1.000	11/2/2022	0.845	2.44	4.88
Adona	**919005-14-4**	**2.44 U**	**E7808-FS(0)**	**1.000**	**11/2/2022**	**0.849**	**2.44**	**4.88**
9Cl-PF3ONS	756426-58-1	2.44 U	E7808-FS(0)	1.000	11/2/2022	1.01	2.44	4.88
11Cl-PF3OUdS	**763051-92-9**	**2.44 U**	**E7808-FS(0)**	**1.000**	**11/2/2022**	**0.880**	**2.44**	**4.88**

NW114123

Analyzed by: Boger, Warren
Printed: 12/8/2022

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-1722
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-CF1-SS05-0001	E7804-FS	Soil
2	NBKK-CF1-SS04-0001	E7806-FS	Soil
3	NBKK-B1006-SS05-0001	E7807-FS	Soil
4	NBKK-B1006-SS06-0001	E7809-FS	Soil
5	NBKK-B1006-SS07-0001	E7810-FS	Soil
6	NBKK-B1006-SB01-0102	E7811-FS	Soil
7	NBKK-B1006-SB02-0102	E7812-FS	Soil
8	NBKK-B1006-SS03-0001	E7813-FS	Soil
9	NBKK-B76-SB05-0304	E7814-FS	Soil
10	NBKK-LFEX-SB03-0102	E7815-FS	Soil

A Stage 2B/4 data validation was performed on the analytical data for ten soil samples collected on September 30-October 3, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- The compound PFOS in sample 7 was reanalyzed outside holding time and was flagged (I) by the laboratory. However, the extracts were stored per draft method EPA Method 1633 which allows for a 90-day holding time. The (I) flags were removed.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-B1006-EB01-093022-SO	None - ND	-	-	-
NBKK-B1006-FB01-101122	None - ND	-	-	-
NBKK-B76-EB01-090222-SO	None - ND	-	-	-
NBKK-B76-FB01-090122	None - ND	-	-	-
NBKK-CF1-EB01-093022-SO	None - ND	-	-	-
NBKK-CF1-FB01-101322	None - ND	-	-	-
NBKK-LFEX-EB01-100422-SO	None - ND	-	-	-
NBKK-LFEX-FB01-100622	None - ND	-	-	-

Surrogate Spike Recoveries

- Several samples exhibited low surrogate percent recoveries (%R) for several surrogate compounds. All associated compounds were qualified (J/UJ) in the samples. Please refer to the surrogate summaries on the Form Is for specific recoveries.

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria except for the following.

EDS Sample	Internal Standard	Area Count	Qualifier
6	13C4-PFOS	High	None - Sample ND
9	13C4-PFOS	High	J - Associated Cmpd

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- Sample 7 was analyzed at a 5X dilution for PFOS due to high concentrations of target compounds. The reporting limits were adjusted accordingly. No action was required.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	N8KK CF1-SS05-0001
Battelle ID	E7804-FS
Sample Type	SA
Collection Date	09/30/2022
Extraction Date	10/13/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	7.07
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.254 J	E7804-FS(0)	1.000	11/9/2022	0.178	0.500	1.00
PFHpA	375-85-9	0.181 J	E7804-FS(0)	1.000	11/9/2022	0.168	0.500	1.00
PFOA	335-67-1	0.649 J	E7804-FS(0)	1.000	11/9/2022	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	E7804-FS(0)	1.000	11/9/2022	0.157	0.500	1.00
PFDA	335-76-2	1.80	E7804-FS(0)	1.000	11/9/2022	0.158	0.500	1.00
PFUnA	2058-94-8	0.540 J	E7804-FS(0)	1.000	11/9/2022	0.156	0.500	1.00
PFDoA	307-55-1	0.978 J	E7804-FS(0)	1.000	11/9/2022	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	E7804-FS(0)	1.000	11/9/2022	0.161	0.500	1.00
PFTeDA	376-06-7	0.248 J	E7804-FS(0)	1.000	11/9/2022	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.554 J	E7804-FS(0)	1.000	11/9/2022	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.293 J	E7804-FS(0)	1.000	11/9/2022	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	E7804-FS(0)	1.000	11/9/2022	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	E7804-FS(0)	1.000	11/9/2022	0.173	0.500	1.00
PFOS	1763-23-1	6.83	E7804-FS(0)	1.000	11/9/2022	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	E7804-FS(0)	1.000	11/9/2022	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	E7804-FS(0)	1.000	11/9/2022	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	E7804-FS(0)	1.000	11/9/2022	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	E7804-FS(0)	1.000	11/9/2022	0.150	0.500	2.00

MW 3/6/23

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

2

Client ID	NBKK-CF1-SS04-0001
Battelle ID	E7806-FS
Sample Type	SA
Collection Date	09/30/2022
Extraction Date	10/13/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	6.03
Matrix	SOIL
Sample Size	4.990
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.178	0.501	1.00
PFHpA	375-85-9	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.168	0.501	1.00
PFOA	335-67-1	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.214	0.501	1.00
PFNA	375-95-1	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.157	0.501	1.00
PFDA	335-76-2	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.158	0.501	1.00
PFUnA	2058-94-8	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.156	0.501	1.00
PFDoA	307-55-1	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.160	0.501	1.00
PFTrDA	72629-94-8	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.161	0.501	1.00
PFTeDA	376-06-7	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.162	0.501	2.00
NMeFOSAA	2355-31-9	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.159	0.501	2.00
NEtFOSAA	2991-50-6	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.165	0.501	2.00
PFBS	375-73-5	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.171	0.501	1.00
PFHxS	355-46-4	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.173	0.501	1.00
PFOS	1763-23-1	1.48	E7806-FS(0)	1.000	11/9/2022	0.175	0.501	1.00
HFPO-DA	13252-13-6	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.159	0.501	2.00
Adona	919005-14-4	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.160	0.501	2.00
9Cl-PF3ONS	756426-58-1	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.154	0.501	2.00
11Cl-PF3OUdS	763051-92-9	0.501 U	E7806-FS(0)	1.000	11/9/2022	0.150	0.501	2.00

MW 3/6/23

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

3

Client ID	NBKK-B1006-SS05-0001
Battelle ID	E7807-FS
Sample Type	SA
Collection Date	09/30/2022
Extraction Date	10/13/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	12.35
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	10.7	E7807-FS(0)	1.000	11/9/2022	0.178	0.500	1.00	
PFHpA	375-85-9	10.8	E7807-FS(0)	1.000	11/9/2022	0.168	0.500	1.00	
PFOA	335-67-1	16.4	E7807-FS(0)	1.000	11/9/2022	0.214	0.500	1.00	
PFNA	375-95-1	8.12	E7807-FS(0)	1.000	11/9/2022	0.157	0.500	1.00	
PFDA	335-76-2	10.8	E7807-FS(0)	1.000	11/9/2022	0.158	0.500	1.00	
PFUnA	2058-94-8	5.62 J	E7807-FS(0)	1.000	11/9/2022	0.156	0.500	1.00	SSL
PFDoA	307-55-1	2.30	E7807-FS(0)	1.000	11/9/2022	0.160	0.500	1.00	
PFTrDA	72629-94-8	0.337 J	E7807-FS(0)	1.000	11/9/2022	0.161	0.500	1.00	
PFTeDA	376-06-7	0.502 J	E7807-FS(0)	1.000	11/9/2022	0.162	0.500	2.00	
NMeFOSAA	2355-31-9	0.500 U	E7807-FS(0)	1.000	11/9/2022	0.159	0.500	2.00	
NEtFOSAA	2991-50-6	0.500 U	E7807-FS(0)	1.000	11/9/2022	0.165	0.500	2.00	
PFBS	375-73-5	0.500 U	E7807-FS(0)	1.000	11/9/2022	0.171	0.500	1.00	
PFHxS	355-46-4	4.83	E7807-FS(0)	1.000	11/9/2022	0.173	0.500	1.00	
PFOS	1763-23-1	30.9	E7807-FS(0)	1.000	11/9/2022	0.175	0.500	1.00	
HFPO-DA	13252-13-6	0.500 U	E7807-FS(0)	1.000	11/9/2022	0.159	0.500	2.00	
Adona	919005-14-4	0.500 U	E7807-FS(0)	1.000	11/9/2022	0.160	0.500	2.00	
9Cl-PF3ONS	756426-58-1	0.500 U	E7807-FS(0)	1.000	11/9/2022	0.154	0.500	2.00	
11Cl-PF3OUdS	763051-92-9	0.500 U	E7807-FS(0)	1.000	11/9/2022	0.150	0.500	2.00	

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B1006-SS05-0001
Battelle ID	E7807-FS
Sample Type	SA
Collection Date	09/30/2022
Extraction Date	10/13/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	80	E7807-FS(0)	11/9/2022
13C4-PFHpA	51	E7807-FS(0)	11/9/2022
13C8-PFOA	61	E7807-FS(0)	11/9/2022
13C9-PFNA	54	E7807-FS(0)	11/9/2022
13C6-PFDA	67	E7807-FS(0)	11/9/2022
13C7-PFUnA	44	E7807-FS(0)	11/9/2022
13C2-PFDoA	53	E7807-FS(0)	11/9/2022
13C2-PFTeDA	112	E7807-FS(0)	11/9/2022
d3-MeFOSAA	60	E7807-FS(0)	11/9/2022
d5-EtFOSAA	57	E7807-FS(0)	11/9/2022
13C3-PFBS	112	E7807-FS(0)	11/9/2022
13C3-PFHxS	87	E7807-FS(0)	11/9/2022
13C8-PFOS	50	E7807-FS(0)	11/9/2022
13C3-HFPO-DA	57	E7807-FS(0)	11/9/2022

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Analyzed by: Harnden, Kelsey
Printed: 12/14/2022

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B1006-SS06-0001
Battelle ID	E7809-FS
Sample Type	SA
Collection Date	09/30/2022
Extraction Date	10/13/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	6.70
Matrix	SOIL
Sample Size	4.990
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.501 U	E7809-FS(0)	1.000	11/9/2022	0.178	0.501	1.00
PFHpA	375-85-9	0.501 U	E7809-FS(0)	1.000	11/9/2022	0.168	0.501	1.00
PFOA	335-67-1	0.501 U	E7809-FS(0)	1.000	11/9/2022	0.214	0.501	1.00
PFNA	375-95-1	0.501 U	E7809-FS(0)	1.000	11/9/2022	0.157	0.501	1.00
PFDA	335-76-2	0.501 U	E7809-FS(0)	1.000	11/9/2022	0.158	0.501	1.00
PFUnA	2058-94-8	0.206 J	E7809-FS(0)	1.000	11/9/2022	0.156	0.501	1.00
PFDoA	307-55-1	0.501 U	E7809-FS(0)	1.000	11/9/2022	0.160	0.501	1.00
PFTrDA	72629-94-8	0.501 U	E7809-FS(0)	1.000	11/9/2022	0.161	0.501	1.00
PFTeDA	376-06-7	0.501 U	E7809-FS(0)	1.000	11/9/2022	0.162	0.501	2.00
NMeFOSAA	2355-31-9	0.501 U	E7809-FS(0)	1.000	11/9/2022	0.159	0.501	2.00
NEtFOSAA	2991-50-6	0.501 U	E7809-FS(0)	1.000	11/9/2022	0.165	0.501	2.00
PFBS	375-73-5	0.501 U	E7809-FS(0)	1.000	11/9/2022	0.171	0.501	1.00
PFHxS	355-46-4	0.501 U	E7809-FS(0)	1.000	11/9/2022	0.173	0.501	1.00
PFOS	1763-23-1	0.425 J	E7809-FS(0)	1.000	11/9/2022	0.175	0.501	1.00
HFPO-DA	13252-13-6	0.501 U	E7809-FS(0)	1.000	11/9/2022	0.159	0.501	2.00
Adona	919005-14-4	0.501 U	E7809-FS(0)	1.000	11/9/2022	0.160	0.501	2.00
9Cl-PF3ONS	756426-58-1	0.501 U	E7809-FS(0)	1.000	11/9/2022	0.154	0.501	2.00
11Cl-PF3OUdS	763051-92-9	0.501 U	E7809-FS(0)	1.000	11/9/2022	0.150	0.501	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B1006-SS07-0001
Battelle ID	E7810-FS
Sample Type	SA
Collection Date	09/30/2022
Extraction Date	10/13/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	26.17
Matrix	SOIL
Sample Size	4.990
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.282 J	E7810-FS(0)	1.000	11/9/2022	0.178	0.501	1.00
PFHpA	375-85-9	0.365 J	E7810-FS(0)	1.000	11/9/2022	0.168	0.501	1.00
PFOA	335-67-1	0.382 J	E7810-FS(0)	1.000	11/9/2022	0.214	0.501	1.00
PFNA	375-95-1	0.200 J	E7810-FS(0)	1.000	11/9/2022	0.157	0.501	1.00
PFDA	335-76-2	0.501 U	E7810-FS(0)	1.000	11/9/2022	0.158	0.501	1.00
PFUnA	2058-94-8	0.501 U	E7810-FS(0)	1.000	11/9/2022	0.156	0.501	1.00
PFDoA	307-55-1	0.501 U	E7810-FS(0)	1.000	11/9/2022	0.160	0.501	1.00
PFTrDA	72629-94-8	0.501 U	E7810-FS(0)	1.000	11/9/2022	0.161	0.501	1.00
PFTeDA	376-06-7	0.501 U	E7810-FS(0)	1.000	11/9/2022	0.162	0.501	2.00
NMeFOSAA	2355-31-9	0.501 U	E7810-FS(0)	1.000	11/9/2022	0.159	0.501	2.00
NEtFOSAA	2991-50-6	0.501 U	E7810-FS(0)	1.000	11/9/2022	0.165	0.501	2.00
PFBS	375-73-5	0.501 U	E7810-FS(0)	1.000	11/9/2022	0.171	0.501	1.00
PFHxS	355-46-4	0.238 J	E7810-FS(0)	1.000	11/9/2022	0.173	0.501	1.00
PFOS	1763-23-1	1.01	E7810-FS(0)	1.000	11/9/2022	0.175	0.501	1.00
HFPO-DA	13252-13-6	0.501 U	E7810-FS(0)	1.000	11/9/2022	0.159	0.501	2.00
Adona	919005-14-4	0.501 U	E7810-FS(0)	1.000	11/9/2022	0.160	0.501	2.00
9Cl-PF3ONS	756426-58-1	0.501 U	E7810-FS(0)	1.000	11/9/2022	0.154	0.501	2.00
11Cl-PF3OUdS	763051-92-9	0.501 U	E7810-FS(0)	1.000	11/9/2022	0.150	0.501	2.00

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Printed: 12/14/2022

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B1006-SB010102
Battelle ID	E7811-FS
Sample Type	SA
Collection Date	10/01/2022
Extraction Date	10/13/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	10.71
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	0.500 U	E7811-FS(0)	1.000	11/9/2022	0.178	0.500	1.00	
PFHpA	**375-85-9**	**0.500 U**	**E7811-FS(0)**	**1.000**	**11/9/2022**	**0.168**	**0.500**	**1.00**	
PFOA	335-67-1	0.500 U	E7811-FS(0)	1.000	11/9/2022	0.214	0.500	1.00	
PFNA	**375-95-1**	**0.500 U**	**E7811-FS(0)**	**1.000**	**11/9/2022**	**0.157**	**0.500**	**1.00**	
PFDA	335-76-2	0.500 U	E7811-FS(0)	1.000	11/9/2022	0.158	0.500	1.00	
PFUnA	**2058-94-8**	**0.500 U**	**E7811-FS(0)**	**1.000**	**11/9/2022**	**0.156**	**0.500**	**1.00**	
PFDoA	307-55-1	0.500 U	E7811-FS(0)	1.000	11/9/2022	0.160	0.500	1.00	
PFTrDA	**72629-94-8**	**0.500 U**	**E7811-FS(0)**	**1.000**	**11/9/2022**	**0.181**	**0.500**	**1.00**	
PFTeDA	376-06-7	0.500 U	E7811-FS(0)	1.000	11/9/2022	0.162	0.500	2.00	
NMeFOSAA	**2355-31-9**	**0.500 U**	**E7811-FS(0)**	**1.000**	**11/9/2022**	**0.159**	**0.500**	**2.00**	
NEtFOSAA	2991-50-6	0.500 U ng	E7811-FS(0)	1.000	11/9/2022	0.165	0.500	2.00	SSL
PFBS	**375-73-5**	**0.500 U**	**E7811-FS(0)**	**1.000**	**11/9/2022**	**0.171**	**0.500**	**1.00**	
PFHxS	355-46-4	0.500 U	E7811-FS(0)	1.000	11/9/2022	0.173	0.500	1.00	
PFOS	**1763-23-1**	**0.500 U**	**E7811-FS(0)**	**1.000**	**11/9/2022**	**0.175**	**0.500**	**1.00**	
HFPO-DA	13252-13-6	0.500 U	E7811-FS(0)	1.000	11/9/2022	0.159	0.500	2.00	
Adona	**919005-14-4**	**0.500 U**	**E7811-FS(0)**	**1.000**	**11/9/2022**	**0.160**	**0.500**	**2.00**	
9Cl-PF3ONS	756426-58-1	0.500 U	E7811-FS(0)	1.000	11/9/2022	0.154	0.500	2.00	
11Cl-PF3OUdS	**763051-92-9**	**0.500 U**	**E7811-FS(0)**	**1.000**	**11/9/2022**	**0.150**	**0.500**	**2.00**	

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b

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B1006-SB010102
Battelle ID	E7811-FS
Sample Type	SA
Collection Date	10/01/2022
Extraction Date	10/13/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	71	E7811-FS(0)	11/9/2022
13C4-PFHpA	74	E7811-FS(0)	11/9/2022
13C8-PFOA	82	E7811-FS(0)	11/9/2022
13C9-PFNA	84	E7811-FS(0)	11/9/2022
13C6-PFDA	79	E7811-FS(0)	11/9/2022
13C7-PFUnA	60	E7811-FS(0)	11/9/2022
13C2-PFDoA	58	E7811-FS(0)	11/9/2022
13C2-PFTeDA	73	E7811-FS(0)	11/9/2022
d3-MeFOSAA	51	E7811-FS(0)	11/9/2022
d5-EtFOSAA	47	E7811-FS(0)	11/9/2022
13C3-PFBS	79	E7811-FS(0)	11/9/2022
13C3-PFHxS	59	E7811-FS(0)	11/9/2022
13C8-PFOS	59	E7811-FS(0)	11/9/2022
13C3-HFPO-DA	65	E7811-FS(0)	11/9/2022

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Analyzed by: Harnden, Kelsey
Printed: 12/14/2022

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

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Client ID	NBKK-B1006-SB020102
Battelle ID	E7812-FS
Sample Type	SA
Collection Date	10/01/2022
Extraction Date	10/13/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	10.63
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.401 J	E7812-FS(0)	1.000	11/9/2022	0.178	0.500	1.00
PFHpA	375-85-9	0.227 J	E7812-FS(0)	1.000	11/9/2022	0.168	0.500	1.00
PFOA	335-67-1	0.325 J	E7812-FS(0)	1.000	11/9/2022	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	E7812-FS(0)	1.000	11/9/2022	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	E7812-FS(0)	1.000	11/9/2022	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	E7812-FS(0)	1.000	11/9/2022	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	E7812-FS(0)	1.000	11/9/2022	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	E7812-FS(0)	1.000	11/9/2022	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	E7812-FS(0)	1.000	11/9/2022	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	E7812-FS(0)	1.000	11/9/2022	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 UJ	E7812-FS(0)	1.000	11/9/2022	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	E7812-FS(0)	1.000	11/9/2022	0.171	0.500	1.00
PFHxS	355-46-4	0.400 J	E7812-FS(0)	1.000	11/9/2022	0.173	0.500	1.00
PFOS	1763-23-1	83.1	E7812-FS-D(3)	5.000	12/8/2022	0.875	2.50	5.00
HFPO-DA	13252-13-6	0.500 U	E7812-FS(0)	1.000	11/9/2022	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	E7812-FS(0)	1.000	11/9/2022	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	E7812-FS(0)	1.000	11/9/2022	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	E7812-FS(0)	1.000	11/9/2022	0.150	0.500	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

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Client ID	NBKK-B1006-SB020102
Battelle ID	E7812-FS
Sample Type	SA
Collection Date	10/01/2022
Extraction Date	10/13/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	77	E7812-FS(0)	11/9/2022
13C4-PFHpA	**83**	**E7812-FS(0)**	**11/9/2022**
13C8-PFOA	88	E7812-FS(0)	11/9/2022
13C9-PFNA	**91**	**E7812-FS(0)**	**11/9/2022**
13C6-PFDA	84	E7812-FS(0)	11/9/2022
13C7-PFUnA	**67**	**E7812-FS(0)**	**11/9/2022**
13C2-PFDoA	55	E7812-FS(0)	11/9/2022
13C2-PFTeDA	**78**	**E7812-FS(0)**	**11/9/2022**
d3-MeFOSAA	50	E7812-FS(0)	11/9/2022
d5-EtFOSAA	**41**	**E7812-FS(0)**	**11/9/2022**
13C3-PFBS	81	E7812-FS(0)	11/9/2022
13C3-PFHxS	**88**	**E7812-FS-D(3)**	**12/8/2022**
13C8-PFOS	89	E7812-FS-D(3)	12/8/2022
13C3-HFPO-DA	**72**	**E7812-FS(0)**	**11/9/2022**

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Analyzed by: Harnden, Kelsey

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

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Client ID	NBKK-B1006-SS03-0001
Battelle ID	E7813-FS
Sample Type	SA
Collection Date	10/01/2022
Extraction Date	10/13/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	2.49
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E7813-FS(0)	1.000	11/9/2022	0.178	0.499	0.998
PFHpA	**375-85-9**	**0.499 U**	**E7813-FS(0)**	**1.000**	**11/9/2022**	**0.168**	**0.499**	**0.998**
PFOA	335-67-1	0.499 U	E7813-FS(0)	1.000	11/9/2022	0.214	0.499	0.998
PFNA	**375-95-1**	**0.499 U**	**E7813-FS(0)**	**1.000**	**11/9/2022**	**0.157**	**0.499**	**0.998**
PFDA	335-76-2	0.499 U	E7813-FS(0)	1.000	11/9/2022	0.158	0.499	0.998
PFUnA	**2058-94-8**	**0.499 U**	**E7813-FS(0)**	**1.000**	**11/9/2022**	**0.156**	**0.499**	**0.998**
PFDoA	307-55-1	0.499 U	E7813-FS(0)	1.000	11/9/2022	0.160	0.499	0.998
PFTrDA	**72629-94-8**	**0.499 U**	**E7813-FS(0)**	**1.000**	**11/9/2022**	**0.161**	**0.499**	**0.998**
PFTeDA	376-06-7	0.499 U	E7813-FS(0)	1.000	11/9/2022	0.162	0.499	2.00
NMeFOSAA	**2355-31-9**	**0.499 U**	**E7813-FS(0)**	**1.000**	**11/9/2022**	**0.159**	**0.499**	**2.00**
NEtFOSAA	2991-50-6	0.499 U	E7813-FS(0)	1.000	11/9/2022	0.165	0.499	2.00
PFBS	**375-73-5**	**0.499 U**	**E7813-FS(0)**	**1.000**	**11/9/2022**	**0.171**	**0.499**	**0.998**
PFHxS	355-46-4	0.499 U	E7813-FS(0)	1.000	11/9/2022	0.173	0.499	0.998
PFOS	**1763-23-1**	**0.206 J**	**E7813-FS(0)**	**1.000**	**11/9/2022**	**0.175**	**0.499**	**0.998**
HFPO-DA	13252-13-6	0.499 U	E7813-FS(0)	1.000	11/9/2022	0.159	0.499	2.00
Adona	**919005-14-4**	**0.499 U**	**E7813-FS(0)**	**1.000**	**11/9/2022**	**0.160**	**0.499**	**2.00**
9Cl-PF3ONS	756426-58-1	0.499 U	E7813-FS(0)	1.000	11/9/2022	0.154	0.499	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.499 U**	**E7813-FS(0)**	**1.000**	**11/9/2022**	**0.150**	**0.499**	**2.00**

NW 3/6/23

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

9

Client ID	NBKK-B76-SB05-0304
Battelle ID	E7814-FS
Sample Type	SA
Collection Date	10/01/2022
Extraction Date	10/13/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	16.15
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	0.499 U	E7814-FS(0)	1.000	11/9/2022	0.178	0.499	0.998	
PFHpA	**375-85-9**	**0.499 U**	**E7814-FS(0)**	**1.000**	**11/9/2022**	**0.168**	**0.499**	**0.998**	
PFOA	335-67-1	0.499 U	E7814-FS(0)	1.000	11/9/2022	0.214	0.499	0.998	
PFNA	**375-95-1**	**0.499 U**	**E7814-FS(0)**	**1.000**	**11/9/2022**	**0.157**	**0.499**	**0.998**	
PFDA	335-76-2	0.499 U	E7814-FS(0)	1.000	11/9/2022	0.158	0.499	0.998	
PFUnA	**2058-94-8**	**0.499 U**	**E7814-FS(0)**	**1.000**	**11/9/2022**	**0.156**	**0.499**	**0.998**	
PFDoA	307-55-1	0.499 U	E7814-FS(0)	1.000	11/9/2022	0.160	0.499	0.998	
PFTrDA	**72629-94-8**	**0.499 U**	**E7814-FS(0)**	**1.000**	**11/9/2022**	**0.161**	**0.499**	**0.998**	
PFTeDA	376-06-7	0.499 U	E7814-FS(0)	1.000	11/9/2022	0.162	0.499	2.00	
NMeFOSAA	**2355-31-9**	**0.499 U**	**E7814-FS(0)**	**1.000**	**11/9/2022**	**0.159**	**0.499**	**2.00**	
NEtFOSAA	2991-50-6	0.499 U	E7814-FS(0)	1.000	11/9/2022	0.165	0.499	2.00	
PFBS	**375-73-5**	**0.499 U**	**E7814-FS(0)**	**1.000**	**11/9/2022**	**0.171**	**0.499**	**0.998**	
PFHxS	355-46-4	0.499 U	E7814-FS(0)	1.000	11/9/2022	0.173	0.499	0.998	
PFOS	**1763-23-1**	**4.96** J	**E7814-FS(0)**	**1.000**	**11/9/2022**	**0.175**	**0.499**	**0.998**	ISH
HFPO-DA	13252-13-6	0.499 U	E7814-FS(0)	1.000	11/9/2022	0.159	0.499	2.00	
Adona	**919005-14-4**	**0.499 U**	**E7814-FS(0)**	**1.000**	**11/9/2022**	**0.160**	**0.499**	**2.00**	
9Cl-PF3ONS	756426-58-1	0.499 U	E7814-FS(0)	1.000	11/9/2022	0.154	0.499	2.00	
11Cl-PF3OUdS	**763051-92-9**	**0.499 U**	**E7814-FS(0)**	**1.000**	**11/9/2022**	**0.150**	**0.499**	**2.00**	

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

10

Client ID	NBKK-LFEX-SB03-0102
Battelle ID	E7815-FS
Sample Type	SA
Collection Date	10/03/2022
Extraction Date	10/13/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	13.33
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E7815-FS(0)	1.000	11/9/2022	0.178	0.499	0.998
PFHpA	**375-85-9**	**0.499 U**	**E7815-FS(0)**	**1.000**	**11/9/2022**	**0.168**	**0.499**	**0.998**
PFOA	335-67-1	0.499 U	E7815-FS(0)	1.000	11/9/2022	0.214	0.499	0.998
PFNA	**375-95-1**	**0.499 U**	**E7815-FS(0)**	**1.000**	**11/9/2022**	**0.157**	**0.499**	**0.998**
PFDA	335-76-2	0.499 U	E7815-FS(0)	1.000	11/9/2022	0.158	0.499	0.998
PFUnA	**2058-94-8**	**0.499 U**	**E7815-FS(0)**	**1.000**	**11/9/2022**	**0.156**	**0.499**	**0.998**
PFDoA	307-55-1	0.499 U	E7815-FS(0)	1.000	11/9/2022	0.160	0.499	0.998
PFTrDA	**72629-94-8**	**0.499 U**	**E7815-FS(0)**	**1.000**	**11/9/2022**	**0.161**	**0.499**	**0.998**
PFTeDA	376-06-7	0.499 U	E7815-FS(0)	1.000	11/9/2022	0.162	0.499	2.00
NMeFOSAA	**2355-31-9**	**0.499 U**	**E7815-FS(0)**	**1.000**	**11/9/2022**	**0.159**	**0.499**	**2.00**
NEtFOSAA	2991-50-6	0.499 U	E7815-FS(0)	1.000	11/9/2022	0.165	0.499	2.00
PFBS	**375-73-5**	**0.499 U**	**E7815-FS(0)**	**1.000**	**11/9/2022**	**0.171**	**0.499**	**0.998**
PFHxS	355-46-4	0.499 U	E7815-FS(0)	1.000	11/9/2022	0.173	0.499	0.998
PFOS	**1763-23-1**	**0.499 U**	**E7815-FS(0)**	**1.000**	**11/9/2022**	**0.175**	**0.499**	**0.998**
HFPO-DA	13252-13-6	0.499 U	E7815-FS(0)	1.000	11/9/2022	0.159	0.499	2.00
Adona	**919005-14-4**	**0.499 U**	**E7815-FS(0)**	**1.000**	**11/9/2022**	**0.160**	**0.499**	**2.00**
9Cl-PF3ONS	756426-58-1	0.499 U	E7815-FS(0)	1.000	11/9/2022	0.154	0.499	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.499 U**	**E7815-FS(0)**	**1.000**	**11/9/2022**	**0.150**	**0.499**	**2.00**

NW 31613

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-1766
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-LFEX-EB01-100422-SO	E8157-FS	Water

A Stage 2B/4 data validation was performed on the analytical data for one aqueous equipment blank sample collected on October 4, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries

- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-LFEX-EB01-100422-SO	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

BATTELLE
R can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-EB01-100422-SO
Battelle ID	E8157-FS
Sample Type	SA
Collection Date	10/04/2022
Extraction Date	10/17/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.272
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.839	2.30	4.60
PFHpA	375-85-9	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.865	2.30	4.60
PFOA	335-67-1	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.928	2.30	4.60
PFNA	375-95-1	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.766	2.30	4.60
PFDA	335-76-2	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.721	2.30	4.60
PFUnA	2058-94-8	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.691	2.30	4.60
PFDoA	307-55-1	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.699	2.30	4.60
PFTrDA	72629-94-8	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.682	2.30	4.60
PFTeDA	376-06-7	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.727	2.30	4.60
NMeFOSAA	2355-31-9	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.947	2.30	4.60
NEtFOSAA	2991-50-6	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.910	2.30	4.60
PFBS	375-73-5	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.796	2.30	4.60
PFHxS	355-46-4	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.916	2.30	4.60
PFOS	1763-23-1	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.983	2.30	4.60
HFPO-DA	13252-13-6	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.795	2.30	4.60
Adona	919005-14-4	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.799	2.30	4.60
9Cl-PF3ONS	756426-58-1	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.947	2.30	4.60
11Cl-PF3OUdS	763051-92-9	2.30 U	E8157-FS(0)	1.000	11/9/2022	0.828	2.30	4.60

11/14/23
Analyzed by: Lynch, Kimberly

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-1767
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-LFEX-SB03-0708	E8151-FS	Soil
2	NBKK-LFEX-SB03-1718	E8152-FS	Soil
3	NBKK-LFEX-SS02-0001	E8153-FS	Soil
4	NBKK-LFEX-SB02-2122	E8154-FS	Soil
5	NBKK-LFEX-SS01-0001	E8155-FS	Soil
6	NBKK-LFEX-SS04-0001	E8156-FS	Soil

A Stage 2B/4 data validation was performed on the analytical data for six soil samples collected on October 3-4, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-LFEX-EB01-100422-SO	None - ND	-	-	-
NBKK-FB01-100622	None - ND	-	-	-

Surrogate Spike Recoveries

- Several samples exhibited low surrogate percent recoveries (%R) for several surrogate compounds. All associated compounds were qualified (J/UJ) in the samples. Please refer to the surrogate summaries on the Form Is for specific recoveries.

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

BATTELLE
R can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-SB03-0708
Battelle ID	E8151-FS
Sample Type	SA
Collection Date	10/03/2022
Extraction Date	10/17/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	20.03
Matrix	SOIL
Sample Size	4.990
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.178	0.501	1.00
PFHpA	375-85-9	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.168	0.501	1.00
PFOA	335-67-1	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.214	0.501	1.00
PFNA	375-95-1	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.157	0.501	1.00
PFDA	335-76-2	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.158	0.501	1.00
PFUnA	2058-94-8	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.156	0.501	1.00
PFDoA	307-55-1	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.160	0.501	1.00
PFTrDA	72629-94-8	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.161	0.501	1.00
PFTeDA	376-06-7	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.162	0.501	2.00
NMeFOSAA	2355-31-9	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.159	0.501	2.00
NEtFOSAA	2991-50-6	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.165	0.501	2.00
PFBS	375-73-5	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.171	0.501	1.00
PFHxS	355-46-4	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.173	0.501	1.00
PFOS	1763-23-1	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.175	0.501	1.00
HFPO-DA	13252-13-6	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.159	0.501	2.00
Adona	919005-14-4	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.160	0.501	2.00
9Cl-PF3ONS	756426-58-1	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.154	0.501	2.00
11Cl-PF3OUdS	763051-92-9	0.501 U	E8151-FS(0)	1.000	11/14/2022	0.150	0.501	2.00

BATTELLE
It can be done

2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-SB03-1718
Battelle ID	E8152-FS
Sample Type	SA
Collection Date	10/03/2022
Extraction Date	10/17/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	16.64
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	0.499 U	E8152-FS(0)	1.000	11/14/2022	0.178	0.499	0.998	
PFHpA	375-85-9	0.499 U	E8152-FS(0)	1.000	11/14/2022	0.168	0.499	0.998	
PFOA	335-67-1	0.499 U	E8152-FS(0)	1.000	11/14/2022	0.214	0.499	0.998	
PFNA	375-95-1	0.499 U	E8152-FS(0)	1.000	11/14/2022	0.157	0.499	0.998	
PFDA	335-76-2	0.499 U	E8152-FS(0)	1.000	11/14/2022	0.158	0.499	0.998	
PFUnA	2058-94-8	0.499 U	E8152-FS(0)	1.000	11/14/2022	0.156	0.499	0.998	
PFDoA	307-55-1	0.499 U	E8152-FS(0)	1.000	11/14/2022	0.160	0.499	0.998	
PFTrDA	72629-94-8	0.499 UJ	E8152-FS(0)	1.000	11/14/2022	0.161	0.499	0.998	SSL
PFTeDA	376-06-7	0.499 UJ	E8152-FS(0)	1.000	11/14/2022	0.162	0.499	2.00	SSL
NMeFOSAA	2355-31-9	0.499 U	E8152-FS(0)	1.000	11/14/2022	0.159	0.499	2.00	
NEtFOSAA	2991-50-6	0.499 U	E8152-FS(0)	1.000	11/14/2022	0.165	0.499	2.00	
PFBS	375-73-5	0.499 U	E8152-FS(0)	1.000	11/14/2022	0.171	0.499	0.998	
PFHxS	355-46-4	0.499 U	E8152-FS(0)	1.000	11/14/2022	0.173	0.499	0.998	
PFOS	1763-23-1	0.499 U	E8152-FS(0)	1.000	11/14/2022	0.175	0.499	0.998	
HFPO-DA	13252-13-6	0.499 U	E8152-FS(0)	1.000	11/14/2022	0.159	0.499	2.00	
Adona	919005-14-4	0.499 U	E8152-FS(0)	1.000	11/14/2022	0.160	0.499	2.00	
9Cl-PF3ONS	756426-58-1	0.499 U	E8152-FS(0)	1.000	11/14/2022	0.154	0.499	2.00	
11Cl-PF3OUdS	763051-92-9	0.499 U	E8152-FS(0)	1.000	11/14/2022	0.150	0.499	2.00	

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-SB03-1718
Battelle ID	E8152-FS
Sample Type	SA
Collection Date	10/03/2022
Extraction Date	10/17/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	93	E8152-FS(0)	11/14/2022
13C4-PFHpA	**88**	**E8152-FS(0)**	**11/14/2022**
13C8-PFOA	93	E8152-FS(0)	11/14/2022
13C9-PFNA	**92**	**E8152-FS(0)**	**11/14/2022**
13C6-PFDA	92	E8152-FS(0)	11/14/2022
13C7-PFUnA	**76**	**E8152-FS(0)**	**11/14/2022**
13C2-PFDoA	63	E8152-FS(0)	11/14/2022
13C2-PFTeDA	**41**	**E8152-FS(0)**	**11/14/2022**
d3-MeFOSAA	68	E8152-FS(0)	11/14/2022
d5-EtFOSAA	**55**	**E8152-FS(0)**	**11/14/2022**
13C3-PFBS	94	E8152-FS(0)	11/14/2022
13C3-PFHxS	**84**	**E8152-FS(0)**	**11/14/2022**
13C8-PFOS	108	E8152-FS(0)	11/14/2022
13C3-HFPO-DA	**93**	**E8152-FS(0)**	**11/14/2022**

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3

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-SS02-0001
Battelle ID	E8153-FS
Sample Type	SA
Collection Date	10/03/2022
Extraction Date	10/17/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	3.08
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E8153-FS(0)	1.000	11/14/2022	0.178	0.499	0.998
PFHpA	**375-85-9**	**0.499 U**	**E8153-FS(0)**	**1.000**	**11/14/2022**	**0.168**	**0.499**	**0.998**
PFOA	335-67-1	0.499 U	E8153-FS(0)	1.000	11/14/2022	0.214	0.499	0.998
PFNA	**375-95-1**	**0.499 U**	**E8153-FS(0)**	**1.000**	**11/14/2022**	**0.157**	**0.499**	**0.998**
PFDA	335-76-2	0.499 U	E8153-FS(0)	1.000	11/14/2022	0.158	0.499	0.998
PFUnA	**2058-94-8**	**0.499 U**	**E8153-FS(0)**	**1.000**	**11/14/2022**	**0.156**	**0.499**	**0.998**
PFDoA	307-55-1	0.499 U	E8153-FS(0)	1.000	11/14/2022	0.160	0.499	0.998
PFTrDA	**72629-94-8**	**0.499 U**	**E8153-FS(0)**	**1.000**	**11/14/2022**	**0.161**	**0.499**	**0.998**
PFTeDA	376-06-7	0.499 U	E8153-FS(0)	1.000	11/14/2022	0.162	0.499	2.00
NMeFOSAA	**2355-31-9**	**0.499 U**	**E8153-FS(0)**	**1.000**	**11/14/2022**	**0.159**	**0.499**	**2.00**
NEtFOSAA	2991-50-6	0.499 U	E8153-FS(0)	1.000	11/14/2022	0.165	0.499	2.00
PFBS	**375-73-5**	**0.499 U**	**E8153-FS(0)**	**1.000**	**11/14/2022**	**0.171**	**0.499**	**0.998**
PFHxS	355-46-4	0.499 U	E8153-FS(0)	1.000	11/14/2022	0.173	0.499	0.998
PFOS	**1763-23-1**	**0.499 U**	**E8153-FS(0)**	**1.000**	**11/14/2022**	**0.175**	**0.499**	**0.998**
HFPO-DA	13252-13-6	0.499 U	E8153-FS(0)	1.000	11/14/2022	0.159	0.499	2.00
Adona	**919005-14-4**	**0.499 U**	**E8153-FS(0)**	**1.000**	**11/14/2022**	**0.160**	**0.499**	**2.00**
9Cl-PF3ONS	756426-58-1	0.499 U	E8153-FS(0)	1.000	11/14/2022	0.154	0.499	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.499 U**	**E8153-FS(0)**	**1.000**	**11/14/2022**	**0.150**	**0.499**	**2.00**

MW 1/19/23
Analyzed by: Harnden, Kelsey
Printed: 12/20/2022

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-SB02-2122
Battelle ID	E8154-FS
Sample Type	SA
Collection Date	10/04/2022
Extraction Date	10/17/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	28.84
Matrix	SOIL
Sample Size	4.980
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.502 U	E8154-FS(0)	1.000	11/15/2022	0.179	0.502	1.00
PFHpA	**375-85-9**	**0.502 U**	**E8154-FS(0)**	**1.000**	**11/15/2022**	**0.169**	**0.502**	**1.00**
PFOA	335-67-1	0.502 U	E8154-FS(0)	1.000	11/15/2022	0.215	0.502	1.00
PFNA	**375-95-1**	**0.502 U**	**E8154-FS(0)**	**1.000**	**11/15/2022**	**0.158**	**0.502**	**1.00**
PFDA	335-76-2	0.502 U	E8154-FS(0)	1.000	11/15/2022	0.159	0.502	1.00
PFUnA	**2058-94-8**	**0.502 U**	**E8154-FS(0)**	**1.000**	**11/15/2022**	**0.157**	**0.502**	**1.00**
PFDoA	307-55-1	0.502 U	E8154-FS(0)	1.000	11/15/2022	0.161	0.502	1.00
PFTrDA	**72629-94-8**	**0.502 U**	**E8154-FS(0)**	**1.000**	**11/15/2022**	**0.162**	**0.502**	**1.00**
PFTeDA	376-06-7	0.502 U	E8154-FS(0)	1.000	11/15/2022	0.163	0.502	2.01
NMeFOSAA	**2355-31-9**	**0.502 U**	**E8154-FS(0)**	**1.000**	**11/15/2022**	**0.160**	**0.502**	**2.01**
NEtFOSAA	2991-50-6	0.502 U	E8154-FS(0)	1.000	11/15/2022	0.166	0.502	2.01
PFBS	**375-73-5**	**0.502 U**	**E8154-FS(0)**	**1.000**	**11/15/2022**	**0.172**	**0.502**	**1.00**
PFHxS	355-46-4	0.502 U	E8154-FS(0)	1.000	11/15/2022	0.174	0.502	1.00
PFOS	**1763-23-1**	**0.502 U**	**E8154-FS(0)**	**1.000**	**11/15/2022**	**0.176**	**0.502**	**1.00**
HFPO-DA	13252-13-6	0.502 U	E8154-FS(0)	1.000	11/15/2022	0.160	0.502	2.01
Adona	**919005-14-4**	**0.502 U**	**E8154-FS(0)**	**1.000**	**11/15/2022**	**0.161**	**0.502**	**2.01**
9Cl-PF3ONS	756426-58-1	0.502 U	E8154-FS(0)	1.000	11/15/2022	0.155	0.502	2.01
11Cl-PF3OUdS	**763051-92-9**	**0.502 U**	**E8154-FS(0)**	**1.000**	**11/15/2022**	**0.151**	**0.502**	**2.01**

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-SS01-0001
Battelle ID	E8155-FS
Sample Type	SA
Collection Date	10/04/2022
Extraction Date	10/17/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	4.01
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.173	0.499	0.998
PFOS	1763-23-1	0.231 J	E8155-FS(0)	1.000	11/15/2022	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	E8155-FS(0)	1.000	11/15/2022	0.150	0.499	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-SS04-0001
Battelle ID	E8156-FS
Sample Type	SA
Collection Date	10/04/2022
Extraction Date	10/17/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	5.99
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.173	0.499	0.998
PFOS	1763-23-1	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	E8156-FS(0)	1.000	11/15/2022	0.150	0.499	2.00

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-1800
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-LFEX-FB01-100622	E8358-FS	Water
2	NBKK-CF1-EB01-10082022-SO	E8364-FS	Water

A Stage 2B/4 data validation was performed on the analytical data for one aqueous equipment blank sample and one aqueous field blank sample collected on October 6-8, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times

- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-LFEX-FB01-100622	None - ND	-	-	-
NBKK-CF1-EB01-10082022-SO	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-FB01-100622
Battelle ID	E8358-FS
Sample Type	SA
Collection Date	10/06/2022
Extraction Date	10/18/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.236
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.65 U	E8358-FS(0)	1.000	11/9/2022	0.967	2.65	5.30
PFHpA	375-85-9	2.65 U	E8358-FS(0)	1.000	11/9/2022	0.997	2.65	5.30
PFOA	335-67-1	2.65 U	E8358-FS(0)	1.000	11/9/2022	1.07	2.65	5.30
PFNA	375-95-1	2.65 U	E8358-FS(0)	1.000	11/9/2022	0.882	2.65	5.30
PFDA	335-76-2	2.65 U	E8358-FS(0)	1.000	11/9/2022	0.831	2.65	5.30
PFUnA	2058-94-8	2.65 U	E8358-FS(0)	1.000	11/9/2022	0.797	2.65	5.30
PFDoA	307-55-1	2.65 U	E8358-FS(0)	1.000	11/9/2022	0.805	2.65	5.30
PFTrDA	72629-94-8	2.65 U	E8358-FS(0)	1.000	11/9/2022	0.786	2.65	5.30
PFTeDA	376-06-7	2.65 U	E8358-FS(0)	1.000	11/9/2022	0.838	2.65	5.30
NMeFOSAA	2355-31-9	2.65 U	E8358-FS(0)	1.000	11/9/2022	1.09	2.65	5.30
NEtFOSAA	2991-50-6	2.65 U	E8358-FS(0)	1.000	11/9/2022	1.05	2.65	5.30
PFBS	375-73-5	2.65 U	E8358-FS(0)	1.000	11/9/2022	0.917	2.65	5.30
PFHxS	355-46-4	2.65 U	E8358-FS(0)	1.000	11/9/2022	1.06	2.65	5.30
PFOS	1763-23-1	2.65 U	E8358-FS(0)	1.000	11/9/2022	1.13	2.65	5.30
HFPO-DA	13252-13-6	2.65 U	E8358-FS(0)	1.000	11/9/2022	0.916	2.65	5.30
Adona	919005-14-4	2.65 U	E8358-FS(0)	1.000	11/9/2022	0.921	2.65	5.30
9Cl-PF3ONS	756426-58-1	2.65 U	E8358-FS(0)	1.000	11/9/2022	1.09	2.65	5.30
11Cl-PF3OUdS	763051-92-9	2.65 U	E8358-FS(0)	1.000	11/9/2022	0.954	2.65	5.30

MW 1/4/23
Analyzed by: Harnden, Kelsey
Printed: 12/28/2022

BATTELLE
It can be done

2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-CF1-EB01-10082022-SO
Battelle ID	E8364-FS
Sample Type	SA
Collection Date	10/08/2022
Extraction Date	10/18/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.262
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.871	2.39	4.77
PFHpA	375-85-9	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.898	2.39	4.77
PFOA	335-67-1	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.964	2.39	4.77
PFNA	375-95-1	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.795	2.39	4.77
PFDA	335-76-2	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.748	2.39	4.77
PFUnA	2058-94-8	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.718	2.39	4.77
PFDoA	307-55-1	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.725	2.39	4.77
PFTrDA	72629-94-8	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.708	2.39	4.77
PFTeDA	376-06-7	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.755	2.39	4.77
NMeFOSAA	2355-31-9	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.983	2.39	4.77
NEtFOSAA	2991-50-6	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.945	2.39	4.77
PFBS	375-73-5	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.826	2.39	4.77
PFHxS	355-46-4	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.951	2.39	4.77
PFOS	1763-23-1	2.39 U	E8364-FS(0)	1.000	11/9/2022	1.02	2.39	4.77
HFPO-DA	13252-13-6	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.825	2.39	4.77
Adona	919005-14-4	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.829	2.39	4.77
9Cl-PF3ONS	756426-58-1	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.983	2.39	4.77
11Cl-PF3OUdS	763051-92-9	2.39 U	E8364-FS(0)	1.000	11/9/2022	0.860	2.39	4.77

NW 1114123

Analyzed by: Harnden, Kelsey
Printed: 12/28/2022

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-1801
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-LFEX-SB01-2728	E8359-FS	Soil
2	NBKK-LFEX-SB04-2627	E8360-FS	Soil
3	NBKK-CF1-SB02-1H2H	E8361-FS	Soil
4	NBKK-CF1-SS01-0001	E8362-FS	Soil
5	NBKK-CF1-SB03-0102	E8363-FS	Soil

A Stage 2B/4 data validation was performed on the analytical data for five soil samples collected on October 6-8, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-LFEX-EB01-100422-SO	None - ND	-	-	-
NBKK-LFEX-FB01-100622	None - ND	-	-	-
NBKK-CF1-EB01-10082022	None - ND	-	-	-
NBKK-CF1-FB01-101322	None - ND	-	-	-

Surrogate Spike Recoveries

- Several samples exhibited low surrogate percent recoveries (%R) for several surrogate compounds. All associated compounds were qualified (J/UJ) in the samples. Please refer to the surrogate summaries on the Form Is for specific recoveries.

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

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It can be done

1

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-SB01-2728
Battelle ID	E8359-FS
Sample Type	SA
Collection Date	10/06/2022
Extraction Date	10/19/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	23.30
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	0.500 U	E8359-FS(0)	1.000	11/15/2022	0.178	0.500	1.00	
PFHpA	**375-85-9**	**0.500 U**	**E8359-FS(0)**	**1.000**	**11/15/2022**	**0.168**	**0.500**	**1.00**	
PFOA	335-67-1	0.500 U	E8359-FS(0)	1.000	11/15/2022	0.214	0.500	1.00	
PFNA	**375-95-1**	**0.500 U**	**E8359-FS(0)**	**1.000**	**11/15/2022**	**0.157**	**0.500**	**1.00**	
PFDA	335-76-2	0.500 U	E8359-FS(0)	1.000	11/15/2022	0.158	0.500	1.00	
PFUnA	**2058-94-8**	**0.500 U**	**E8359-FS(0)**	**1.000**	**11/15/2022**	**0.156**	**0.500**	**1.00**	
PFDoA	307-55-1	0.500 U	E8359-FS(0)	1.000	11/15/2022	0.160	0.500	1.00	
PFTrDA	**72629-94-8**	**0.500 UJ**	**E8359-FS(0)**	**1.000**	**11/15/2022**	**0.161**	**0.500**	**1.00**	SSL
PFTeDA	376-06-7	0.500 UJ	E8359-FS(0)	1.000	11/15/2022	0.162	0.500	2.00	SSL
NMeFOSAA	**2355-31-9**	**0.500 U**	**E8359-FS(0)**	**1.000**	**11/15/2022**	**0.159**	**0.500**	**2.00**	
NEtFOSAA	2991-50-6	0.500 U	E8359-FS(0)	1.000	11/15/2022	0.165	0.500	2.00	
PFBS	**375-73-5**	**0.500 U**	**E8359-FS(0)**	**1.000**	**11/15/2022**	**0.171**	**0.500**	**1.00**	
PFHxS	355-46-4	0.500 U	E8359-FS(0)	1.000	11/15/2022	0.173	0.500	1.00	
PFOS	**1763-23-1**	**0.500 U**	**E8359-FS(0)**	**1.000**	**11/15/2022**	**0.175**	**0.500**	**1.00**	
HFPO-DA	13252-13-6	0.500 U	E8359-FS(0)	1.000	11/15/2022	0.159	0.500	2.00	
Adona	**919005-14-4**	**0.500 U**	**E8359-FS(0)**	**1.000**	**11/15/2022**	**0.160**	**0.500**	**2.00**	
9Cl-PF3ONS	756426-58-1	0.500 U	E8359-FS(0)	1.000	11/15/2022	0.154	0.500	2.00	
11Cl-PF3OUdS	**763051-92-9**	**0.500 U**	**E8359-FS(0)**	**1.000**	**11/15/2022**	**0.150**	**0.500**	**2.00**	

MW 1/19/23

Analyzed by: Lynch, Kimberly
Printed: 12/30/2022

BATTELLE
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1

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-SB01-2728
Battelle ID	E8359-FS
Sample Type	SA
Collection Date	10/06/2022
Extraction Date	10/19/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	68	E8359-FS(0)	11/15/2022
13C4-PFHpA	**69**	**E8359-FS(0)**	**11/15/2022**
13C8-PFOA	71	E8359-FS(0)	11/15/2022
13C9-PFNA	**74**	**E8359-FS(0)**	**11/15/2022**
13C6-PFDA	69	E8359-FS(0)	11/15/2022
13C7-PFUnA	**73**	**E8359-FS(0)**	**11/15/2022**
13C2-PFDoA	66	E8359-FS(0)	11/15/2022
13C2-PFTeDA	**47** M	**E8359-FS(0)**	**11/15/2022**
d3-MeFOSAA	62	E8359-FS(0)	11/15/2022
d5-EtFOSAA	**75**	**E8359-FS(0)**	**11/15/2022**
13C3-PFBS	75	E8359-FS(0)	11/15/2022
13C3-PFHxS	**85**	**E8359-FS(0)**	**11/15/2022**
13C8-PFOS	71	E8359-FS(0)	11/15/2022
13C3-HFPO-DA	**77**	**E8359-FS(0)**	**11/15/2022**

MW 1/19/23
Analyzed by: Lynch, Kimberly
Printed: 12/30/2022

BATTELLE
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2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-SB04-2627
Battelle ID	E8360-FS
Sample Type	SA
Collection Date	10/07/2022
Extraction Date	10/19/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	16.67
Matrix	SOIL
Sample Size	4.990
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	0.501 U	E8360-FS(0)	1.000	11/15/2022	0.178	0.501	1.00	
PFHpA	**375-85-9**	**0.501 U**	**E8360-FS(0)**	**1.000**	**11/15/2022**	**0.168**	**0.501**	**1.00**	
PFOA	335-67-1	0.501 U	E8360-FS(0)	1.000	11/15/2022	0.214	0.501	1.00	
PFNA	**375-95-1**	**0.501 U**	**E8360-FS(0)**	**1.000**	**11/15/2022**	**0.157**	**0.501**	**1.00**	
PFDA	335-76-2	0.501 U	E8360-FS(0)	1.000	11/15/2022	0.158	0.501	1.00	
PFUnA	**2058-94-8**	**0.501 U**	**E8360-FS(0)**	**1.000**	**11/15/2022**	**0.156**	**0.501**	**1.00**	
PFDoA	307-55-1	0.501 U	E8360-FS(0)	1.000	11/15/2022	0.160	0.501	1.00	
PFTrDA	**72629-94-8**	**0.501 UJ**	**E8360-FS(0)**	**1.000**	**11/15/2022**	**0.161**	**0.501**	**1.00**	SSL
PFTeDA	376-06-7	0.501 UJ	E8360-FS(0)	1.000	11/15/2022	0.162	0.501	2.00	SSL
NMeFOSAA	**2355-31-9**	**0.501 U**	**E8360-FS(0)**	**1.000**	**11/15/2022**	**0.159**	**0.501**	**2.00**	
NEtFOSAA	2991-50-6	0.501 U	E8360-FS(0)	1.000	11/15/2022	0.165	0.501	2.00	
PFBS	**375-73-5**	**0.501 U**	**E8360-FS(0)**	**1.000**	**11/15/2022**	**0.171**	**0.501**	**1.00**	
PFHxS	355-46-4	0.501 U	E8360-FS(0)	1.000	11/15/2022	0.173	0.501	1.00	
PFOS	**1763-23-1**	**0.501 U**	**E8360-FS(0)**	**1.000**	**11/15/2022**	**0.175**	**0.501**	**1.00**	
HFPO-DA	13252-13-6	0.501 U	E8360-FS(0)	1.000	11/15/2022	0.159	0.501	2.00	
Adona	**919005-14-4**	**0.501 U**	**E8360-FS(0)**	**1.000**	**11/15/2022**	**0.160**	**0.501**	**2.00**	
9Cl-PF3ONS	756426-58-1	0.501 U	E8360-FS(0)	1.000	11/15/2022	0.154	0.501	2.00	
11Cl-PF3OUdS	**763051-92-9**	**0.501 U**	**E8360-FS(0)**	**1.000**	**11/15/2022**	**0.150**	**0.501**	**2.00**	

MW114123

Analyzed by: Lynch, Kimberly
Printed: 12/30/2022

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2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-SB04-2627
Battelle ID	E8360-FS
Sample Type	SA
Collection Date	10/07/2022
Extraction Date	10/19/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	97	E8360-FS(0)	11/15/2022
13C4-PFHpA	**96**	**E8360-FS(0)**	**11/15/2022**
13C8-PFOA	90	E8360-FS(0)	11/15/2022
13C9-PFNA	**97**	**E8360-FS(0)**	**11/15/2022**
13C6-PFDA	85	E8360-FS(0)	11/15/2022
13C7-PFUnA	**82**	**E8360-FS(0)**	**11/15/2022**
13C2-PFDoA	64	E8360-FS(0)	11/15/2022
13C2-PFTeDA	**45**	**E8360-FS(0)**	**11/15/2022**
d3-MeFOSAA	70	E8360-FS(0)	11/15/2022
d5-EtFOSAA	**63**	**E8360-FS(0)**	**11/15/2022**
13C3-PFBS	101	E8360-FS(0)	11/15/2022
13C3-PFHxS	**97**	**E8360-FS(0)**	**11/15/2022**
13C8-PFOS	104	E8360-FS(0)	11/15/2022
13C3-HFPO-DA	**90**	**E8360-FS(0)**	**11/15/2022**

NW 1/19/23
Analyzed by: Lynch, Kimberly
Printed: 12/30/2022

BATTELLE
It can be done

3

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-CF1-SB02-1H2H
Battelle ID	E8361-FS
Sample Type	SA
Collection Date	10/07/2022
Extraction Date	10/19/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	14.36
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E8361-FS(0)	1.000	11/15/2022	0.178	0.499	0.998
PFHpA	**375-85-9**	**0.499 U**	**E8361-FS(0)**	**1.000**	**11/15/2022**	**0.168**	**0.499**	**0.998**
PFOA	335-67-1	0.286 J	E8361-FS(0)	1.000	11/15/2022	0.214	0.499	0.998
PFNA	**375-95-1**	**0.262 J**	**E8361-FS(0)**	**1.000**	**11/15/2022**	**0.157**	**0.499**	**0.998**
PFDA	335-76-2	0.499 U	E8361-FS(0)	1.000	11/15/2022	0.158	0.499	0.998
PFUnA	**2058-94-8**	**0.499 U**	**E8361-FS(0)**	**1.000**	**11/15/2022**	**0.156**	**0.499**	**0.998**
PFDoA	307-55-1	0.499 U	E8361-FS(0)	1.000	11/15/2022	0.160	0.499	0.998
PFTrDA	**72629-94-8**	**0.499 U**	**E8361-FS(0)**	**1.000**	**11/15/2022**	**0.161**	**0.499**	**0.998**
PFTeDA	376-06-7	0.499 U	E8361-FS(0)	1.000	11/15/2022	0.162	0.499	2.00
NMeFOSAA	**2355-31-9**	**0.499 U**	**E8361-FS(0)**	**1.000**	**11/15/2022**	**0.159**	**0.499**	**2.00**
NEtFOSAA	2991-50-6	0.499 U	E8361-FS(0)	1.000	11/15/2022	0.165	0.499	2.00
PFBS	**375-73-5**	**0.499 U**	**E8361-FS(0)**	**1.000**	**11/15/2022**	**0.171**	**0.499**	**0.998**
PFHxS	355-46-4	0.499 U	E8361-FS(0)	1.000	11/15/2022	0.173	0.499	0.998
PFOS	**1763-23-1**	**1.32**	**E8361-FS(0)**	**1.000**	**11/15/2022**	**0.175**	**0.499**	**0.998**
HFPO-DA	13252-13-6	0.499 U	E8361-FS(0)	1.000	11/15/2022	0.159	0.499	2.00
Adona	**919005-14-4**	**0.499 U**	**E8361-FS(0)**	**1.000**	**11/15/2022**	**0.160**	**0.499**	**2.00**
9Cl-PF3ONS	756426-58-1	0.499 U	E8361-FS(0)	1.000	11/15/2022	0.154	0.499	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.499 U**	**E8361-FS(0)**	**1.000**	**11/15/2022**	**0.150**	**0.499**	**2.00**

MW 111412 3
Analyzed by: Lynch, Kimberly
Printed: 12/30/2022

BATTELLE
It can be done

4

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-CF1-SS01-0001
Battelle ID	E8362-FS
Sample Type	SA
Collection Date	10/08/2022
Extraction Date	10/19/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	9.23
Matrix	SOIL
Sample Size	4.990
Size Unit Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.243 J	E8362-FS(0)	1.000	11/15/2022	0.178	0.501	1.00
PFHpA	**375-85-9**	**0.196 J**	**E8362-FS(0)**	**1.000**	**11/15/2022**	**0.168**	**0.501**	**1.00**
PFOA	335-67-1	0.693 J	E8362-FS(0)	1.000	11/15/2022	0.214	0.501	1.00
PFNA	**375-95-1**	**0.222 J**	**E8362-FS(0)**	**1.000**	**11/15/2022**	**0.157**	**0.501**	**1.00**
PFDA	335-76-2	0.606 J	E8362-FS(0)	1.000	11/15/2022	0.158	0.501	1.00
PFUnA	**2058-94-8**	**0.501 U**	**E8362-FS(0)**	**1.000**	**11/15/2022**	**0.156**	**0.501**	**1.00**
PFDoA	307-55-1	0.241 J	E8362-FS(0)	1.000	11/15/2022	0.160	0.501	1.00
PFTrDA	**72629-94-8**	**0.501 U**	**E8362-FS(0)**	**1.000**	**11/15/2022**	**0.161**	**0.501**	**1.00**
PFTeDA	376-06-7	0.501 U	E8362-FS(0)	1.000	11/15/2022	0.162	0.501	2.00
NMeFOSAA	**2355-31-9**	**0.501 U**	**E8362-FS(0)**	**1.000**	**11/15/2022**	**0.159**	**0.501**	**2.00**
NEtFOSAA	2991-50-6	0.501 U	E8362-FS(0)	1.000	11/15/2022	0.165	0.501	2.00
PFBS	**375-73-5**	**0.501 U**	**E8362-FS(0)**	**1.000**	**11/15/2022**	**0.171**	**0.501**	**1.00**
PFHxS	355-46-4	0.501 U	E8362-FS(0)	1.000	11/15/2022	0.173	0.501	1.00
PFOS	**1763-23-1**	**1.94**	**E8362-FS(0)**	**1.000**	**11/15/2022**	**0.175**	**0.501**	**1.00**
HFPO-DA	13252-13-6	0.501 U	E8362-FS(0)	1.000	11/15/2022	0.159	0.501	2.00
Adona	**919005-14-4**	**0.501 U**	**E8362-FS(0)**	**1.000**	**11/15/2022**	**0.160**	**0.501**	**2.00**
9Cl-PF3ONS	756426-58-1	0.501 U	E8362-FS(0)	1.000	11/15/2022	0.154	0.501	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.501 U**	**E8362-FS(0)**	**1.000**	**11/15/2022**	**0.150**	**0.501**	**2.00**

BATTELLE
R can be done

5

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-CF1-SB03-0102
Battelle ID	E8363-FS
Sample Type	SA
Collection Date	10/08/2022
Extraction Date	10/19/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	16.10
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E8363-FS(0)	1.000	11/15/2022	0.178	0.499	0.998
PFHpA	**375-85-9**	**0.499 U**	**E8363-FS(0)**	**1.000**	**11/15/2022**	**0.168**	**0.499**	**0.998**
PFOA	335-67-1	0.339 J	E8363-FS(0)	1.000	11/15/2022	0.214	0.499	0.998
PFNA	**375-95-1**	**0.499 U**	**E8363-FS(0)**	**1.000**	**11/15/2022**	**0.157**	**0.499**	**0.998**
PFDA	335-76-2	0.499 U	E8363-FS(0)	1.000	11/15/2022	0.158	0.499	0.998
PFUnA	**2058-94-8**	**0.499 U**	**E8363-FS(0)**	**1.000**	**11/15/2022**	**0.156**	**0.499**	**0.998**
PFDoA	307-55-1	0.499 U	E8363-FS(0)	1.000	11/15/2022	0.160	0.499	0.998
PFTrDA	**72629-94-8**	**0.499 U**	**E8363-FS(0)**	**1.000**	**11/15/2022**	**0.161**	**0.499**	**0.998**
PFTeDA	376-06-7	0.499 U	E8363-FS(0)	1.000	11/15/2022	0.162	0.499	2.00
NMeFOSAA	**2355-31-9**	**0.499 U**	**E8363-FS(0)**	**1.000**	**11/15/2022**	**0.159**	**0.499**	**2.00**
NEtFOSAA	2991-50-6	0.499 U	E8363-FS(0)	1.000	11/15/2022	0.165	0.499	2.00
PFBS	**375-73-5**	**0.499 U**	**E8363-FS(0)**	**1.000**	**11/15/2022**	**0.171**	**0.499**	**0.998**
PFHxS	355-46-4	0.499 U	E8363-FS(0)	1.000	11/15/2022	0.173	0.499	0.998
PFOS	**1763-23-1**	**0.499 U**	**E8363-FS(0)**	**1.000**	**11/15/2022**	**0.175**	**0.499**	**0.998**
HFPO-DA	13252-13-6	0.499 U	E8363-FS(0)	1.000	11/15/2022	0.159	0.499	2.00
Adona	**919005-14-4**	**0.499 U**	**E8363-FS(0)**	**1.000**	**11/15/2022**	**0.160**	**0.499**	**2.00**
9Cl-PF3ONS	756426-58-1	0.499 U	E8363-FS(0)	1.000	11/15/2022	0.154	0.499	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.499 U**	**E8363-FS(0)**	**1.000**	**11/15/2022**	**0.150**	**0.499**	**2.00**

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client:	CH2M HILL, Inc., Corvallis, Oregon
SDG:	22-1835
Laboratory:	Battelle Norwell Operations, Norwell, Massachusetts
Site:	Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date:	March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-B1006-FB01-101122	E8544-FS	Water
2	NBKK-CF1-FB01-101322	E8545-FS	Water

A Stage 2B/4 data validation was performed on the analytical data for two aqueous field blank samples collected on October 11-13, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning

- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-B1006-FB01-101122	None - ND	-	-	-
NBKK-CF1-FB01-101322	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B1006-FB01-101122
Battelle ID	E8544-FS
Sample Type	SA
Collection Date	10/11/2022
Extraction Date	10/25/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.257
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.43 U	E8544-FS(0)	1.000	11/17/2022	0.888	2.43	4.86
PFHpA	**375-85-9**	**2.43 U**	**E8544-FS(0)**	**1.000**	**11/17/2022**	**0.915**	**2.43**	**4.86**
PFOA	335-67-1	2.43 U	E8544-FS(0)	1.000	11/17/2022	0.982	2.43	4.86
PFNA	**375-95-1**	**2.43 U**	**E8544-FS(0)**	**1.000**	**11/17/2022**	**0.810**	**2.43**	**4.86**
PFDA	335-76-2	2.43 U	E8544-FS(0)	1.000	11/17/2022	0.763	2.43	4.86
PFUnA	**2058-94-8**	**2.43 U**	**E8544-FS(0)**	**1.000**	**11/17/2022**	**0.732**	**2.43**	**4.86**
PFDoA	307-55-1	2.43 U	E8544-FS(0)	1.000	11/17/2022	0.739	2.43	4.86
PFTrDA	**72629-94-8**	**2.43 U**	**E8544-FS(0)**	**1.000**	**11/17/2022**	**0.722**	**2.43**	**4.86**
PFTeDA	376-06-7	2.43 U	E8544-FS(0)	1.000	11/17/2022	0.769	2.43	4.86
NMeFOSAA	**2355-31-9**	**2.43 U**	**E8544-FS(0)**	**1.000**	**11/17/2022**	**1.00**	**2.43**	**4.86**
NEtFOSAA	2991-50-6	2.43 U	E8544-FS(0)	1.000	11/17/2022	0.963	2.43	4.86
PFBS	**375-73-5**	**2.43 U**	**E8544-FS(0)**	**1.000**	**11/17/2022**	**0.842**	**2.43**	**4.86**
PFHxS	355-46-4	2.43 U	E8544-FS(0)	1.000	11/17/2022	0.970	2.43	4.86
PFOS	**1763-23-1**	**2.43 U**	**E8544-FS(0)**	**1.000**	**11/17/2022**	**1.04**	**2.43**	**4.86**
HFPO-DA	13252-13-6	2.43 U	E8544-FS(0)	1.000	11/17/2022	0.841	2.43	4.86
Adona	**919005-14-4**	**2.43 U**	**E8544-FS(0)**	**1.000**	**11/17/2022**	**0.845**	**2.43**	**4.86**
9Cl-PF3ONS	756426-58-1	2.43 U	E8544-FS(0)	1.000	11/17/2022	1.00	2.43	4.86
11Cl-PF3OUdS	**763051-92-9**	**2.43 U**	**E8544-FS(0)**	**1.000**	**11/17/2022**	**0.876**	**2.43**	**4.86**

MW 1/19/23
Analyzed by: Harnden, Kelsey
Printed: 1/6/2023

BATTELLE
It can be done

2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-CF1-FB01-101322
Battelle ID	E8545-FS
Sample Type	SA
Collection Date	10/13/2022
Extraction Date	10/25/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.248
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.52 U	E8545-FS(0)	1.000	11/17/2022	0.920	2.52	5.04
PFHpA	375-85-9	2.52 U	E8545-FS(0)	1.000	11/17/2022	0.949	2.52	5.04
PFOA	335-67-1	2.52 U	E8545-FS(0)	1.000	11/17/2022	1.02	2.52	5.04
PFNA	375-95-1	2.52 U	E8545-FS(0)	1.000	11/17/2022	0.840	2.52	5.04
PFDA	335-76-2	2.52 U	E8545-FS(0)	1.000	11/17/2022	0.790	2.52	5.04
PFUnA	2058-94-8	2.52 U	E8545-FS(0)	1.000	11/17/2022	0.758	2.52	5.04
PFDoA	307-55-1	2.52 U	E8545-FS(0)	1.000	11/17/2022	0.766	2.52	5.04
PFTrDA	72629-94-8	2.52 U	E8545-FS(0)	1.000	11/17/2022	0.748	2.52	5.04
PFTeDA	376-06-7	2.52 U	E8545-FS(0)	1.000	11/17/2022	0.797	2.52	5.04
NMeFOSAA	2355-31-9	2.52 U	E8545-FS(0)	1.000	11/17/2022	1.04	2.52	5.04
NEtFOSAA	2991-50-6	2.52 U	E8545-FS(0)	1.000	11/17/2022	0.998	2.52	5.04
PFBS	375-73-5	2.52 U	E8545-FS(0)	1.000	11/17/2022	0.873	2.52	5.04
PFHxS	355-46-4	2.52 U	E8545-FS(0)	1.000	11/17/2022	1.01	2.52	5.04
PFOS	1763-23-1	2.52 U	E8545-FS(0)	1.000	11/17/2022	1.08	2.52	5.04
HFPO-DA	13252-13-6	2.52 U	E8545-FS(0)	1.000	11/17/2022	0.872	2.52	5.04
Adona	919005-14-4	2.52 U	E8545-FS(0)	1.000	11/17/2022	0.876	2.52	5.04
9Cl-PF3ONS	756426-58-1	2.52 U	E8545-FS(0)	1.000	11/17/2022	1.04	2.52	5.04
11Cl-PF3OUdS	763051-92-9	2.52 U	E8545-FS(0)	1.000	11/17/2022	0.908	2.52	5.04

MW 1/19/23

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-1836
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-CF1-SB01-5152	E8546-FS	Soil
2	NBKK-CF1-SB03-5253	E8547-FS	Soil

A Stage 2B/4 data validation was performed on the analytical data for two soil samples collected on October 13-15, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning

- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-CF1-EB01-10082022	None - ND	-	-	-
NBKK-CF1-FB01-101322	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-CF1-SB01-5152
Battelle ID	E8546-FS
Sample Type	SA
Collection Date	10/13/2022
Extraction Date	10/24/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	7.59
Matrix	SOIL
Sample Size	4.990
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.178	0.501	1.00
PFHpA	375-85-9	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.168	0.501	1.00
PFOA	335-67-1	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.214	0.501	1.00
PFNA	375-95-1	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.157	0.501	1.00
PFDA	335-76-2	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.158	0.501	1.00
PFUnA	2058-94-8	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.156	0.501	1.00
PFDoA	307-55-1	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.160	0.501	1.00
PFTrDA	72629-94-8	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.161	0.501	1.00
PFTeDA	376-06-7	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.162	0.501	2.00
NMeFOSAA	2355-31-9	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.159	0.501	2.00
NEtFOSAA	2991-50-6	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.165	0.501	2.00
PFBS	375-73-5	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.171	0.501	1.00
PFHxS	355-46-4	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.173	0.501	1.00
PFOS	1763-23-1	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.175	0.501	1.00
HFPO-DA	13252-13-6	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.159	0.501	2.00
Adona	919005-14-4	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.160	0.501	2.00
9Cl-PF3ONS	756426-58-1	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.154	0.501	2.00
11Cl-PF3OUdS	763051-92-9	0.501 U	E8546-FS(0)	1.000	11/19/2022	0.150	0.501	2.00

BATTELLE
It can be done

2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-CF1-SB03-5253
Battelle ID	E8547-FS
Sample Type	SA
Collection Date	10/15/2022
Extraction Date	10/24/2022
Analytical Instrument	Sciex 6500- (AE) LC/MS/MS
% Moisture	6.02
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	E8547-FS(0)	1.000	11/19/2022	0.178	0.500	1.00
PFHpA	**375-85-9**	**0.500 U**	**E8547-FS(0)**	**1.000**	**11/19/2022**	**0.168**	**0.500**	**1.00**
PFOA	335-67-1	0.500 U	E8547-FS(0)	1.000	11/19/2022	0.214	0.500	1.00
PFNA	**375-95-1**	**0.500 U**	**E8547-FS(0)**	**1.000**	**11/19/2022**	**0.157**	**0.500**	**1.00**
PFDA	335-76-2	0.500 U	E8547-FS(0)	1.000	11/19/2022	0.158	0.500	1.00
PFUnA	**2058-94-8**	**0.500 U**	**E8547-FS(0)**	**1.000**	**11/19/2022**	**0.156**	**0.500**	**1.00**
PFDoA	307-55-1	0.500 U	E8547-FS(0)	1.000	11/19/2022	0.160	0.500	1.00
PFTrDA	**72629-94-8**	**0.500 U**	**E8547-FS(0)**	**1.000**	**11/19/2022**	**0.161**	**0.500**	**1.00**
PFTeDA	376-06-7	0.500 U	E8547-FS(0)	1.000	11/19/2022	0.162	0.500	2.00
NMeFOSAA	**2355-31-9**	**0.500 U**	**E8547-FS(0)**	**1.000**	**11/19/2022**	**0.159**	**0.500**	**2.00**
NEtFOSAA	2991-50-6	0.500 U	E8547-FS(0)	1.000	11/19/2022	0.165	0.500	2.00
PFBS	**375-73-5**	**0.500 U**	**E8547-FS(0)**	**1.000**	**11/19/2022**	**0.171**	**0.500**	**1.00**
PFHxS	355-46-4	0.500 U	E8547-FS(0)	1.000	11/19/2022	0.173	0.500	1.00
PFOS	**1763-23-1**	**0.500 U**	**E8547-FS(0)**	**1.000**	**11/19/2022**	**0.175**	**0.500**	**1.00**
HFPO-DA	13252-13-6	0.500 U	E8547-FS(0)	1.000	11/19/2022	0.159	0.500	2.00
Adona	**919005-14-4**	**0.500 U**	**E8547-FS(0)**	**1.000**	**11/19/2022**	**0.160**	**0.500**	**2.00**
9Cl-PF3ONS	756426-58-1	0.500 U	E8547-FS(0)	1.000	11/19/2022	0.154	0.500	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.500 U**	**E8547-FS(0)**	**1.000**	**11/19/2022**	**0.150**	**0.500**	**2.00**

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-1925
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-S7-FB01-102622	E9290-FS	Water

A Stage 2B/4 data validation was performed on the analytical data for one aqueous field blank sample collected on October 26, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries

- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-S7-FB01-102622	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-S7-FB01-102622
Battelle ID	E9290-FS
Sample Type	SA
Collection Date	10/26/2022
Extraction Date	11/03/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.260
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.40 U	E9290-FS(0)	1.000	12/1/2022	0.878	2.40	4.81
PFHpA	**375-85-9**	**2.40 U**	**E9290-FS(0)**	**1.000**	**12/1/2022**	**0.905**	**2.40**	**4.81**
PFOA	335-67-1	2.40 U	E9290-FS(0)	1.000	12/1/2022	0.971	2.40	4.81
PFNA	**375-95-1**	**2.40 U**	**E9290-FS(0)**	**1.000**	**12/1/2022**	**0.801**	**2.40**	**4.81**
PFDA	335-76-2	2.40 U	E9290-FS(0)	1.000	12/1/2022	0.754	2.40	4.81
PFUnA	**2058-94-8**	**2.40 U**	**E9290-FS(0)**	**1.000**	**12/1/2022**	**0.723**	**2.40**	**4.81**
PFDoA	307-55-1	2.40 U	E9290-FS(0)	1.000	12/1/2022	0.731	2.40	4.81
PFTrDA	**72629-94-8**	**2.40 U**	**E9290-FS(0)**	**1.000**	**12/1/2022**	**0.713**	**2.40**	**4.81**
PFTeDA	376-06-7	2.40 U	E9290-FS(0)	1.000	12/1/2022	0.761	2.40	4.81
NMeFOSAA	**2355-31-9**	**2.40 U**	**E9290-FS(0)**	**1.000**	**12/1/2022**	**0.990**	**2.40**	**4.81**
NEtFOSAA	2991-50-6	2.40 U	E9290-FS(0)	1.000	12/1/2022	0.952	2.40	4.81
PFBS	**375-73-5**	**2.40 U**	**E9290-FS(0)**	**1.000**	**12/1/2022**	**0.833**	**2.40**	**4.81**
PFHxS	355-46-4	2.40 U	E9290-FS(0)	1.000	12/1/2022	0.959	2.40	4.81
PFOS	**1763-23-1**	**2.40 U**	**E9290-FS(0)**	**1.000**	**12/1/2022**	**1.03**	**2.40**	**4.81**
HFPO-DA	13252-13-6	2.40 U	E9290-FS(0)	1.000	12/1/2022	0.832	2.40	4.81
Adona	**919005-14-4**	**2.40 U**	**E9290-FS(0)**	**1.000**	**12/1/2022**	**0.836**	**2.40**	**4.81**
9Cl-PF3ONS	756426-58-1	2.40 U	E9290-FS(0)	1.000	12/1/2022	0.990	2.40	4.81
11Cl-PF3OUdS	**763051-92-9**	**2.40 U**	**E9290-FS(0)**	**1.000**	**12/1/2022**	**0.866**	**2.40**	**4.81**

MW 3/6/23

Analyzed by: Harnden, Kelsey
Printed: 1/17/2023

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-1926
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

NBKK-S7-SB04-0102

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-S7-SB04-0102	E9287-FS	Soil
2	NBKK-S7-SB04-0910	E9288-FS	Soil
3	NBKK-S7-SB05-0102	E9289-FS	Soil
4	NBKK-S7-SB05-0910	E9291-FS	Soil

A Stage 2B/4 data validation was performed on the analytical data for four soil samples collected on October 25-26, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-S7-EB01-102722-SO	None - ND	-	-	-
NBKK-S7-FB01-102622	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

BATTELLE
It can be done

1

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-S7-SB04-0102
Battelle ID	E9287-FS
Sample Type	SA
Collection Date	10/25/2022
Extraction Date	11/04/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS
% Moisture	8.06
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E9287-FS(0)	1.000	12/2/2022	0.178	0.499	0.998
PFHpA	**375-85-9**	**0.499 U**	**E9287-FS(0)**	**1.000**	**12/2/2022**	**0.168**	**0.499**	**0.998**
PFOA	335-67-1	0.499 U	E9287-FS(0)	1.000	12/2/2022	0.214	0.499	0.998
PFNA	**375-95-1**	**0.499 U**	**E9287-FS(0)**	**1.000**	**12/2/2022**	**0.157**	**0.499**	**0.998**
PFDA	335-76-2	0.499 U	E9287-FS(0)	1.000	12/2/2022	0.158	0.499	0.998
PFUnA	**2058-94-8**	**0.499 U**	**E9287-FS(0)**	**1.000**	**12/2/2022**	**0.156**	**0.499**	**0.998**
PFDoA	307-55-1	0.499 U	E9287-FS(0)	1.000	12/2/2022	0.160	0.499	0.998
PFTrDA	**72629-94-8**	**0.499 U**	**E9287-FS(0)**	**1.000**	**12/2/2022**	**0.161**	**0.499**	**0.998**
PFTeDA	376-06-7	0.499 U	E9287-FS(0)	1.000	12/2/2022	0.162	0.499	2.00
NMeFOSAA	**2355-31-9**	**0.499 U**	**E9287-FS(0)**	**1.000**	**12/2/2022**	**0.159**	**0.499**	**2.00**
NEtFOSAA	2991-50-6	0.499 U	E9287-FS(0)	1.000	12/2/2022	0.165	0.499	2.00
PFBS	**375-73-5**	**0.499 U**	**E9287-FS(0)**	**1.000**	**12/2/2022**	**0.171**	**0.499**	**0.998**
PFHxS	355-46-4	0.499 U	E9287-FS(0)	1.000	12/2/2022	0.173	0.499	0.998
PFOS	**1763-23-1**	**0.223 J**	**E9287-FS(0)**	**1.000**	**12/2/2022**	**0.175**	**0.499**	**0.998**
HFPO-DA	13252-13-6	0.499 U	E9287-FS(0)	1.000	12/2/2022	0.159	0.499	2.00
Adona	**919005-14-4**	**0.499 U**	**E9287-FS(0)**	**1.000**	**12/2/2022**	**0.160**	**0.499**	**2.00**
9Cl-PF3ONS	756426-58-1	0.499 U	E9287-FS(0)	1.000	12/2/2022	0.154	0.499	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.499 U**	**E9287-FS(0)**	**1.000**	**12/2/2022**	**0.150**	**0.499**	**2.00**

BATTELLE
It can be done

2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-S7-SB04-0910
Battelle ID	E9288-FS
Sample Type	SA
Collection Date	10/25/2022
Extraction Date	11/04/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS
% Moisture	9.92
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.173	0.500	1.00
PFOS	1763-23-1	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	E9288-FS(0)	1.000	12/2/2022	0.150	0.500	2.00

BATTELLE
It can be done

3

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-S7-SB05-0102
Battelle ID	E9289-FS
Sample Type	SA
Collection Date	10/26/2022
Extraction Date	11/04/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS
% Moisture	3.85
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.173	0.499	0.998
PFOS	1763-23-1	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	E9289-FS(0)	1.000	12/2/2022	0.150	0.499	2.00

MJ 1.19.23
Analyzed by: Urso, Vincent

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

4

Client ID	NBKK-S7-SB05-0910
Battelle ID	E9291-FS
Sample Type	SA
Collection Date	10/26/2022
Extraction Date	11/04/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS
% Moisture	3.20
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.173	0.500	1.00
PFOS	1763-23-1	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	E9291-FS(0)	1.000	12/2/2022	0.150	0.500	2.00

NW 1/19/23
Analyzed by: Urso, Vincent
Printed: 12/2/2022

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-1944
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-S7-SS02-0001	E9341-FS	Soil
1MS	NBKK-S7-SS02-0001MS	E9342-FSMS	Soil
1MSD	NBKK-S7-SS02-0001MSD	E9343-FSMSD	Soil
2	NBKK-S7-SB02-1011	E9345-FS	Soil
3	NBKK-S7-SB01-0102	E9346-FS	Soil

A Stage 2B/4 data validation was performed on the analytical data for three soil samples collected on October 27-28, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- The compound PFTeDA was reanalyzed outside the 28-day holding time and was flagged (T) by the laboratory. However, the extracts were stored per draft method EPA Method 1633 which allows for a 90-day holding time. The (T) flags were removed.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-S7-EB01-102722-SO	None - ND	-	-	-
NBKK-S7-FB01-102622	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample	Compound	MS %R/MSD %R/RPD	Qualifier
1	PFUnA	142%/OK/OK	None - Sample ND

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-S7-SS02-0001
Battelle ID	E9341-FS
Sample Type	SA
Collection Date	10/27/2022
Extraction Date	11/08/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	4.36
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E9341-FS(0)	1.000	12/2/2022	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	E9341-FS(0)	1.000	12/2/2022	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	E9341-FS(0)	1.000	12/2/2022	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	E9341-FS(0)	1.000	12/2/2022	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	E9341-FS(0)	1.000	12/2/2022	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	E9341-FS(0)	1.000	12/2/2022	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	E9341-FS(0)	1.000	12/2/2022	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	E9341-FS(0)	1.000	12/2/2022	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	E9341-FS(0)	1.000	12/2/2022	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	E9341-FS(0)	1.000	12/2/2022	0.159	0.499	2.00
NEtFOSAA	2991 50 6	0.499 U	E9341 FS(0)	1.000	12/2/2022	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	E9341-FS(0)	1.000	12/2/2022	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	E9341-FS(0)	1.000	12/2/2022	0.173	0.499	0.998
PFOS	1763-23-1	0.290 J	E9341-FS(0)	1.000	12/2/2022	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	E9341-FS(0)	1.000	12/2/2022	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	E9341-FS(0)	1.000	12/2/2022	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	E9341-FS(0)	1.000	12/2/2022	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	E9341-FS(0)	1.000	12/2/2022	0.150	0.499	2.00

MW 1/19/23

BATTELLE
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2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-S7-SB02-1011
Battelle ID	E9345-FS
Sample Type	SA
Collection Date	10/27/2022
Extraction Date	11/08/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	3.52
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	E9345-FS(0)	1.000	12/2/2022	0.178	0.500	1.00
PFHpA	**375-85-9**	**0.500 U**	**E9345-FS(0)**	**1.000**	**12/2/2022**	**0.168**	**0.500**	**1.00**
PFOA	335-67-1	0.500 U	E9345-FS(0)	1.000	12/2/2022	0.214	0.500	1.00
PFNA	**375-95-1**	**0.500 U**	**E9345-FS(0)**	**1.000**	**12/2/2022**	**0.157**	**0.500**	**1.00**
PFDA	335-76-2	0.500 U	E9345-FS(0)	1.000	12/2/2022	0.158	0.500	1.00
PFUnA	**2058-94-8**	**0.500 U**	**E9345-FS(0)**	**1.000**	**12/2/2022**	**0.156**	**0.500**	**1.00**
PFDoA	307-55-1	0.500 U	E9345-FS(0)	1.000	12/2/2022	0.160	0.500	1.00
PFTrDA	**72629-94-8**	**0.500 U**	**E9345-FS(0)**	**1.000**	**12/2/2022**	**0.161**	**0.500**	**1.00**
PFTeDA	376-06-7	0.500 U	E9345-FS(0)	1.000	12/6/2022	0.162	0.500	2.00
NMeFOSAA	**2355-31-9**	**0.500 U**	**E9345-FS(0)**	**1.000**	**12/2/2022**	**0.159**	**0.500**	**2.00**
NEtFOSAA	2991-50-6	0.500 U	E9345-FS(0)	1.000	12/2/2022	0.165	0.500	2.00
PFBS	**375-73-5**	**0.500 U**	**E9345-FS(0)**	**1.000**	**12/2/2022**	**0.171**	**0.500**	**1.00**
PFHxS	355-46-4	0.500 U	E9345-FS(0)	1.000	12/2/2022	0.173	0.500	1.00
PFOS	**1763-23-1**	**0.500 U**	**E9345-FS(0)**	**1.000**	**12/2/2022**	**0.175**	**0.500**	**1.00**
HFPO-DA	13252-13-6	0.500 U	E9345-FS(0)	1.000	12/2/2022	0.159	0.500	2.00
Adona	**919005-14-4**	**0.500 U**	**E9345-FS(0)**	**1.000**	**12/2/2022**	**0.160**	**0.500**	**2.00**
9Cl-PF3ONS	756426-58-1	0.500 U	E9345-FS(0)	1.000	12/2/2022	0.154	0.500	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.500 U**	**E9345-FS(0)**	**1.000**	**12/2/2022**	**0.150**	**0.500**	**2.00**

NW 1/14/23

BATTELLE
It can be done

3

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-S7-SB01-0102
Battelle ID	E9346-FS
Sample Type	SA
Collection Date	10/28/2022
Extraction Date	11/08/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	4.06
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.173	0.499	0.998
PFOS	1763-23-1	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	E9346-FS(0)	1.000	12/2/2022	0.150	0.499	2.00

NW 1/14/23
Analyzed by: Urso, Vincent

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-1946
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-S7-EB01-102722-SO	E9344-FS	Water

A Stage 2B/4 data validation was performed on the analytical data for one aqueous equipment blank sample collected on October 27, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries

- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-S7-EB01-102722-SO	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

BATTELLE
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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-S7-EB01-102722-SO
Battelle ID	E9344-FS
Sample Type	SA
Collection Date	10/27/2022
Extraction Date	11/07/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.276
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.827	2.26	4.53
PFHpA	375-85-9	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.852	2.26	4.53
PFOA	335-67-1	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.915	2.26	4.53
PFNA	375-95-1	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.755	2.26	4.53
PFDA	335-76-2	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.710	2.26	4.53
PFUnA	2058-94-8	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.681	2.26	4.53
PFDoA	307-55-1	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.688	2.26	4.53
PFTrDA	72629-94-8	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.672	2.26	4.53
PFTeDA	376-06-7	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.716	2.26	4.53
NMeFOSAA	2355-31-9	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.933	2.26	4.53
NEtFOSAA	2991-50-6	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.897	2.26	4.53
PFBS	375-73-5	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.784	2.26	4.53
PFHxS	355-46-4	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.903	2.26	4.53
PFOS	1763-23-1	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.969	2.26	4.53
HFPO-DA	13252-13-6	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.784	2.26	4.53
Adona	919005-14-4	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.787	2.26	4.53
9Cl-PF3ONS	756426-58-1	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.933	2.26	4.53
11Cl-PF3OUdS	763051-92-9	2.26 U	E9344-FS(0)	1.000	12/3/2022	0.816	2.26	4.53

MW 3/6/23
Analyzed by: Harnden, Kelsey

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-1986
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-S7-SB01-0809	E9604-FS	Soil
2	NBKK-OU2A5-SB02-2930	E9605-FS	Soil
3	NBKK-OU2A5-SB02P-2930	E9606-FS	Soil
4	NBKK-OU2A5-SB01-3637	E9607-FS	Soil
5	NBKK-OU2A5-SB05-0203	E9608-FS	Soil
6	NBKK-OU2A5-SB05-1011	E9609-FS	Soil
7	NBKK-OU2A5-SB04-0203	E9610-FS	Soil
8	NBKK-OU2A5-SB04-0506	E9611-FS	Soil
9	NBKK-CF1-SS02-0H01	E9612-FS	Soil

A Stage 2B/4 data validation was performed on the analytical data for nine soil samples collected on October 28-November 1, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- The samples were analyzed outside of holding time and were flagged (T) by the laboratory. However, the extracts were stored per draft method EPA Method 1633 which allows for a 90-day holding time. The (T) flags were removed.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-S7-EB01-102722-SO	None - ND	-	-	-
NBKK-S7-FB01-102622	None - ND	-	-	-

Surrogate Spike Recoveries

- Several samples exhibited low surrogate percent recoveries (%R) for several surrogate compounds. All associated compounds were qualified (UJ) in the samples. Please refer to the surrogate summaries on the Form Is for specific recoveries.

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	NBKK-OU2A5-SB02-2930 ng/g	NBKK-OU2A5-SB02P-2930 ng/g	RPD	Qualifier
None	ND	ND	-	-

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

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1

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-S7-SB01-0809
Battelle ID	E9604-FS
Sample Type	SA
Collection Date	10/28/2022
Extraction Date	11/09/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	3.16
Matrix	SO
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.173	0.499	0.998
PFOS	1763-23-1	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	E9604-FS(0)	1.000	12/6/2022	0.150	0.499	2.00

BATTELLE
R can be done

2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A5-SB02-2930
Battelle ID	E9605-FS
Sample Type	SA
Collection Date	10/29/2022
Extraction Date	11/09/2022
Analytical Instrument	Sciex 6500- (AE) LC/MS/MS
% Moisture	6.45
Matrix	SO
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	E9605-FS(0)	1.000	12/6/2022	0.178	0.500	1.00
PFHpA	**375-85-9**	**0.500 U**	**E9605-FS(0)**	**1.000**	**12/6/2022**	**0.168**	**0.500**	**1.00**
PFOA	335-67-1	0.500 U	E9605-FS(0)	1.000	12/6/2022	0.214	0.500	1.00
PFNA	**375-95-1**	**0.500 U**	**E9605-FS(0)**	**1.000**	**12/6/2022**	**0.157**	**0.500**	**1.00**
PFDA	335-76-2	0.500 U	E9605-FS(0)	1.000	12/6/2022	0.158	0.500	1.00
PFUnA	**2058-94-8**	**0.500 U**	**E9605-FS(0)**	**1.000**	**12/6/2022**	**0.156**	**0.500**	**1.00**
PFDoA	307-55-1	0.500 U	E9605-FS(0)	1.000	12/6/2022	0.160	0.500	1.00
PFTrDA	**72629-94-8**	**0.500 U**	**E9605-FS(0)**	**1.000**	**12/6/2022**	**0.161**	**0.500**	**1.00**
PFTeDA	376-06-7	0.500 U	E9605-FS(0)	1.000	12/6/2022	0.162	0.500	2.00
NMeFOSAA	**2355-31-9**	**0.500 U**	**E9605-FS(0)**	**1.000**	**12/6/2022**	**0.159**	**0.500**	**2.00**
NEtFOSAA	2991-50-6	0.500 U	E9605-FS(0)	1.000	12/6/2022	0.165	0.500	2.00
PFBS	**375-73-5**	**0.500 U**	**E9605-FS(0)**	**1.000**	**12/6/2022**	**0.171**	**0.500**	**1.00**
PFHxS	355-46-4	0.500 U	E9605-FS(0)	1.000	12/6/2022	0.173	0.500	1.00
PFOS	**1763-23-1**	**0.500 U**	**E9605-FS(0)**	**1.000**	**12/6/2022**	**0.175**	**0.500**	**1.00**
HFPO-DA	13252-13-6	0.500 U	E9605-FS(0)	1.000	12/6/2022	0.159	0.500	2.00
Adona	**919005-14-4**	**0.500 U**	**E9605-FS(0)**	**1.000**	**12/6/2022**	**0.160**	**0.500**	**2.00**
9Cl-PF3ONS	756426-58-1	0.500 U	E9605-FS(0)	1.000	12/6/2022	0.154	0.500	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.500 U**	**E9605-FS(0)**	**1.000**	**12/6/2022**	**0.150**	**0.500**	**2.00**

MW 3/6/23
Analyzed by: Harnden, Kelsey
Printed: 1/27/2023

BATTELLE
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3

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A5-SB02P-2930
Battelle ID	E9606-FS
Sample Type	SA
Collection Date	10/29/2022
Extraction Date	11/09/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	6.51
Matrix	SO
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.173	0.499	0.998
PFOS	1763-23-1	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	E9606-FS(0)	1.000	12/6/2022	0.150	0.499	2.00

NV 3/6/23

BATTELLE
It can be done

4

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A5-SB01-3637
Battelle ID	E9607-FS
Sample Type	SA
Collection Date	10/31/2022
Extraction Date	11/09/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	5.81
Matrix	SO
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.173	0.500	1.00
PFOS	1763-23-1	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	E9607-FS(0)	1.000	12/6/2022	0.150	0.500	2.00

NW 3/6/23

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A5-SB05-0203
Battelle ID	E9608-FS
Sample Type	SA
Collection Date	11/01/2022
Extraction Date	11/09/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	7.57
Matrix	SO
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	0.500 U	E9608-FS(0)	1.000	12/6/2022	0.178	0.500	1.00	
PFHpA	375-85-9	0.500 U	E9608-FS(0)	1.000	12/6/2022	0.168	0.500	1.00	
PFOA	335-67-1	0.500 U	E9608-FS(0)	1.000	12/6/2022	0.214	0.500	1.00	
PFNA	375-95-1	0.500 U	E9608-FS(0)	1.000	12/6/2022	0.157	0.500	1.00	
PFDA	335-76-2	0.500 U	E9608-FS(0)	1.000	12/6/2022	0.158	0.500	1.00	
PFUnA	2058-94-8	0.500 U	E9608-FS(0)	1.000	12/6/2022	0.156	0.500	1.00	
PFDoA	307-55-1	0.500 U	E9608-FS(0)	1.000	12/6/2022	0.160	0.500	1.00	
PFTrDA	72629-94-8	0.500 UJ	E9608-FS(0)	1.000	12/6/2022	0.161	0.500	1.00	SSL
PFTeDA	376-06-7	0.500 UJ	E9608-FS(0)	1.000	12/6/2022	0.162	0.500	2.00	SSL
NMeFOSAA	2355-31-9	0.500 U	E9608-FS(0)	1.000	12/6/2022	0.159	0.500	2.00	
NEtFOSAA	2991-50-6	0.500 U	E9608-FS(0)	1.000	12/6/2022	0.165	0.500	2.00	
PFBS	375-73-5	0.500 U	E9608-FS(0)	1.000	12/6/2022	0.171	0.500	1.00	
PFHxS	355-46-4	0.500 U	E9608-FS(0)	1.000	12/6/2022	0.173	0.500	1.00	
PFOS	1763-23-1	0.500 U	E9608-FS(0)	1.000	12/6/2022	0.175	0.500	1.00	
HFPO-DA	13252-13-6	0.500 U	E9608-FS(0)	1.000	12/6/2022	0.159	0.500	2.00	
Adona	919005-14-4	0.500 U	E9608-FS(0)	1.000	12/6/2022	0.160	0.500	2.00	
9Cl-PF3ONS	756426-58-1	0.500 U	E9608-FS(0)	1.000	12/6/2022	0.154	0.500	2.00	
11Cl-PF3OUdS	763051-92-9	0.500 U	E9608-FS(0)	1.000	12/6/2022	0.150	0.500	2.00	

MW 3/6/23

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161-X1-XX-0026-000001

Client ID	NBKK-OU2A5-SB05-0203
Battelle ID	E9608-FS
Sample Type	SA
Collection Date	11/01/2022
Extraction Date	11/09/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	76	E9608-FS(0)	12/6/2022
13C4-PFHpA	73	E9608-FS(0)	12/6/2022
13C8-PFOA	78	E9608-FS(0)	12/6/2022
13C9-PFNA	68	E9608-FS(0)	12/6/2022
13C6-PFDA	83	E9608-FS(0)	12/6/2022
13C7-PFUnA	75	E9608-FS(0)	12/6/2022
13C2-PFDoA	62	E9608-FS(0)	12/6/2022
13C2-PFTeDA	46 N	E9608-FS(0)	12/6/2022
d3-MeFOSAA	72	E9608-FS(0)	12/6/2022
d5-EtFOSAA	55	E9608-FS(0)	12/6/2022
13C3-PFBS	69	E9608-FS(0)	12/6/2022
13C3-PFHxS	75	E9608-FS(0)	12/6/2022
13C8-PFOS	69	E9608-FS(0)	12/6/2022
13C3-HFPO-DA	74	E9608-FS(0)	12/6/2022

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Analyzed by: Harnden, Kelsey
Printed: 1/27/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK OU2A5-SB05-1011
Battelle ID	E9609-FS
Sample Type	SA
Collection Date	11/01/2022
Extraction Date	11/09/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	7.77
Matrix	SO
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	E9609-FS(0)	1.000	12/6/2022	0.178	0.500	1.00
PFHpA	**375-85-9**	**0.500 U**	**E9609-FS(0)**	**1.000**	**12/6/2022**	**0.168**	**0.500**	**1.00**
PFOA	335-67-1	0.500 U	E9609-FS(0)	1.000	12/6/2022	0.214	0.500	1.00
PFNA	**375-95-1**	**0.500 U**	**E9609-FS(0)**	**1.000**	**12/6/2022**	**0.157**	**0.500**	**1.00**
PFDA	335-76-2	0.500 U	E9609-FS(0)	1.000	12/6/2022	0.158	0.500	1.00
PFUnA	**2058-94-8**	**0.500 U**	**E9609-FS(0)**	**1.000**	**12/6/2022**	**0.156**	**0.500**	**1.00**
PFDoA	307-55-1	0.500 U	E9609-FS(0)	1.000	12/6/2022	0.160	0.500	1.00
PFTrDA	**72629-94-8**	**0.500 U**	**E9609-FS(0)**	**1.000**	**12/6/2022**	**0.161**	**0.500**	**1.00**
PFTeDA	376-06-7	0.500 U	E9609-FS(0)	1.000	12/6/2022	0.162	0.500	2.00
NMeFOSAA	**2355-31-9**	**0.500 U**	**E9609-FS(0)**	**1.000**	**12/6/2022**	**0.159**	**0.500**	**2.00**
NEtFOSAA	2991-50-6	0.500 U	E9609-FS(0)	1.000	12/6/2022	0.165	0.500	2.00
PFBS	**375-73-5**	**0.500 U**	**E9609-FS(0)**	**1.000**	**12/6/2022**	**0.171**	**0.500**	**1.00**
PFHxS	355-46-4	0.500 U	E9609-FS(0)	1.000	12/6/2022	0.173	0.500	1.00
PFOS	**1763-23-1**	**0.500 U**	**E9609-FS(0)**	**1.000**	**12/6/2022**	**0.175**	**0.500**	**1.00**
HFPO-DA	13252-13-6	0.500 U	E9609-FS(0)	1.000	12/6/2022	0.159	0.500	2.00
Adona	**919005-14-4**	**0.500 U**	**E9609-FS(0)**	**1.000**	**12/6/2022**	**0.160**	**0.500**	**2.00**
9Cl-PF3ONS	756426-58-1	0.500 U	E9609-FS(0)	1.000	12/6/2022	0.154	0.500	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.500 U**	**E9609-FS(0)**	**1.000**	**12/6/2022**	**0.150**	**0.500**	**2.00**

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A5-SB04-0203
Battelle ID	E9610-FS
Sample Type	SA
Collection Date	11/01/2022
Extraction Date	11/09/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	8.58
Matrix	SO
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	0.499 U	E9610-FS(0)	1.000	12/6/2022	0.178	0.499	0.998	
PFHpA	**375-85-9**	**0.499 U**	**E9610-FS(0)**	**1.000**	**12/6/2022**	**0.168**	**0.499**	**0.998**	
PFOA	335-67-1	0.499 U	E9610-FS(0)	1.000	12/6/2022	0.214	0.499	0.998	
PFNA	**375-95-1**	**0.499 U**	**E9610-FS(0)**	**1.000**	**12/6/2022**	**0.157**	**0.499**	**0.998**	
PFDA	335-76-2	0.499 U	E9610-FS(0)	1.000	12/6/2022	0.158	0.499	0.998	
PFUnA	**2058-94-8**	**0.499 U**	**E9610-FS(0)**	**1.000**	**12/6/2022**	**0.156**	**0.499**	**0.998**	
PFDoA	307-55-1	0.499 UJ	E9610-FS(0)	1.000	12/6/2022	0.160	0.499	0.998	SSL
PFTrDA	**72629-94-8**	**0.499 UJ**	**E9610-FS(0)**	**1.000**	**12/6/2022**	**0.161**	**0.499**	**0.998**	SSL
PFTeDA	376-06-7	0.499 UJ	E9610-FS(0)	1.000	12/6/2022	0.162	0.499	2.00	SSL
NMeFOSAA	**2355-31-9**	**0.499 UJ**	**E9610-FS(0)**	**1.000**	**12/6/2022**	**0.159**	**0.499**	**2.00**	
NEtFOSAA	2991-50-6	0.499 UJ	E9610-FS(0)	1.000	12/6/2022	0.165	0.499	2.00	
PFBS	**375-73-5**	**0.499 U**	**E9610-FS(0)**	**1.000**	**12/6/2022**	**0.171**	**0.499**	**0.998**	
PFHxS	355-46-4	0.499 U	E9610-FS(0)	1.000	12/6/2022	0.173	0.499	0.998	
PFOS	**1763-23-1**	**0.499 U**	**E9610-FS(0)**	**1.000**	**12/6/2022**	**0.175**	**0.499**	**0.998**	
HFPO-DA	13252-13-6	0.499 U	E9610-FS(0)	1.000	12/6/2022	0.159	0.499	2.00	
Adona	**919005-14-4**	**0.499 U**	**E9610-FS(0)**	**1.000**	**12/6/2022**	**0.160**	**0.499**	**2.00**	
9Cl-PF3ONS	756426-58-1	0.499 U	E9610-FS(0)	1.000	12/6/2022	0.154	0.499	2.00	
11Cl-PF3OUdS	**763051-92-9**	**0.499 U**	**E9610-FS(0)**	**1.000**	**12/6/2022**	**0.150**	**0.499**	**2.00**	

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A5-SB04-0203
Battelle ID	E9610-FS
Sample Type	SA
Collection Date	11/01/2022
Extraction Date	11/09/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	77	E9610-FS(0)	12/6/2022
13C4-PFHpA	**72**	**E9610-FS(0)**	**12/6/2022**
13C8-PFOA	75	E9610-FS(0)	12/6/2022
13C9-PFNA	**69**	**E9610-FS(0)**	**12/6/2022**
13C6-PFDA	70	E9610-FS(0)	12/6/2022
13C7-PFUnA	**56**	**E9610-FS(0)**	**12/6/2022**
13C2-PFDoA	36 N	E9610-FS(0)	12/6/2022
13C2-PFTeDA	**42 N**	**E9610-FS(0)**	**12/6/2022**
d3-MeFOSAA	42 N	E9610-FS(0)	12/6/2022
d5-EtFOSAA	**33 N**	**E9610-FS(0)**	**12/6/2022**
13C3-PFBS	65	E9610-FS(0)	12/6/2022
13C3-PFHxS	**70**	**E9610-FS(0)**	**12/6/2022**
13C8-PFOS	61	E9610-FS(0)	12/6/2022
13C3-HFPO-DA	**74**	**E9610-FS(0)**	**12/6/2022**

MW 3/6/23
Analyzed by: Harnden, Kelsey
Printed: 1/27/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A5-SB04-0506
Battelle ID	E9611-FS
Sample Type	SA
Collection Date	11/01/2022
Extraction Date	11/09/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	12.48
Matrix	SO
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.178	0.500	1.00
PFHpA	375-85-9	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.168	0.500	1.00
PFOA	335-67-1	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.214	0.500	1.00
PFNA	375-95-1	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.157	0.500	1.00
PFDA	335-76-2	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.156	0.500	1.00
PFDoA	307-55-1	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.165	0.500	2.00
PFBS	375-73-5	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.171	0.500	1.00
PFHxS	355-46-4	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.173	0.500	1.00
PFOS	1763-23-1	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.159	0.500	2.00
Adona	919005-14-4	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 UT	E9611-FS(0)	1.000	12/7/2022	0.150	0.500	2.00

MW 3/6/23
Analyzed by: Harnden, Kelsey

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-CF1-SS02-0H01
Battelle ID	E9612-FS
Sample Type	SA
Collection Date	11/01/2022
Extraction Date	11/09/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	15.94
Matrix	SO
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.333 JT	E9612-FS(0)	1.000	12/7/2022	0.178	0.500	1.00
PFHpA	**375-85-9**	**0.500 UT**	**E9612-FS(0)**	**1.000**	**12/7/2022**	**0.168**	**0.500**	**1.00**
PFOA	335-67-1	0.705 JT	E9612-FS(0)	1.000	12/7/2022	0.214	0.500	1.00
PFNA	**375-95-1**	**0.256 JT**	**E9612-FS(0)**	**1.000**	**12/7/2022**	**0.157**	**0.500**	**1.00**
PFDA	335-76-2	3.20 T	E9612-FS(0)	1.000	12/7/2022	0.158	0.500	1.00
PFUnA	**2058-94-8**	**0.415 JT**	**E9612-FS(0)**	**1.000**	**12/7/2022**	**0.156**	**0.500**	**1.00**
PFDoA	307-55-1	1.23 T	E9612-FS(0)	1.000	12/7/2022	0.160	0.500	1.00
PFTrDA	**72629-94-8**	**0.500 UT**	**E9612-FS(0)**	**1.000**	**12/7/2022**	**0.161**	**0.500**	**1.00**
PFTeDA	376-06-7	0.495 JT	E9612-FS(0)	1.000	12/7/2022	0.162	0.500	2.00
NMeFOSAA	**2355-31-9**	**0.678 JT**	**E9612-FS(0)**	**1.000**	**12/7/2022**	**0.159**	**0.500**	**2.00**
NEtFOSAA	2991-50-6	0.500 UT	E9612-FS(0)	1.000	12/7/2022	0.165	0.500	2.00
PFBS	**375-73-5**	**0.500 UT**	**E9612-FS(0)**	**1.000**	**12/7/2022**	**0.171**	**0.500**	**1.00**
PFHxS	355-46-4	0.500 UT	E9612-FS(0)	1.000	12/7/2022	0.173	0.500	1.00
PFOS	**1763-23-1**	**8.93 T**	**E9612-FS(0)**	**1.000**	**12/7/2022**	**0.175**	**0.500**	**1.00**
HFPO-DA	13252-13-6	0.500 UT	E9612-FS(0)	1.000	12/7/2022	0.159	0.500	2.00
Adona	**919005-14-4**	**0.500 UT**	**E9612-FS(0)**	**1.000**	**12/7/2022**	**0.160**	**0.500**	**2.00**
9Cl-PF3ONS	756426-58-1	0.500 UT	E9612-FS(0)	1.000	12/7/2022	0.154	0.500	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.500 UT**	**E9612-FS(0)**	**1.000**	**12/7/2022**	**0.150**	**0.500**	**2.00**

MW 3/6/23

Analyzed by: Harnden, Kelsey
Printed: 1/27/2023

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-2030
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-OU2A2-EB01-110722-SO	E9772-FS	Water
2	NBKK-OU2A2-FB01-110822-SO	E9774-FS	Water

A Stage 2B/4 data validation was performed on the analytical data for one aqueous equipment blank sample and one aqueous field blank sample collected on November 7-8, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times

- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-OU2A2-EB01-110722-SO	None - ND	-	-	-
NBKK-OU2A2-FB01-110822-SO	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-EB01-110722-SO
Battelle ID	E9772-FS
Sample Type	SA
Collection Date	11/07/2022
Extraction Date	11/17/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.274
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.833	2.28	4.56
PFHpA	375-85-9	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.859	2.28	4.56
PFOA	335-67-1	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.922	2.28	4.56
PFNA	375-95-1	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.760	2.28	4.56
PFDA	335-76-2	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.715	2.28	4.56
PFUnA	2058-94-8	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.686	2.28	4.56
PFDoA	307-55-1	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.693	2.28	4.56
PFTrDA	72629-94-8	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.677	2.28	4.56
PFTeDA	376-06-7	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.722	2.28	4.56
NMeFOSAA	2355-31-9	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.940	2.28	4.56
NEtFOSAA	2991-50-6	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.903	2.28	4.56
PFBS	375-73-5	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.790	2.28	4.56
PFHxS	355-46-4	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.910	2.28	4.56
PFOS	1763-23-1	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.976	2.28	4.56
HFPO-DA	13252-13-6	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.789	2.28	4.56
Adona	919005-14-4	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.793	2.28	4.56
9Cl-PF3ONS	756426-58-1	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.940	2.28	4.56
11Cl-PF3OUdS	763051-92-9	2.28 U	E9772-FS(0)	1.000	12/13/2022	0.822	2.28	4.56

NW316123

BATTELLE
It can be done

2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-FB01-110822-SO
Battelle ID	E9774-FS
Sample Type	SA
Collection Date	11/08/2022
Extraction Date	11/17/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.242
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.58 U	E9774-FS(0)	1.000	12/13/2022	0.943	2.58	5.17
PFHpA	375-85-9	2.58 U	E9774-FS(0)	1.000	12/13/2022	0.972	2.58	5.17
PFOA	335-67-1	2.58 U	E9774-FS(0)	1.000	12/13/2022	1.04	2.58	5.17
PFNA	375-95-1	2.58 U	E9774-FS(0)	1.000	12/13/2022	0.861	2.58	5.17
PFDA	335-76-2	2.58 U	E9774-FS(0)	1.000	12/13/2022	0.810	2.58	5.17
PFUnA	2058-94-8	2.58 U	E9774-FS(0)	1.000	12/13/2022	0.777	2.58	5.17
PFDoA	307-55-1	2.58 U	E9774-FS(0)	1.000	12/13/2022	0.785	2.58	5.17
PFTrDA	72629-94-8	2.58 U	E9774-FS(0)	1.000	12/13/2022	0.767	2.58	5.17
PFTeDA	376-06-7	2.58 U	E9774-FS(0)	1.000	12/13/2022	0.817	2.58	5.17
NMeFOSAA	2355-31-9	2.58 U	E9774-FS(0)	1.000	12/13/2022	1.06	2.58	5.17
NEtFOSAA	2991-50-6	2.58 U	E9774-FS(0)	1.000	12/13/2022	1.02	2.58	5.17
PFBS	375-73-5	2.58 U	E9774-FS(0)	1.000	12/13/2022	0.895	2.58	5.17
PFHxS	355-46-4	2.58 U	E9774-FS(0)	1.000	12/13/2022	1.03	2.58	5.17
PFOS	1763-23-1	2.58 U	E9774-FS(0)	1.000	12/13/2022	1.11	2.58	5.17
HFPO-DA	13252-13-6	2.58 U	E9774-FS(0)	1.000	12/13/2022	0.894	2.58	5.17
Adona	919005-14-4	2.58 U	E9774-FS(0)	1.000	12/13/2022	0.898	2.58	5.17
9Cl-PF3ONS	756426-58-1	2.58 U	E9774-FS(0)	1.000	12/13/2022	1.06	2.58	5.17
11Cl-PF3OUdS	763051-92-9	2.58 U	E9774-FS(0)	1.000	12/13/2022	0.931	2.58	5.17

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-2031
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-CF1-SB02-3839	E9763-FS	Soil
2	NBKK-B1006-SS04-0H01	E9764-FS	Soil
3	NBKK-B1006-SS04P-0H01	E9765-FS	Soil
4	NBKK-OU2A2-SS02-0H01	E9766-FS	Soil
5	NBKK-OU2A2-SB03-0203	E9767-FS	Soil
5MS	NBKK-OU2A2-SB03-0203MS	E9768-FSMS	Soil
5MSD	NBKK-OU2A2-SB03-0203MSD	E9769-FSMSD	Soil
6	NBKK-OU2A2-SS01-0H01	E9770-FS	Soil
7	NBKK-OU2A2-SB04-0203	E9771-FS	Soil
8	NBKK-OU2A2-SB05-0102	E9773-FS	Soil
9	NBKK-OU2A2-SS06-0H01	E9775-FS	Soil
10	NBKK-OU2A2-SB06-0304	E9776-FS	Soil
11	NBKK-OU2A2-SB05-0607	E9777-FS	Soil

A Stage 2B/4 data validation was performed on the analytical data for eleven soil samples collected on November 2-8, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5 369 09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;

- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- The compound PFHxS was reanalyzed outside holding time and was flagged (T) by the laboratory. However, the extracts were stored per draft method EPA Method 1633 which allows for a 90-day holding time. The (T) flags were removed.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-OU2A2-EB01-110722-SO	None - ND	-	-	-
NBKK-OU2A2-FB01-110822-SO	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

Sample ID	Compound	MS %R/MSD %R/RPD	Qualifier
5	PFDoA	OK/149%/OK	None - Sample ND
	NEtFOSAA	142%/143%/OK	

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	NBKK-B1006-SS04-0H01 ng/g	NBKK-B1006-SS04P-0H01 ng/g	RPD	Qualifier
PFHxA	0.266	0.280	5%	None
PFHpA	0.186	0.238	25%	
PFOA	0.280	0.251	11%	
PFNA	0.203	0.289	35%	
PFHxS	0.187	0.196	5%	
PFOS	2.21	3.27	39%	None - <5X LOQ

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-CF1-SB02-3839
Battelle ID	E9763-FS
Sample Type	SA
Collection Date	11/02/2022
Extraction Date	11/15/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	7.88
Matrix	SO
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E9763-FS(0)	1.000	12/10/2022	0.178	0.499	0.998
PFHpA	**375-85-9**	**0.499 U**	**E9763-FS(0)**	**1.000**	**12/10/2022**	**0.168**	**0.499**	**0.998**
PFOA	335-67-1	0.499 U	E9763-FS(0)	1.000	12/10/2022	0.214	0.499	0.998
PFNA	**375-95-1**	**0.499 U**	**E9763-FS(0)**	**1.000**	**12/10/2022**	**0.157**	**0.499**	**0.998**
PFDA	335-76-2	0.499 U	E9763-FS(0)	1.000	12/10/2022	0.158	0.499	0.998
PFUnA	**2058-94-8**	**0.499 U**	**E9763-FS(0)**	**1.000**	**12/10/2022**	**0.156**	**0.499**	**0.998**
PFDoA	307-55-1	0.499 U	E9763-FS(0)	1.000	12/10/2022	0.160	0.499	0.998
PFTrDA	**72629-94-8**	**0.499 U**	**E9763-FS(0)**	**1.000**	**12/10/2022**	**0.161**	**0.499**	**0.998**
PFTeDA	376-06-7	0.499 U	E9763-FS(0)	1.000	12/10/2022	0.162	0.499	2.00
NMeFOSAA	**2355-31-9**	**0.499 U**	**E9763-FS(0)**	**1.000**	**12/10/2022**	**0.159**	**0.499**	**2.00**
NEtFOSAA	2991-50-6	0.499 U	E9763-FS(0)	1.000	12/10/2022	0.165	0.499	2.00
PFBS	**375-73-5**	**0.499 U**	**E9763-FS(0)**	**1.000**	**12/10/2022**	**0.171**	**0.499**	**0.998**
PFHxS	355-46-4	0.499 U	E9763-FS(0)	1.000	2/5/2023	0.173	0.499	0.998
PFOS	**1763-23-1**	**0.499 U**	**E9763-FS(0)**	**1.000**	**12/10/2022**	**0.175**	**0.499**	**0.998**
HFPO-DA	13252-13-6	0.499 U	E9763-FS(0)	1.000	12/10/2022	0.159	0.499	2.00
Adona	**919005-14-4**	**0.499 U**	**E9763-FS(0)**	**1.000**	**12/10/2022**	**0.160**	**0.499**	**2.00**
9Cl-PF3ONS	756426-58-1	0.499 U	E9763-FS(0)	1.000	12/10/2022	0.154	0.499	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.499 U**	**E9763-FS(0)**	**1.000**	**12/10/2022**	**0.150**	**0.499**	**2.00**

NW 3/6/23

Analyzed by: Harnden, Kelsey
Printed: 2/7/2023

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2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B1006-SS04-0H01
Battelle ID	E9764-FS
Sample Type	SA
Collection Date	11/03/2022
Extraction Date	11/15/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	12.76
Matrix	SO
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.266 J	E9764-FS(0)	1.000	12/10/2022	0.178	0.500	1.00
PFHpA	375-85-9	0.186 J	E9764-FS(0)	1.000	12/10/2022	0.168	0.500	1.00
PFOA	335-67-1	0.280 J	E9764-FS(0)	1.000	12/10/2022	0.214	0.500	1.00
PFNA	375-95-1	0.203 J	E9764-FS(0)	1.000	12/10/2022	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	E9764-FS(0)	1.000	12/10/2022	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	E9764-FS(0)	1.000	12/10/2022	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	E9764-FS(0)	1.000	12/10/2022	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	E9764-FS(0)	1.000	12/10/2022	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	E9764-FS(0)	1.000	12/10/2022	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	E9764-FS(0)	1.000	12/10/2022	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	E9764-FS(0)	1.000	12/10/2022	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	E9764-FS(0)	1.000	12/10/2022	0.171	0.500	1.00
PFHxS	355-46-4	0.187 J	E9764-FS(0)	1.000	2/5/2023	0.173	0.500	1.00
PFOS	1763-23-1	2.21	E9764-FS(0)	1.000	12/10/2022	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	E9764-FS(0)	1.000	12/10/2022	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	E9764-FS(0)	1.000	12/10/2022	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	E9764-FS(0)	1.000	12/10/2022	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	E9764-FS(0)	1.000	12/10/2022	0.150	0.500	2.00

NW 3/6/23

Analyzed by: Harnden, Kelsey
Printed: 2/7/2023

BATTELLE
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3

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B1006-SS04P-0H01
Battelle ID	E9765-FS
Sample Type	SA
Collection Date	11/03/2022
Extraction Date	11/15/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	13.50
Matrix	SO
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.280 J	E9765-FS(0)	1.000	12/10/2022	0.178	0.500	1.00
PFHpA	**375-85-9**	**0.238 J**	**E9765-FS(0)**	**1.000**	**12/10/2022**	**0.168**	**0.500**	**1.00**
PFOA	335-67-1	0.251 J	E9765-FS(0)	1.000	12/10/2022	0.214	0.500	1.00
PFNA	**375-95-1**	**0.289 J**	**E9765-FS(0)**	**1.000**	**12/10/2022**	**0.157**	**0.500**	**1.00**
PFDA	335-76-2	0.500 U	E9765-FS(0)	1.000	12/10/2022	0.158	0.500	1.00
PFUnA	**2058-94-8**	**0.500 U**	**E9765-FS(0)**	**1.000**	**12/10/2022**	**0.156**	**0.500**	**1.00**
PFDoA	307-55-1	0.500 U	E9765-FS(0)	1.000	12/10/2022	0.160	0.500	1.00
PFTrDA	**72629-94-8**	**0.500 U**	**E9765-FS(0)**	**1.000**	**12/10/2022**	**0.161**	**0.500**	**1.00**
PFTeDA	376-06-7	0.500 U	E9765-FS(0)	1.000	12/10/2022	0.162	0.500	2.00
NMeFOSAA	**2355-31-9**	**0.500 U**	**E9765-FS(0)**	**1.000**	**12/10/2022**	**0.159**	**0.500**	**2.00**
NEtFOSAA	2991-50-6	0.500 U	E9765-FS(0)	1.000	12/10/2022	0.165	0.500	2.00
PFBS	**375-73-5**	**0.500 U**	**E9765-FS(0)**	**1.000**	**12/10/2022**	**0.171**	**0.500**	**1.00**
PFHxS	355-46-4	0.196 J	E9765-FS(0)	1.000	2/5/2023	0.173	0.500	1.00
PFOS	**1763-23-1**	**3.27**	**E9765-FS(0)**	**1.000**	**12/10/2022**	**0.175**	**0.500**	**1.00**
HFPO-DA	13252-13-6	0.500 U	E9765-FS(0)	1.000	12/10/2022	0.159	0.500	2.00
Adona	**919005-14-4**	**0.500 U**	**E9765-FS(0)**	**1.000**	**12/10/2022**	**0.160**	**0.500**	**2.00**
9Cl-PF3ONS	756426-58-1	0.500 U	E9765-FS(0)	1.000	12/10/2022	0.154	0.500	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.500 U**	**E9765-FS(0)**	**1.000**	**12/10/2022**	**0.150**	**0.500**	**2.00**

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-SS02-0H01
Battelle ID	E9766-FS
Sample Type	SA
Collection Date	11/04/2022
Extraction Date	11/15/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	24.54
Matrix	SO
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	E9766-FS(0)	1.000	12/10/2022	0.178	0.500	1.00
PFHpA	**375-85-9**	**0.500 U**	**E9766-FS(0)**	**1.000**	**12/10/2022**	**0.168**	**0.500**	**1.00**
PFOA	335-67-1	0.500 U	E9766-FS(0)	1.000	12/10/2022	0.214	0.500	1.00
PFNA	**375-95-1**	**0.500 U**	**E9766-FS(0)**	**1.000**	**12/10/2022**	**0.157**	**0.500**	**1.00**
PFDA	335-76-2	0.500 U	E9766-FS(0)	1.000	12/10/2022	0.158	0.500	1.00
PFUnA	**2058-94-8**	**0.500 U**	**E9766-FS(0)**	**1.000**	**12/10/2022**	**0.156**	**0.500**	**1.00**
PFDoA	307-55-1	0.500 U	E9766-FS(0)	1.000	12/10/2022	0.160	0.500	1.00
PFTrDA	**72629-94-8**	**0.500 U**	**E9766-FS(0)**	**1.000**	**12/10/2022**	**0.161**	**0.500**	**1.00**
PFTeDA	376-06-7	0.500 U	E9766-FS(0)	1.000	12/10/2022	0.162	0.500	2.00
NMeFOSAA	**2355-31-9**	**0.500 U**	**E9766-FS(0)**	**1.000**	**12/10/2022**	**0.159**	**0.500**	**2.00**
NEtFOSAA	2991-50-6	0.500 U	E9766-FS(0)	1.000	12/10/2022	0.165	0.500	2.00
PFBS	**375-73-5**	**0.500 U**	**E9766-FS(0)**	**1.000**	**12/10/2022**	**0.171**	**0.500**	**1.00**
PFHxS	355-46-4	0.500 U	E9766-FS(0)	1.000	2/5/2023	0.173	0.500	1.00
PFOS	**1763-23-1**	**0.500 U**	**E9766-FS(0)**	**1.000**	**12/10/2022**	**0.175**	**0.500**	**1.00**
HFPO-DA	13252-13-6	0.500 U	E9766-FS(0)	1.000	12/10/2022	0.159	0.500	2.00
Adona	**919005-14-4**	**0.500 U**	**E9766-FS(0)**	**1.000**	**12/10/2022**	**0.160**	**0.500**	**2.00**
9Cl-PF3ONS	756426-58-1	0.500 U	E9766-FS(0)	1.000	12/10/2022	0.154	0.500	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.500 U**	**E9766-FS(0)**	**1.000**	**12/10/2022**	**0.150**	**0.500**	**2.00**

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-SB03-0203
Battelle ID	E9767-FS
Sample Type	SA
Collection Date	11/04/2022
Extraction Date	11/15/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	25.63
Matrix	SO
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E9767-FS(0)	1.000	12/10/2022	0.178	0.499	0.998
PFHpA	**375-85-9**	**0.499 U**	**E9767-FS(0)**	**1.000**	**12/10/2022**	**0.168**	**0.499**	**0.998**
PFOA	335-67-1	0.499 U	E9767-FS(0)	1.000	12/10/2022	0.214	0.499	0.998
PFNA	**375-95-1**	**0.499 U**	**E9767-FS(0)**	**1.000**	**12/10/2022**	**0.157**	**0.499**	**0.998**
PFDA	335-76-2	0.499 U	E9767-FS(0)	1.000	12/10/2022	0.158	0.499	0.998
PFUnA	**2058-94-8**	**0.499 U**	**E9767-FS(0)**	**1.000**	**12/10/2022**	**0.156**	**0.499**	**0.998**
PFDoA	307-55-1	0.499 U	E9767-FS(0)	1.000	12/10/2022	0.160	0.499	0.998
PFTrDA	**72629-94-8**	**0.499 U**	**E9767-FS(0)**	**1.000**	**12/10/2022**	**0.161**	**0.499**	**0.998**
PFTeDA	376-06-7	0.499 U	E9767-FS(0)	1.000	12/10/2022	0.162	0.499	2.00
NMeFOSAA	**2355-31-9**	**0.499 U**	**E9767-FS(0)**	**1.000**	**12/10/2022**	**0.159**	**0.499**	**2.00**
NEtFOSAA	2991-50-6	0.499 U	E9767-FS(0)	1.000	12/10/2022	0.165	0.499	2.00
PFBS	**375-73-5**	**0.499 U**	**E9767-FS(0)**	**1.000**	**12/10/2022**	**0.171**	**0.499**	**0.998**
PFHxS	355-46-4	0.499 U	E9767-FS(0)	1.000	2/5/2023	0.173	0.499	0.998
PFOS	**1763-23-1**	**0.499 U**	**E9767-FS(0)**	**1.000**	**12/10/2022**	**0.175**	**0.499**	**0.998**
HFPO-DA	13252-13-6	0.499 U	E9767-FS(0)	1.000	12/10/2022	0.159	0.499	2.00
Adona	**919005-14-4**	**0.499 U**	**E9767-FS(0)**	**1.000**	**12/10/2022**	**0.160**	**0.499**	**2.00**
9Cl-PF3ONS	756426-58-1	0.499 U	E9767-FS(0)	1.000	12/10/2022	0.154	0.499	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.499 U**	**E9767-FS(0)**	**1.000**	**12/10/2022**	**0.150**	**0.499**	**2.00**

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-SS01-0H01
Battelle ID	E9770-FS
Sample Type	SA
Collection Date	11/05/2022
Extraction Date	11/15/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	8.49
Matrix	SO
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E9770-FS(0)	1.000	12/10/2022	0.178	0.499	0.998
PFHpA	**375-85-9**	**0.499 U**	**E9770-FS(0)**	**1.000**	**12/10/2022**	**0.168**	**0.499**	**0.998**
PFOA	335-67-1	0.499 U	E9770-FS(0)	1.000	12/10/2022	0.214	0.499	0.998
PFNA	**375-95-1**	**0.499 U**	**E9770-FS(0)**	**1.000**	**12/10/2022**	**0.157**	**0.499**	**0.998**
PFDA	335-76-2	0.499 U	E9770-FS(0)	1.000	12/10/2022	0.158	0.499	0.998
PFUnA	**2058-94-8**	**0.499 U**	**E9770-FS(0)**	**1.000**	**12/10/2022**	**0.156**	**0.499**	**0.998**
PFDoA	307-55-1	0.499 U	E9770-FS(0)	1.000	12/10/2022	0.160	0.499	0.998
PFTrDA	**72629-94-8**	**0.499 U**	**E9770-FS(0)**	**1.000**	**12/10/2022**	**0.161**	**0.499**	**0.998**
PFTeDA	376-06-7	0.499 U	E9770-FS(0)	1.000	12/10/2022	0.162	0.499	2.00
NMeFOSAA	**2355-31-9**	**0.499 U**	**E9770-FS(0)**	**1.000**	**12/10/2022**	**0.159**	**0.499**	**2.00**
NEtFOSAA	2991-50-6	0.499 U	E9770-FS(0)	1.000	12/10/2022	0.165	0.499	2.00
PFBS	**375-73-5**	**0.499 U**	**E9770-FS(0)**	**1.000**	**12/10/2022**	**0.171**	**0.499**	**0.998**
PFHxS	355-46-4	0.499 U	E9770-FS(0)	1.000	2/5/2023	0.173	0.499	0.998
PFOS	**1763-23-1**	**0.499 U**	**E9770-FS(0)**	**1.000**	**12/10/2022**	**0.175**	**0.499**	**0.998**
HFPO-DA	13252-13-6	0.499 U	E9770-FS(0)	1.000	12/10/2022	0.159	0.499	2.00
Adona	**919005-14-4**	**0.499 U**	**E9770-FS(0)**	**1.000**	**12/10/2022**	**0.160**	**0.499**	**2.00**
9Cl-PF3ONS	756426-58-1	0.499 U	E9770-FS(0)	1.000	12/10/2022	0.154	0.499	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.499 U**	**E9770-FS(0)**	**1.000**	**12/10/2022**	**0.150**	**0.499**	**2.00**

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-SB04-0203
Battelle ID	E9771-FS
Sample Type	SA
Collection Date	11/07/2022
Extraction Date	11/15/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	18.05
Matrix	SO
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	E9771-FS(0)	1.000	12/10/2022	0.178	0.500	1.00
PFHpA	**375-85-9**	**0.500 U**	**E9771-FS(0)**	**1.000**	**12/10/2022**	**0.168**	**0.500**	**1.00**
PFOA	335-67-1	0.500 U	E9771-FS(0)	1.000	12/10/2022	0.214	0.500	1.00
PFNA	**375-95-1**	**0.500 U**	**E9771-FS(0)**	**1.000**	**12/10/2022**	**0.157**	**0.500**	**1.00**
PFDA	335-76-2	0.500 U	E9771-FS(0)	1.000	12/10/2022	0.158	0.500	1.00
PFUnA	**2058-94-8**	**0.500 U**	**E9771-FS(0)**	**1.000**	**12/10/2022**	**0.156**	**0.500**	**1.00**
PFDoA	307-55-1	0.500 U	E9771-FS(0)	1.000	12/10/2022	0.160	0.500	1.00
PFTrDA	**72629-94-8**	**0.500 U**	**E9771-FS(0)**	**1.000**	**12/10/2022**	**0.161**	**0.500**	**1.00**
PFTeDA	376-06-7	0.500 U	E9771-FS(0)	1.000	12/10/2022	0.162	0.500	2.00
NMeFOSAA	**2355-31-9**	**0.500 U**	**E9771-FS(0)**	**1.000**	**12/10/2022**	**0.159**	**0.500**	**2.00**
NEtFOSAA	2991-50-6	0.500 U	E9771-FS(0)	1.000	12/10/2022	0.165	0.500	2.00
PFBS	**375-73-5**	**0.500 U**	**E9771-FS(0)**	**1.000**	**12/10/2022**	**0.171**	**0.500**	**1.00**
PFHxS	355-46-4	0.277 J	E9771-FS(0)	1.000	2/5/2023	0.173	0.500	1.00
PFOS	**1763-23-1**	**1.93**	**E9771-FS(0)**	**1.000**	**12/10/2022**	**0.175**	**0.500**	**1.00**
HFPO-DA	13252-13-6	0.500 U	E9771-FS(0)	1.000	12/10/2022	0.159	0.500	2.00
Adona	**919005-14-4**	**0.500 U**	**E9771-FS(0)**	**1.000**	**12/10/2022**	**0.160**	**0.500**	**2.00**
9Cl-PF3ONS	756426-58-1	0.500 U	E9771-FS(0)	1.000	12/10/2022	0.154	0.500	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.500 U**	**E9771-FS(0)**	**1.000**	**12/10/2022**	**0.150**	**0.500**	**2.00**

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-SB05-0102
Battelle ID	E9773-FS
Sample Type	SA
Collection Date	11/08/2022
Extraction Date	11/15/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	6.88
Matrix	SO
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	E9773-FS(0)	1.000	12/10/2022	0.178	0.499	0.998
PFHpA	**375-85-9**	**0.499 U**	**E9773-FS(0)**	**1.000**	**12/10/2022**	**0.168**	**0.499**	**0.998**
PFOA	335-67-1	0.499 U	E9773-FS(0)	1.000	12/10/2022	0.214	0.499	0.998
PFNA	**375-95-1**	**0.499 U**	**E9773-FS(0)**	**1.000**	**12/10/2022**	**0.157**	**0.499**	**0.998**
PFDA	335-76-2	0.499 U	E9773-FS(0)	1.000	12/10/2022	0.158	0.499	0.998
PFUnA	**2058-94-8**	**0.499 U**	**E9773-FS(0)**	**1.000**	**12/10/2022**	**0.156**	**0.499**	**0.998**
PFDoA	307-55-1	0.499 U	E9773-FS(0)	1.000	12/10/2022	0.160	0.499	0.998
PFTrDA	**72629-94-8**	**0.499 U**	**E9773-FS(0)**	**1.000**	**12/10/2022**	**0.161**	**0.499**	**0.998**
PFTeDA	376-06-7	0.499 U	E9773-FS(0)	1.000	12/10/2022	0.162	0.499	2.00
NMeFOSAA	**2355-31-9**	**0.499 U**	**E9773-FS(0)**	**1.000**	**12/10/2022**	**0.159**	**0.499**	**2.00**
NEtFOSAA	2991-50-6	0.499 U	E9773-FS(0)	1.000	12/10/2022	0.165	0.499	2.00
PFBS	**375-73-5**	**0.499 U**	**E9773-FS(0)**	**1.000**	**12/10/2022**	**0.171**	**0.499**	**0.998**
PFHxS	355-46-4	0.499 U	E9773-FS(0)	1.000	2/5/2023	0.173	0.499	0.998
PFOS	**1763-23-1**	**1.07**	**E9773-FS(0)**	**1.000**	**12/10/2022**	**0.175**	**0.499**	**0.998**
HFPO-DA	13252-13-6	0.499 U	E9773-FS(0)	1.000	12/10/2022	0.159	0.499	2.00
Adona	**919005-14-4**	**0.499 U**	**E9773-FS(0)**	**1.000**	**12/10/2022**	**0.160**	**0.499**	**2.00**
9Cl-PF3ONS	756426-58-1	0.499 U	E9773-FS(0)	1.000	12/10/2022	0.154	0.499	2.00
11Cl-PF3OUdS	**763051-92-9**	**0.499 U**	**E9773-FS(0)**	**1.000**	**12/10/2022**	**0.150**	**0.499**	**2.00**

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Analyzed by: Harnden, Kelsey
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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-SS06-0H01
Battelle ID	E9775-FS
Sample Type	SA
Collection Date	11/08/2022
Extraction Date	11/15/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	15.14
Matrix	SO
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.212 J	E9775-FS(0)	1.000	12/10/2022	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	E9775-FS(0)	1.000	12/10/2022	0.168	0.500	1.00
PFOA	335-67-1	0.808 J	E9775-FS(0)	1.000	12/10/2022	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	E9775-FS(0)	1.000	12/10/2022	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	E9775-FS(0)	1.000	12/10/2022	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	E9775-FS(0)	1.000	12/10/2022	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	E9775-FS(0)	1.000	12/10/2022	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	E9775-FS(0)	1.000	12/10/2022	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	E9775-FS(0)	1.000	12/10/2022	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	E9775-FS(0)	1.000	12/10/2022	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	E9775-FS(0)	1.000	12/10/2022	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	E9775-FS(0)	1.000	12/10/2022	0.171	0.500	1.00
PFHxS	355-46-4	1.34 J	E9775-FS(0)	1.000	2/5/2023	0.173	0.500	1.00
PFOS	1763-23-1	20.3	E9775-FS(0)	1.000	12/10/2022	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	E9775-FS(0)	1.000	12/10/2022	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	E9775-FS(0)	1.000	12/10/2022	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	E9775-FS(0)	1.000	12/10/2022	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	E9775-FS(0)	1.000	12/10/2022	0.150	0.500	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-SB06-0304
Battelle ID	E9776-FS
Sample Type	SA
Collection Date	11/08/2022
Extraction Date	11/15/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	18.80
Matrix	SO
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	E9776-FS(0)	1.000	12/10/2022	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	E9776-FS(0)	1.000	12/10/2022	0.168	0.500	1.00
PFOA	335-67-1	0.767 J	E9776-FS(0)	1.000	12/10/2022	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	E9776-FS(0)	1.000	12/10/2022	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	E9776-FS(0)	1.000	12/10/2022	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	E9776-FS(0)	1.000	12/10/2022	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	E9776-FS(0)	1.000	12/10/2022	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	E9776-FS(0)	1.000	12/10/2022	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	E9776-FS(0)	1.000	12/10/2022	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	E9776-FS(0)	1.000	12/10/2022	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	E9776-FS(0)	1.000	12/10/2022	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	E9776-FS(0)	1.000	12/10/2022	0.171	0.500	1.00
PFHxS	355-46-4	0.469 J	E9776-FS(0)	1.000	2/5/2023	0.173	0.500	1.00
PFOS	1763-23-1	4.03	E9776-FS(0)	1.000	12/10/2022	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	E9776-FS(0)	1.000	12/10/2022	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	E9776-FS(0)	1.000	12/10/2022	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	E9776-FS(0)	1.000	12/10/2022	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	E9776-FS(0)	1.000	12/10/2022	0.150	0.500	2.00

NW 3/6/23

Analyzed by: Harnden, Kelsey
Printed: 2/7/2023

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11

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK OU2A2-SB05-0607
Battelle ID	E9777-FS
Sample Type	SA
Collection Date	11/08/2022
Extraction Date	11/15/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	17.78
Matrix	SO
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	E9777-FS(0)	1.000	2/5/2023	0.173	0.500	1.00
PFOS	1763-23-1	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	E9777-FS(0)	1.000	12/10/2022	0.150	0.500	2.00

MW 3/6/23

Analyzed by: Harnden, Kelsey
Printed: 2/7/2023

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-2046
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-LFEX-MW03-1122	E9844-FS	Water
2	NBKK-B1006-MW02-1122	E9845-FS	Water
3	NBKK-LFEX-MW02-1122	E9846-FS	Water
4	NBKK-LFEX-MW04-1122	E9847-FS	Water
5	NBKK-LFEX-MW01-1122	E9848-FS	Water
6	NBKK-B1006-MW01-1122	E9849-FS	Water
7	NBKK-B1006-MW03-1122	E9850-FS	Water

A Stage 2B/4 data validation was performed on the analytical data for seven water samples collected on November 9-10, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC samples were not collected.

Surrogate Spike Recoveries

- Several samples exhibited low surrogate percent recoveries (%R) for several surrogate compounds. All associated compounds were qualified (J/UJ) in the samples. Please refer to the surrogate summaries on the Form Is for specific recoveries.

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R) except for the following.

LCS ID	Compound	%R	Qualifier	Affected Samples
LCS	PFUnA	142%	None	All Associated ND

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- EDS sample 7 exhibited PFHxS with a high ion ratio (>50%) that was flagged (Q) by the laboratory. This result was qualified as estimated (J).

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

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It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-MW03-1122
Battelle ID	E9844-FS
Sample Type	SA
Collection Date	11/10/2022
Extraction Date	11/22/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.268
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.852	2.33	4.66
PFHpA	375-85-9	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.878	2.33	4.66
PFOA	335-67-1	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.942	2.33	4.66
PFNA	375-95-1	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.777	2.33	4.66
PFDA	335-76-2	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.731	2.33	4.66
PFUnA	2058-94-8	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.701	2.33	4.66
PFDoA	307-55-1	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.709	2.33	4.66
PFTrDA	72629-94-8	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.692	2.33	4.66
PFTeDA	376-06-7	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.738	2.33	4.66
NMeFOSAA	2355-31-9	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.961	2.33	4.66
NEtFOSAA	2991-50-6	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.924	2.33	4.66
PFBS	375-73-5	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.808	2.33	4.66
PFHxS	355-46-4	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.930	2.33	4.66
PFOS	1763-23-1	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.998	2.33	4.66
HFPO-DA	13252-13-6	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.807	2.33	4.66
Adona	919005-14-4	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.811	2.33	4.66
9Cl-PF3ONS	756426-58-1	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.961	2.33	4.66
11Cl-PF3OUdS	763051-92-9	2.33 U	E9844-FS(0)	1.000	12/19/2022	0.840	2.33	4.66

BATTELLE
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2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B1006-MW02-1122
Battelle ID	E9845-FS
Sample Type	SA
Collection Date	11/09/2022
Extraction Date	11/22/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.287
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	211	E9845-FS(0)	1.000	12/19/2022	0.795	2.18	4.36
PFHpA	375-85-9	154	E9845-FS(0)	1.000	12/19/2022	0.820	2.18	4.36
PFOA	335-67-1	75.9	E9845-FS(0)	1.000	12/19/2022	0.880	2.18	4.36
PFNA	375-95-1	7.61	E9845-FS(0)	1.000	12/19/2022	0.726	2.18	4.36
PFDA	335-76-2	3.21 J	E9845-FS(0)	1.000	12/19/2022	0.683	2.18	4.36
PFUnA	2058-94-8	2.18 U	E9845-FS(0)	1.000	12/19/2022	0.655	2.18	4.36
PFDoA	307-55-1	2.18 U	E9845-FS(0)	1.000	12/19/2022	0.662	2.18	4.36
PFTrDA	72629-94-8	2.18 U	E9845-FS(0)	1.000	12/19/2022	0.646	2.18	4.36
PFTeDA	376-06-7	2.18 U	E9845-FS(0)	1.000	12/19/2022	0.689	2.18	4.36
NMeFOSAA	2355-31-9	2.18 U	E9845-FS(0)	1.000	12/19/2022	0.897	2.18	4.36
NEtFOSAA	2991-50-6	2.18 U	E9845-FS(0)	1.000	12/19/2022	0.862	2.18	4.36
PFBS	375-73-5	4.94	E9845-FS(0)	1.000	12/19/2022	0.754	2.18	4.36
PFHxS	355-46-4	66.3	E9845-FS(0)	1.000	12/19/2022	0.868	2.18	4.36
PFOS	1763-23-1	224	E9845-FS(0)	1.000	12/19/2022	0.932	2.18	4.36
HFPO-DA	13252-13-6	2.18 U	E9845-FS(0)	1.000	12/19/2022	0.753	2.18	4.36
Adona	919005-14-4	2.18 U	E9845-FS(0)	1.000	12/19/2022	0.757	2.18	4.36
9Cl-PF3ONS	756426-58-1	2.18 U	E9845-FS(0)	1.000	12/19/2022	0.897	2.18	4.36
11Cl-PF3OUdS	763051-92-9	2.18 U	E9845-FS(0)	1.000	12/19/2022	0.785	2.18	4.36

MW 1/19/23
Analyzed by: Boger, Warren
Printed: 1/3/2023

BATTELLE
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3

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-MW02-1122
Battelle ID	E9846-FS
Sample Type	SA
Collection Date	11/10/2022
Extraction Date	11/22/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.280
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	2.23 U	E9846-FS(0)	1.000	12/19/2022	0.815	2.23	4.46	
PFHpA	375-85-9	2.23 U	E9846-FS(0)	1.000	12/19/2022	0.840	2.23	4.46	
PFOA	335-67-1	2.23 U	E9846-FS(0)	1.000	12/19/2022	0.902	2.23	4.46	
PFNA	375-95-1	2.23 U	E9846-FS(0)	1.000	12/19/2022	0.744	2.23	4.46	
PFDA	335-76-2	2.23 U	E9846-FS(0)	1.000	12/19/2022	0.700	2.23	4.46	
PFUnA	2058-94-8	2.23 U	E9846-FS(0)	1.000	12/19/2022	0.671	2.23	4.46	
PFDoA	307-55-1	2.23 U	E9846-FS(0)	1.000	12/19/2022	0.679	2.23	4.46	
PFTrDA	72629-94-8	2.23 UJ	E9846-FS(0)	1.000	12/19/2022	0.663	2.23	4.46	SSL
PFTeDA	376-06-7	2.23 UJ	E9846-FS(0)	1.000	12/19/2022	0.706	2.23	4.46	SSL
NMeFOSAA	2355-31-9	2.23 U	E9846-FS(0)	1.000	12/19/2022	0.920	2.23	4.46	
NEtFOSAA	2991-50-6	2.23 U	E9846-FS(0)	1.000	12/19/2022	0.884	2.23	4.46	
PFBS	375-73-5	2.23 U	E9846-FS(0)	1.000	12/19/2022	0.773	2.23	4.46	
PFHxS	355-46-4	2.23 U	E9846-FS(0)	1.000	12/19/2022	0.890	2.23	4.46	
PFOS	1763-23-1	2.23 U	E9846-FS(0)	1.000	12/19/2022	0.955	2.23	4.46	
HFPO-DA	13252-13-6	2.23 U	E9846-FS(0)	1.000	12/19/2022	0.772	2.23	4.46	
Adona	919005-14-4	2.23 U	E9846-FS(0)	1.000	12/19/2022	0.776	2.23	4.46	
9Cl-PF3ONS	756426-58-1	2.23 U	E9846-FS(0)	1.000	12/19/2022	0.920	2.23	4.46	
11Cl-PF3OUdS	763051-92-9	2.23 U	E9846-FS(0)	1.000	12/19/2022	0.804	2.23	4.46	

MW 1/19/23

BATTELLE
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3

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-MW02-1122
Battelle ID	E9846-FS
Sample Type	SA
Collection Date	11/10/2022
Extraction Date	11/22/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	78	E9846-FS(0)	12/19/2022
13C4-PFHpA	**86**	**E9846-FS(0)**	**12/19/2022**
13C8-PFOA	93	E9846-FS(0)	12/19/2022
13C9-PFNA	**83**	**E9846-FS(0)**	**12/19/2022**
13C6-PFDA	85	E9846-FS(0)	12/19/2022
13C7-PFUnA	**64**	**E9846-FS(0)**	**12/19/2022**
13C2-PFDoA	57	E9846-FS(0)	12/19/2022
13C2-PFTeDA	**36** ✓	**E9846-FS(0)**	**12/19/2022**
d3-MeFOSAA	70	E9846-FS(0)	12/19/2022
d5-EtFOSAA	**65**	**E9846-FS(0)**	**12/19/2022**
13C3-PFBS	76	E9846-FS(0)	12/19/2022
13C3-PFHxS	**98**	**E9846-FS(0)**	**12/19/2022**
13C8-PFOS	75	E9846-FS(0)	12/19/2022
13C3-HFPO-DA	**76**	**E9846-FS(0)**	**12/19/2022**

NW 1/19/23
Analyzed by: Boger, Warren
Printed: 1/3/2023

BATTELLE
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4

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-MW04-1122
Battelle ID	E9847-FS
Sample Type	SA
Collection Date	11/10/2022
Extraction Date	11/22/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.259
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.881	2.41	4.83
PFHpA	375-85-9	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.908	2.41	4.83
PFOA	335-67-1	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.975	2.41	4.83
PFNA	375-95-1	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.804	2.41	4.83
PFDA	335-76-2	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.757	2.41	4.83
PFUnA	2058-94-8	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.726	2.41	4.83
PFDoA	307-55-1	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.734	2.41	4.83
PFTrDA	72629-94-8	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.716	2.41	4.83
PFTeDA	376-06-7	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.764	2.41	4.83
NMeFOSAA	2355-31-9	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.994	2.41	4.83
NEtFOSAA	2991-50-6	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.956	2.41	4.83
PFBS	375-73-5	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.836	2.41	4.83
PFHxS	355-46-4	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.962	2.41	4.83
PFOS	1763-23-1	2.41 U	E9847-FS(0)	1.000	12/19/2022	1.03	2.41	4.83
HFPO-DA	13252-13-6	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.835	2.41	4.83
Adona	919005-14-4	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.839	2.41	4.83
9Cl-PF3ONS	756426-58-1	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.994	2.41	4.83
11Cl-PF3OUdS	763051-92-9	2.41 U	E9847-FS(0)	1.000	12/19/2022	0.870	2.41	4.83

BATTELLE
It can be done

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-MW01-1122
Battelle ID	E9848-FS
Sample Type	SA
Collection Date	11/10/2022
Extraction Date	11/22/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.259
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	2.41 U	E9848-FS(0)	1.000	12/19/2022	0.881	2.41	4.83	
PFHpA	375-85-9	2.41 U	E9848-FS(0)	1.000	12/19/2022	0.908	2.41	4.83	
PFOA	335-67-1	2.41 U	E9848-FS(0)	1.000	12/19/2022	0.975	2.41	4.83	
PFNA	375-95-1	2.41 U	E9848-FS(0)	1.000	12/19/2022	0.804	2.41	4.83	
PFDA	335-76-2	2.41 U	E9848-FS(0)	1.000	12/19/2022	0.757	2.41	4.83	
PFUnA	2058-94-8	2.41 U	E9848-FS(0)	1.000	12/19/2022	0.726	2.41	4.83	
PFDoA	307-55-1	2.41 U	E9848-FS(0)	1.000	12/19/2022	0.734	2.41	4.83	
PFTrDA	72629-94-8	2.41 UJ	E9848-FS(0)	1.000	12/19/2022	0.716	2.41	4.83	SSL
PFTeDA	376-06-7	2.41 UJ	E9848-FS(0)	1.000	12/19/2022	0.764	2.41	4.83	SSL
NMeFOSAA	2355-31-9	2.41 U	E9848-FS(0)	1.000	12/19/2022	0.994	2.41	4.83	
NEtFOSAA	2991-50-6	2.41 U	E9848-FS(0)	1.000	12/19/2022	0.956	2.41	4.83	
PFBS	375-73-5	2.41 U	E9848-FS(0)	1.000	12/19/2022	0.836	2.41	4.83	
PFHxS	355-46-4	2.41 U	E9848-FS(0)	1.000	12/19/2022	0.962	2.41	4.83	
PFOS	1763-23-1	2.41 U	E9848-FS(0)	1.000	12/19/2022	1.03	2.41	4.83	
HFPO-DA	13252-13-6	2.41 U	E9848-FS(0)	1.000	12/19/2022	0.835	2.41	4.83	
Adona	919005-14-4	2.41 U	E9848-FS(0)	1.000	12/19/2022	0.839	2.41	4.83	
9Cl-PF3ONS	756426-58-1	2.41 U	E9848-FS(0)	1.000	12/19/2022	0.994	2.41	4.83	
11Cl-PF3OUdS	763051-92-9	2.41 U	E9848-FS(0)	1.000	12/19/2022	0.870	2.41	4.83	

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It can be done

5

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-LFEX-MW01-1122
Battelle ID	E9848-FS
Sample Type	SA
Collection Date	11/10/2022
Extraction Date	11/22/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	89	E9848-FS(0)	12/19/2022
13C4-PFHpA	**84**	**E9848-FS(0)**	**12/19/2022**
13C8-PFOA	90	E9848-FS(0)	12/19/2022
13C9-PFNA	**87**	**E9848-FS(0)**	**12/19/2022**
13C6-PFDA	83	E9848-FS(0)	12/19/2022
13C7-PFUnA	**68**	**E9848-FS(0)**	**12/19/2022**
13C2-PFDoA	60	E9848-FS(0)	12/19/2022
13C2-PFTeDA	**47** ✓	**E9848-FS(0)**	**12/19/2022**
d3-MeFOSAA	74	E9848-FS(0)	12/19/2022
d5-EtFOSAA	**71**	**E9848-FS(0)**	**12/19/2022**
13C3-PFBS	99	E9848-FS(0)	12/19/2022
13C3-PFHxS	**90**	**E9848-FS(0)**	**12/19/2022**
13C8-PFOS	79	E9848-FS(0)	12/19/2022
13C3-HFPO-DA	**96**	**E9848-FS(0)**	**12/19/2022**

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B1006-MW01-1122
Battelle ID	E9849-FS
Sample Type	SA
Collection Date	11/09/2022
Extraction Date	11/22/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.261
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.00 J	E9849-FS(0)	1.000	12/19/2022	0.875	2.39	4.79
PFHpA	375-85-9	1.60 J	E9849-FS(0)	1.000	12/19/2022	0.901	2.39	4.79
PFOA	335-67-1	1.42 J	E9849-FS(0)	1.000	12/19/2022	0.967	2.39	4.79
PFNA	375-95-1	2.39 U	E9849-FS(0)	1.000	12/19/2022	0.798	2.39	4.79
PFDA	335-76-2	2.39 U	E9849-FS(0)	1.000	12/19/2022	0.751	2.39	4.79
PFUnA	2058-94-8	2.39 U	E9849-FS(0)	1.000	12/19/2022	0.720	2.39	4.79
PFDoA	307-55-1	2.39 U	E9849-FS(0)	1.000	12/19/2022	0.728	2.39	4.79
PFTrDA	72629-94-8	2.39 U	E9849-FS(0)	1.000	12/19/2022	0.711	2.39	4.79
PFTeDA	376-06-7	2.39 U	E9849-FS(0)	1.000	12/19/2022	0.758	2.39	4.79
NMeFOSAA	2355-31-9	2.39 U	E9849-FS(0)	1.000	12/19/2022	0.987	2.39	4.79
NEtFOSAA	2991-50-6	2.39 U	E9849-FS(0)	1.000	12/19/2022	0.948	2.39	4.79
PFBS	375-73-5	2.63 J	E9849-FS(0)	1.000	12/19/2022	0.830	2.39	4.79
PFHxS	355-46-4	6.87	E9849-FS(0)	1.000	12/19/2022	0.955	2.39	4.79
PFOS	1763-23-1	14.5	E9849-FS(0)	1.000	12/19/2022	1.02	2.39	4.79
HFPO-DA	13252-13-6	2.39 U	E9849-FS(0)	1.000	12/19/2022	0.829	2.39	4.79
Adona	919005-14-4	2.39 U	E9849-FS(0)	1.000	12/19/2022	0.832	2.39	4.79
9Cl-PF3ONS	756426-58-1	2.39 U	E9849-FS(0)	1.000	12/19/2022	0.987	2.39	4.79
11Cl-PF3OUdS	763051-92-9	2.39 U	E9849-FS(0)	1.000	12/19/2022	0.863	2.39	4.79

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B1006-MW03-1122
Battelle ID	E9850-FS
Sample Type	SA
Collection Date	11/09/2022
Extraction Date	11/22/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.265
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	11.9	E9850-FS(0)	1.000	12/19/2022	0.861	2.36	4.72
PFHpA	**375-85-9**	**10.1**	**E9850-FS(0)**	**1.000**	**12/19/2022**	**0.888**	**2.36**	**4.72**
PFOA	335-67-1	5.69	E9850-FS(0)	1.000	12/19/2022	0.953	2.36	4.72
PFNA	**375-95-1**	**1.85 J**	**E9850-FS(0)**	**1.000**	**12/19/2022**	**0.786**	**2.36**	**4.72**
PFDA	335-76-2	2.36 U	E9850-FS(0)	1.000	12/19/2022	0.740	2.36	4.72
PFUnA	**2058-94-8**	**2.36 U**	**E9850-FS(0)**	**1.000**	**12/19/2022**	**0.709**	**2.36**	**4.72**
PFDoA	307-55-1	2.36 U	E9850-FS(0)	1.000	12/19/2022	0.717	2.36	4.72
PFTrDA	**72629-94-8**	**2.36 U**	**E9850-FS(0)**	**1.000**	**12/19/2022**	**0.700**	**2.36**	**4.72**
PFTeDA	376-06-7	2.36 U	E9850-FS(0)	1.000	12/19/2022	0.746	2.36	4.72
NMeFOSAA	**2355-31-9**	**2.36 U**	**E9850-FS(0)**	**1.000**	**12/19/2022**	**0.972**	**2.36**	**4.72**
NEtFOSAA	2991-50-6	2.36 U	E9850-FS(0)	1.000	12/19/2022	0.934	2.36	4.72
PFBS	**375-73-5**	**2.50 J**	**E9850-FS(0)**	**1.000**	**12/19/2022**	**0.817**	**2.36**	**4.72**
PFHxS	355-46-4	9.85 J	E9850-FS(0)	1.000	12/19/2022	0.941	2.36	4.72
PFOS	**1763-23-1**	**16.4**	**E9850-FS(0)**	**1.000**	**12/19/2022**	**1.01**	**2.36**	**4.72**
HFPO-DA	13252-13-6	2.36 U	E9850-FS(0)	1.000	12/19/2022	0.816	2.36	4.72
Adona	**919005-14-4**	**2.36 U**	**E9850-FS(0)**	**1.000**	**12/19/2022**	**0.820**	**2.36**	**4.72**
9Cl-PF3ONS	756426-58-1	2.36 U	E9850-FS(0)	1.000	12/19/2022	0.972	2.36	4.72
11Cl-PF3OUdS	**763051-92-9**	**2.36 U**	**E9850-FS(0)**	**1.000**	**12/19/2022**	**0.850**	**2.36**	**4.72**

OT

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-2063
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-OU2A2-SD01-0004	D0013-FS	Sediment
2	NBKK-OU2A2-SD02-0004	D0014-FS	Sediment
3	NBKK-OU2A2-SD03-0004	D0015-FS	Sediment

A Stage 2B/4 data validation was performed on the analytical data for three sediment samples collected on November 10, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times

- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- The samples exhibited several compounds that were reanalyzed outside holding time and were flagged (T) by the laboratory. However, the extracts were stored per draft method EPA Method 1633 which allows for a 90-day holding time. The (T) flags were removed.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-OU2A2-EB01-110722-SO	None - ND	-	-	-
NBKK-OU2A2-FB01-110822-SO	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R) except for the following.

EDS Sample	Surrogate	%R	Qualifier
3	13C2-PFTeDA	25%	UJ

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-SD01-0004
Battelle ID	D0013-FS
Sample Type	SA
Collection Date	11/10/2022
Extraction Date	11/22/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	31.15
Matrix	SOIL
Sample Size	4.820
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.519 U	D0013-FS(0)	1.000	12/17/2022	0.185	0.519	1.04
PFHpA	375-85-9	0.519 U	D0013-FS(0)	1.000	12/17/2022	0.174	0.519	1.04
PFOA	335-67-1	0.286 J	D0013-FS(0)	1.000	12/17/2022	0.222	0.519	1.04
PFNA	375-95-1	0.519 U	D0013-FS(0)	1.000	12/17/2022	0.163	0.519	1.04
PFDA	335-76-2	0.519 UJ	D0013-FS(0)	1.000	12/20/2022	0.164	0.519	1.04
PFUnA	2058-94-8	0.519 U	D0013-FS(0)	1.000	12/17/2022	0.162	0.519	1.04
PFDoA	307-55-1	0.519 U	D0013-FS(0)	1.000	12/17/2022	0.166	0.519	1.04
PFTrDA	72629-94-8	0.519 U	D0013-FS(0)	1.000	12/17/2022	0.167	0.519	1.04
PFTeDA	376-06-7	0.519 U	D0013-FS(0)	1.000	12/17/2022	0.168	0.519	2.07
NMeFOSAA	2355-31-9	0.519 U	D0013-FS(0)	1.000	12/17/2022	0.165	0.519	2.07
NEtFOSAA	2991-50-6	0.519 U	D0013-FS(0)	1.000	12/17/2022	0.171	0.519	2.07
PFBS	375-73-5	0.519 U	D0013-FS(0)	1.000	12/17/2022	0.177	0.519	1.04
PFHxS	355-46-4	0.519 U	D0013-FS(0)	1.000	12/17/2022	0.179	0.519	1.04
PFOS	1763-23-1	0.464 J	D0013-FS(0)	1.000	12/20/2022	0.182	0.519	1.04
HFPO-DA	13252-13-6	0.519 U	D0013-FS(0)	1.000	12/17/2022	0.165	0.519	2.07
Adona	919005-14-4	0.519 U	D0013-FS(0)	1.000	12/17/2022	0.166	0.519	2.07
9Cl-PF3ONS	756426-58-1	0.519 U	D0013-FS(0)	1.000	12/17/2022	0.160	0.519	2.07
11Cl-PF3OUdS	763051-92-9	0.519 U	D0013-FS(0)	1.000	12/17/2022	0.156	0.519	2.07

JW 3/6/23

Analyzed by: Harnden, Kelsey
Printed: 2/6/2023

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It can be done

2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-SD02-0004
Battelle ID	D0014-FS
Sample Type	SA
Collection Date	11/10/2022
Extraction Date	11/22/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	43.35
Matrix	SOIL
Sample Size	3.970
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.630 U	D0014-FS(0)	1.000	12/17/2022	0.224	0.630	1.26
PFHpA	**375-85-9**	**0.630 U**	**D0014-FS(0)**	**1.000**	**12/17/2022**	**0.212**	**0.630**	**1.26**
PFOA	335-67-1	0.630 U	D0014-FS(0)	1.000	12/17/2022	0.270	0.630	1.26
PFNA	**375-95-1**	**0.630 U**	**D0014-FS(0)**	**1.000**	**12/17/2022**	**0.198**	**0.630**	**1.26**
PFDA	335-76-2	0.630 U	D0014-FS(0)	1.000	12/20/2022	0.199	0.630	1.26
PFUnA	**2058-94-8**	**0.630 U**	**D0014-FS(0)**	**1.000**	**12/17/2022**	**0.196**	**0.630**	**1.26**
PFDoA	307-55-1	0.630 U	D0014-FS(0)	1.000	12/17/2022	0.202	0.630	1.26
PFTrDA	**72629-94-8**	**0.630 U**	**D0014-FS(0)**	**1.000**	**12/17/2022**	**0.203**	**0.630**	**1.26**
PFTeDA	376-06-7	0.630 U	D0014-FS(0)	1.000	12/17/2022	0.204	0.630	2.52
NMeFOSAA	**2355-31-9**	**0.630 U**	**D0014-FS(0)**	**1.000**	**12/17/2022**	**0.200**	**0.630**	**2.52**
NEtFOSAA	2991-50-6	0.630 U	D0014-FS(0)	1.000	12/17/2022	0.208	0.630	2.52
PFBS	**375-73-5**	**0.630 U**	**D0014-FS(0)**	**1.000**	**12/17/2022**	**0.215**	**0.630**	**1.26**
PFHxS	355-46-4	0.630 U	D0014-FS(0)	1.000	12/17/2022	0.218	0.630	1.26
PFOS	**1763-23-1**	**4.07**	**D0014-FS(0)**	**1.000**	**12/20/2022**	**0.220**	**0.630**	**1.26**
HFPO-DA	13252-13-6	0.630 U	D0014-FS(0)	1.000	12/17/2022	0.200	0.630	2.52
Adona	**919005-14-4**	**0.630 U**	**D0014-FS(0)**	**1.000**	**12/17/2022**	**0.202**	**0.630**	**2.52**
9Cl-PF3ONS	756426-58-1	0.630 U	D0014-FS(0)	1.000	12/17/2022	0.194	0.630	2.52
11Cl-PF3OUdS	**763051-92-9**	**0.630 U**	**D0014-FS(0)**	**1.000**	**12/17/2022**	**0.189**	**0.630**	**2.52**

NW 3/6/23
Analyzed by: Harnden, Kelsey
Printed: 2/6/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-SD03-0004
Battelle ID	D0015-FS
Sample Type	SA
Collection Date	11/10/2022
Extraction Date	11/22/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	68.97
Matrix	SOIL
Sample Size	2.170
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	1.15 U	D0015-FS(0)	1.000	12/17/2022	0.410	1.15	2.30	
PFHpA	**375-85-9**	**1.15 U**	**D0015-FS(0)**	**1.000**	**12/17/2022**	**0.387**	**1.15**	**2.30**	
PFOA	335-67-1	1.15 U	D0015-FS(0)	1.000	12/17/2022	0.493	1.15	2.30	
PFNA	**375-95-1**	**1.15 U**	**D0015-FS(0)**	**1.000**	**12/17/2022**	**0.362**	**1.15**	**2.30**	
PFDA	335-76-2	1.15 UJ	D0015-FS(0)	1.000	12/20/2022	0.364	1.15	2.30	
PFUnA	**2058-94-8**	**1.15 U**	**D0015-FS(0)**	**1.000**	**12/17/2022**	**0.359**	**1.15**	**2.30**	
PFDoA	307-55-1	1.15 U	D0015-FS(0)	1.000	12/17/2022	0.369	1.15	2.30	
PFTrDA	**72629-94-8**	**1.15 UJ**	**D0015-FS(0)**	**1.000**	**12/17/2022**	**0.371**	**1.15**	**2.30**	SSL
PFTeDA	376-06-7	1.15 UJ	D0015-FS(0)	1.000	12/17/2022	0.373	1.15	4.61	SSL
NMeFOSAA	**2355-31-9**	**1.15 U**	**D0015-FS(0)**	**1.000**	**12/17/2022**	**0.366**	**1.15**	**4.61**	
NEtFOSAA	2991-50-6	1.15 U	D0015-FS(0)	1.000	12/17/2022	0.380	1.15	4.61	
PFBS	**375-73-5**	**1.15 U**	**D0015-FS(0)**	**1.000**	**12/17/2022**	**0.394**	**1.15**	**2.30**	
PFHxS	355-46-4	1.15 U	D0015-FS(0)	1.000	12/17/2022	0.399	1.15	2.30	
PFOS	**1763-23-1**	**1.95 J**	**D0015-FS(0)**	**1.000**	**12/20/2022**	**0.403**	**1.15**	**2.30**	
HFPO-DA	13252-13-6	1.15 U	D0015-FS(0)	1.000	12/17/2022	0.366	1.15	4.61	
Adona	**919005-14-4**	**1.15 U**	**D0015-FS(0)**	**1.000**	**12/17/2022**	**0.369**	**1.15**	**4.61**	
9Cl-PF3ONS	756426-58-1	1.15 U	D0015-FS(0)	1.000	12/17/2022	0.355	1.15	4.61	
11Cl-PF3OUdS	**763051-92-9**	**1.15 U**	**D0015-FS(0)**	**1.000**	**12/17/2022**	**0.346**	**1.15**	**4.61**	

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

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Client ID	NBKK-OU2A2-SD03-0004
Battelle ID	D0015-FS
Sample Type	SA
Collection Date	11/10/2022
Extraction Date	11/22/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	69	D0015-FS(0)	12/17/2022
13C4-PFHpA	**84**	**D0015-FS(0)**	**12/17/2022**
13C8-PFOA	95	D0015-FS(0)	12/17/2022
13C9-PFNA	**80**	**D0015-FS(0)**	**12/17/2022**
13C6-PFDA	87	D0015-FS(0)	12/20/2022
13C7-PFUnA	**66**	**D0015-FS(0)**	**12/17/2022**
13C2-PFDoA	74	D0015-FS(0)	12/17/2022
13C2-PFTeDA	**25** N	**D0015-FS(0)**	**12/17/2022**
d3-MeFOSAA	107	D0015-FS(0)	12/20/2022
d5-EtFOSAA	**94**	**D0015-FS(0)**	**12/20/2022**
13C3-PFBS	145	D0015-FS(0)	12/20/2022
13C3-PFHxS	**130**	**D0015-FS(0)**	**12/20/2022**
13C8-PFOS	93	D0015-FS(0)	12/20/2022
13C3-HFPO-DA	**71**	**D0015-FS(0)**	**12/17/2022**

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Analyzed by: Harnden, Kelsey
Printed: 2/6/2023

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-2064
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-B76-EB01-111122-GW	D0005-FS	Water
2	NBKK-CF1-MW02-1122	D0006-FS	Water
3	NBKK-CF1-EB01-111122-GW	D0007-FS	Water
4	NBKK-B76-MW01-1122	D0008-FS	Water
5	NBKK-B76-MW02-1122	D0009-FS	Water
6	NBKK-CF1-MW03-1122	D0010-FS	Water
7	NBKK-B76-MW04-1122	D0011-FS	Water
8	NBKK-B76-MW03-1122	D0012-FS	Water

A Stage 2B/4 data validation was performed on the analytical data for six water samples and two aqueous equipment blank samples collected on November 10-14, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-B76-EB01-111122-GW	None - ND	-	-	-
NBKK-CF1-EB01-111122-GW	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R) except for the following.

LCS ID	Compound	%R	Qualifier	Affected Samples
DL117LCS-FS	PFUnA	135%	None	All Associated ND

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/7/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-EB01-111122-GW
Battelle ID	D0005-FS
Sample Type	SA
Collection Date	11/11/2022
Extraction Date	11/23/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.257
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.43 U	D0005-FS(0)	1.000	12/20/2022	0.888	2.43	4.86
PFHpA	375-85-9	2.43 U	D0005-FS(0)	1.000	12/20/2022	0.915	2.43	4.86
PFOA	335-67-1	2.43 U	D0005-FS(0)	1.000	12/20/2022	0.982	2.43	4.86
PFNA	375-95-1	2.43 U	D0005-FS(0)	1.000	12/20/2022	0.810	2.43	4.86
PFDA	335-76-2	2.43 U	D0005-FS(0)	1.000	12/20/2022	0.763	2.43	4.86
PFUnA	2058-94-8	2.43 U	D0005-FS(0)	1.000	12/20/2022	0.732	2.43	4.86
PFDoA	307-55-1	2.43 U	D0005-FS(0)	1.000	2/8/2023	0.739	2.43	4.86
PFTrDA	72629-94-8	2.43 U	D0005-FS(0)	1.000	12/20/2022	0.722	2.43	4.86
PFTeDA	376-06-7	2.43 U	D0005-FS(0)	1.000	12/20/2022	0.769	2.43	4.86
NMeFOSAA	2355-31-9	2.43 U	D0005-FS(0)	1.000	12/20/2022	1.00	2.43	4.86
NEtFOSAA	2991-50-6	2.43 U	D0005-FS(0)	1.000	12/20/2022	0.963	2.43	4.86
PFBS	375-73-5	2.43 U	D0005-FS(0)	1.000	12/20/2022	0.842	2.43	4.86
PFHxS	355-46-4	2.43 U	D0005-FS(0)	1.000	12/20/2022	0.970	2.43	4.86
PFOS	1763-23-1	2.43 U	D0005-FS(0)	1.000	12/20/2022	1.04	2.43	4.86
HFPO-DA	13252-13-6	2.43 U	D0005-FS(0)	1.000	12/20/2022	0.841	2.43	4.86
Adona	919005-14-4	2.43 U	D0005-FS(0)	1.000	12/20/2022	0.845	2.43	4.86
9Cl-PF3ONS	756426-58-1	2.43 U	D0005-FS(0)	1.000	12/20/2022	1.00	2.43	4.86
11Cl-PF3OUdS	763051-92-9	2.43 U	D0005-FS(0)	1.000	12/20/2022	0.876	2.43	4.86

NW 3/6/23

Analyzed by: Burkitt, Nathan
Printed: 2/10/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-CF1-MW02-1122
Battelle ID	D0006-FS
Sample Type	SA
Collection Date	11/14/2022
Extraction Date	11/23/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.266
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	38.1	D0006-FS(0)	1.000	12/20/2022	0.858	2.35	4.70
PFHpA	**375-85-9**	**11.3**	**D0006-FS(0)**	**1.000**	**12/20/2022**	**0.884**	**2.35**	**4.70**
PFOA	335-67-1	31.0	D0006-FS(0)	1.000	12/20/2022	0.949	2.35	4.70
PFNA	**375-95-1**	**2.35 U**	**D0006-FS(0)**	**1.000**	**12/20/2022**	**0.783**	**2.35**	**4.70**
PFDA	335-76-2	2.35 U	D0006-FS(0)	1.000	12/20/2022	0.737	2.35	4.70
PFUnA	**2058-94-8**	**2.35 U**	**D0006-FS(0)**	**1.000**	**12/20/2022**	**0.707**	**2.35**	**4.70**
PFDoA	307-55-1	2.35 U	D0006-FS(0)	1.000	2/8/2023	0.714	2.35	4.70
PFTrDA	**72629-94-8**	**2.35 U**	**D0006-FS(0)**	**1.000**	**12/20/2022**	**0.697**	**2.35**	**4.70**
PFTeDA	376-06-7	2.35 U	D0006-FS(0)	1.000	12/20/2022	0.743	2.35	4.70
NMeFOSAA	**2355-31-9**	**2.35 U**	**D0006-FS(0)**	**1.000**	**12/20/2022**	**0.968**	**2.35**	**4.70**
NEtFOSAA	2991-50-6	2.35 U	D0006-FS(0)	1.000	12/20/2022	0.930	2.35	4.70
PFBS	**375-73-5**	**32.0**	**D0006-FS(0)**	**1.000**	**12/20/2022**	**0.814**	**2.35**	**4.70**
PFHxS	355-46-4	543	D0006-FS(0)	1.000	12/20/2022	0.937	2.35	4.70
PFOS	**1763-23-1**	**897**	**D0006-FS(0)**	**1.000**	**12/20/2022**	**1.01**	**2.35**	**4.70**
HFPO-DA	13252-13-6	2.35 U	D0006-FS(0)	1.000	12/20/2022	0.813	2.35	4.70
Adona	**919005-14-4**	**2.35 U**	**D0006-FS(0)**	**1.000**	**12/20/2022**	**0.817**	**2.35**	**4.70**
9Cl-PF3ONS	756426-58-1	2.35 U	D0006-FS(0)	1.000	12/20/2022	0.968	2.35	4.70
11Cl-PF3OUdS	**763051-92-9**	**2.35 U**	**D0006-FS(0)**	**1.000**	**12/20/2022**	**0.847**	**2.35**	**4.70**

NW 3/6/23
Analyzed by: Burkitt, Nathan
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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

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Client ID	NBKK-CF1-EB01-111122-GW
Battelle ID	D0007-FS
Sample Type	SA
Collection Date	11/11/2022
Extraction Date	11/23/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.248
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.52 U	D0007-FS(0)	1.000	12/20/2022	0.920	2.52	5.04
PFHpA	375-85-9	2.52 U	D0007-FS(0)	1.000	12/20/2022	0.949	2.52	5.04
PFOA	335-67-1	2.52 U	D0007-FS(0)	1.000	12/20/2022	1.02	2.52	5.04
PFNA	375-95-1	2.52 U	D0007-FS(0)	1.000	12/20/2022	0.840	2.52	5.04
PFDA	335-76-2	2.52 U	D0007-FS(0)	1.000	12/20/2022	0.790	2.52	5.04
PFUnA	2058-94-8	2.52 U	D0007-FS(0)	1.000	12/20/2022	0.758	2.52	5.04
PFDoA	307-55-1	2.52 U	D0007-FS(0)	1.000	2/8/2023	0.766	2.52	5.04
PFTrDA	72629-94-8	2.52 U	D0007-FS(0)	1.000	12/20/2022	0.748	2.52	5.04
PFTeDA	376-06-7	2.52 U	D0007-FS(0)	1.000	12/20/2022	0.797	2.52	5.04
NMeFOSAA	2355-31-9	2.52 U	D0007-FS(0)	1.000	12/20/2022	1.04	2.52	5.04
NEtFOSAA	2991-50-6	2.52 U	D0007-FS(0)	1.000	12/20/2022	0.998	2.52	5.04
PFBS	375-73-5	2.52 U	D0007-FS(0)	1.000	12/20/2022	0.873	2.52	5.04
PFHxS	355-46-4	2.52 U	D0007-FS(0)	1.000	12/20/2022	1.01	2.52	5.04
PFOS	1763-23-1	2.52 U	D0007-FS(0)	1.000	12/20/2022	1.08	2.52	5.04
HFPO-DA	13252-13-6	2.52 U	D0007-FS(0)	1.000	12/20/2022	0.872	2.52	5.04
Adona	919005-14-4	2.52 U	D0007-FS(0)	1.000	12/20/2022	0.876	2.52	5.04
9Cl-PF3ONS	756426-58-1	2.52 U	D0007-FS(0)	1.000	12/20/2022	1.04	2.52	5.04
11Cl-PF3OUdS	763051-92-9	2.52 U	D0007-FS(0)	1.000	12/20/2022	0.908	2.52	5.04

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

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Client ID	NBKK-B76-MW01-1122
Battelle ID	D0008-FS
Sample Type	SA
Collection Date	11/11/2022
Extraction Date	11/23/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.277
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.26 U	D0008-FS(0)	1.000	12/20/2022	0.824	2.26	4.51
PFHpA	375-85-9	2.26 U	D0008-FS(0)	1.000	12/20/2022	0.849	2.26	4.51
PFOA	335-67-1	2.26 U	D0008-FS(0)	1.000	12/20/2022	0.912	2.26	4.51
PFNA	375-95-1	2.26 U	D0008-FS(0)	1.000	12/20/2022	0.752	2.26	4.51
PFDA	335-76-2	2.26 U	D0008-FS(0)	1.000	12/20/2022	0.708	2.26	4.51
PFUnA	2058-94-8	2.26 U	D0008-FS(0)	1.000	12/20/2022	0.679	2.26	4.51
PFDoA	307-55-1	2.26 UJ	D0008-FS(0)	1.000	2/8/2023	0.686	2.26	4.51
PFTrDA	72629-94-8	2.26 U	D0008-FS(0)	1.000	12/20/2022	0.670	2.26	4.51
PFTeDA	376-06-7	2.26 U	D0008-FS(0)	1.000	12/20/2022	0.714	2.26	4.51
NMeFOSAA	2355-31-9	2.26 U	D0008-FS(0)	1.000	12/20/2022	0.930	2.26	4.51
NEtFOSAA	2991-50-6	2.26 U	D0008-FS(0)	1.000	12/20/2022	0.894	2.26	4.51
PFBS	375-73-5	1.82 J	D0008-FS(0)	1.000	12/20/2022	0.782	2.26	4.51
PFHxS	355-46-4	3.51 J	D0008-FS(0)	1.000	12/20/2022	0.900	2.26	4.51
PFOS	1763-23-1	2.26 U	D0008-FS(0)	1.000	12/20/2022	0.966	2.26	4.51
HFPO-DA	13252-13-6	2.26 U	D0008-FS(0)	1.000	12/20/2022	0.781	2.26	4.51
Adona	919005-14-4	2.26 U	D0008-FS(0)	1.000	12/20/2022	0.784	2.26	4.51
9Cl-PF3ONS	756426-58-1	2.26 U	D0008-FS(0)	1.000	12/20/2022	0.930	2.26	4.51
11Cl-PF3OUdS	763051-92-9	2.26 U	D0008-FS(0)	1.000	12/20/2022	0.813	2.26	4.51

NW 3/6/23

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

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Client ID	NBKK-B76-MW02-1122
Battelle ID	D0009-FS
Sample Type	SA
Collection Date	11/11/2022
Extraction Date	11/23/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.277
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.26 U	D0009-FS(0)	1.000	12/20/2022	0.824	2.26	4.51
PFHpA	375-85-9	2.26 U	D0009-FS(0)	1.000	12/20/2022	0.849	2.26	4.51
PFOA	335-67-1	2.26 U	D0009-FS(0)	1.000	12/20/2022	0.912	2.26	4.51
PFNA	375-95-1	2.26 U	D0009-FS(0)	1.000	12/20/2022	0.752	2.26	4.51
PFDA	335-76-2	2.26 U	D0009-FS(0)	1.000	12/20/2022	0.708	2.26	4.51
PFUnA	2058-94-8	2.26 U	D0009-FS(0)	1.000	12/20/2022	0.679	2.26	4.51
PFDoA	307-55-1	2.26 U	D0009-FS(0)	1.000	2/8/2023	0.686	2.26	4.51
PFTrDA	72629-94-8	2.26 U	D0009-FS(0)	1.000	12/20/2022	0.670	2.26	4.51
PFTeDA	376-06-7	2.26 U	D0009-FS(0)	1.000	12/20/2022	0.714	2.26	4.51
NMeFOSAA	2355-31-9	2.26 U	D0009-FS(0)	1.000	12/20/2022	0.930	2.26	4.51
NEtFOSAA	2991-50-6	2.26 U	D0009-FS(0)	1.000	12/20/2022	0.894	2.26	4.51
PFBS	375-73-5	1.57 J	D0009-FS(0)	1.000	12/20/2022	0.782	2.26	4.51
PFHxS	355-46-4	2.09 J	D0009-FS(0)	1.000	12/20/2022	0.900	2.26	4.51
PFOS	1763-23-1	2.26 U	D0009-FS(0)	1.000	12/20/2022	0.966	2.26	4.51
HFPO-DA	13252-13-6	2.26 U	D0009-FS(0)	1.000	12/20/2022	0.781	2.26	4.51
Adona	919005-14-4	2.26 U	D0009-FS(0)	1.000	12/20/2022	0.784	2.26	4.51
9Cl-PF3ONS	756426-58-1	2.26 U	D0009-FS(0)	1.000	12/20/2022	0.930	2.26	4.51
11Cl-PF3OUdS	763051-92-9	2.26 U	D0009-FS(0)	1.000	12/20/2022	0.813	2.26	4.51

MW 3/6/23

Analyzed by: Burkitt, Nathan
Printed: 2/10/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

b

Client ID	NBKK-CF1-MW03-1122
Battelle ID	D0010-FS
Sample Type	SA
Collection Date	11/11/2022
Extraction Date	11/23/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.267
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	33.9	D0010-FS(0)	1.000	12/20/2022	0.855	2.34	4.68
PFHpA	375-85-9	17.8	D0010-FS(0)	1.000	12/20/2022	0.881	2.34	4.68
PFOA	335-67-1	33.0	D0010-FS(0)	1.000	12/20/2022	0.946	2.34	4.68
PFNA	375-95-1	2.34 U	D0010-FS(0)	1.000	12/20/2022	0.780	2.34	4.68
PFDA	335-76-2	2.34 U	D0010-FS(0)	1.000	12/20/2022	0.734	2.34	4.68
PFUnA	2058-94-8	2.34 U	D0010-FS(0)	1.000	12/20/2022	0.704	2.34	4.68
PFDoA	307-55-1	2.34 U	D0010-FS(0)	1.000	12/20/2022	0.712	2.34	4.68
PFTrDA	72629-94-8	2.34 U	D0010-FS(0)	1.000	12/20/2022	0.695	2.34	4.68
PFTeDA	376-06-7	2.34 U	D0010-FS(0)	1.000	12/20/2022	0.741	2.34	4.68
NMeFOSAA	2355-31-9	2.34 U	D0010-FS(0)	1.000	12/20/2022	0.964	2.34	4.68
NEtFOSAA	2991-50-6	2.34 U	D0010-FS(0)	1.000	12/20/2022	0.927	2.34	4.68
PFBS	375-73-5	15.5	D0010-FS(0)	1.000	12/20/2022	0.811	2.34	4.68
PFHxS	355-46-4	176	D0010-FS(0)	1.000	12/20/2022	0.934	2.34	4.68
PFOS	1763-23-1	288	D0010-FS(0)	1.000	12/20/2022	1.00	2.34	4.68
HFPO-DA	13252-13-6	2.34 U	D0010-FS(0)	1.000	12/20/2022	0.810	2.34	4.68
Adona	919005-14-4	2.34 U	D0010-FS(0)	1.000	12/20/2022	0.814	2.34	4.68
9Cl-PF3ONS	756426-58-1	2.34 U	D0010-FS(0)	1.000	12/20/2022	0.964	2.34	4.68
11Cl-PF3OUdS	763051-92-9	2.34 U	D0010-FS(0)	1.000	12/20/2022	0.844	2.34	4.68

NW 3/6/23

Analyzed by: Burkitt, Nathan
Printed: 2/10/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-MW04-1122
Battelle ID	D0011-FS
Sample Type	SA
Collection Date	11/10/2022
Extraction Date	11/23/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.270
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.845	2.31	4.63
PFHpA	375-85-9	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.871	2.31	4.63
PFOA	335-67-1	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.935	2.31	4.63
PFNA	375-95-1	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.771	2.31	4.63
PFDA	335-76-2	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.726	2.31	4.63
PFUnA	2058-94-8	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.696	2.31	4.63
PFDoA	307-55-1	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.704	2.31	4.63
PFTrDA	72629-94-8	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.687	2.31	4.63
PFTeDA	376-06-7	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.732	2.31	4.63
NMeFOSAA	2355-31-9	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.954	2.31	4.63
NEtFOSAA	2991-50-6	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.917	2.31	4.63
PFBS	375-73-5	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.802	2.31	4.63
PFHxS	355-46-4	1.11 J	D0011-FS(0)	1.000	12/20/2022	0.923	2.31	4.63
PFOS	1763-23-1	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.991	2.31	4.63
HFPO-DA	13252-13-6	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.801	2.31	4.63
Adona	919005-14-4	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.805	2.31	4.63
9Cl-PF3ONS	756426-58-1	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.954	2.31	4.63
11Cl-PF3OUdS	763051-92-9	2.31 U	D0011-FS(0)	1.000	12/20/2022	0.834	2.31	4.63

NW 3/6/23

Analyzed by: Burkitt, Nathan
Printed: 2/10/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-MW03-1122
Battelle ID	D0012-FS
Sample Type	SA
Collection Date	11/11/2022
Extraction Date	11/23/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.251
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.49 U	D0012-FS(0)	1.000	12/20/2022	0.909	2.49	4.98
PFHpA	375-85-9	2.49 U	D0012-FS(0)	1.000	12/20/2022	0.937	2.49	4.98
PFOA	335-67-1	2.49 U	D0012-FS(0)	1.000	12/20/2022	1.01	2.49	4.98
PFNA	375-95-1	2.49 U	D0012-FS(0)	1.000	12/20/2022	0.830	2.49	4.98
PFDA	335-76-2	2.49 U	D0012-FS(0)	1.000	12/20/2022	0.781	2.49	4.98
PFUnA	2058-94-8	2.49 U	D0012-FS(0)	1.000	12/20/2022	0.749	2.49	4.98
PFDoA	307-55-1	2.49 U	D0012-FS(0)	1.000	12/20/2022	0.757	2.49	4.98
PFTrDA	72629-94-8	2.49 U	D0012-FS(0)	1.000	12/20/2022	0.739	2.49	4.98
PFTeDA	376-06-7	2.49 U	D0012-FS(0)	1.000	12/20/2022	0.788	2.49	4.98
NMeFOSAA	2355-31-9	2.49 U	D0012-FS(0)	1.000	12/20/2022	1.03	2.49	4.98
NEtFOSAA	2991-50-6	2.49 U	D0012-FS(0)	1.000	12/20/2022	0.986	2.49	4.98
PFBS	375-73-5	2.49 U	D0012-FS(0)	1.000	12/20/2022	0.863	2.49	4.98
PFHxS	355-46-4	2.38 J	D0012-FS(0)	1.000	12/20/2022	0.993	2.49	4.98
PFOS	1763-23-1	2.49 U	D0012-FS(0)	1.000	12/20/2022	1.07	2.49	4.98
HFPO-DA	13252-13-6	2.49 U	D0012-FS(0)	1.000	12/20/2022	0.862	2.49	4.98
Adona	919005-14-4	2.49 U	D0012-FS(0)	1.000	12/20/2022	0.866	2.49	4.98
9Cl-PF3ONS	756426-58-1	2.49 U	D0012-FS(0)	1.000	12/20/2022	1.03	2.49	4.98
11Cl-PF3OUdS	763051-92-9	2.49 U	D0012-FS(0)	1.000	12/20/2022	0.897	2.49	4.98

MW 3/6/23

Analyzed by: Burkitt, Nathan
Printed: 2/10/2023

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-2154
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: March 6, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-OU2A5-MW01-1222	D0597-FS	Water
2	NBKK-OU2A5-MW03-1222	D0598-FS	Water
3	NBKK-S7-MW02-1222	D0599-FS	Water
3MS	NBKK-S7-MW02-1222MS	D0600-FSMS	Water
3MSD	NBKK-S7-MW02-1222MSD	D0601-FSMSD	Water
4	NBKK-S7-MW05-1222	D0602-FS	Water
5	NBKK-S7-MW05P-1222	D0603-FS	Water
6	NBKK-S7-FB-120222	D0604-FS	Water
7	NBKK-S7-MW04-1222	D0605-FS	Water
8	NBKK-S7-MW01-1222	D0606-FS	Water
9	NBKK-OU2A5-FB-120222	D0607-FS	Water

A Stage 2B/4 data validation was performed on the analytical data for seven water samples and two aqueous field blank samples collected on December 1-2, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- The samples were analyzed outside of holding time and were flagged (T) by the laboratory. However, the extracts were stored per draft method EPA Method 1633 which allows for a 90-day holding time. The (T) flags were removed.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-OU2A5-FB-120222	None - ND	-	-	-
NBKK-S7-FB-120222	None - ND	-	-	-

Surrogate Spike Recoveries

- Several samples exhibited high surrogate percent recoveries (%R) for several surrogate compounds. However, all associated compounds were non-detect and no qualifications were required. Please refer to the surrogate summaries on the Form Is for specific recoveries.

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R) except for the following.

LCS Sample	Compound	%R	Qualifier	Affected Samples
DL335LCS-FS	PFTeDA	58%	UJ	All Samples

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

Sample ID	Compound	MS %R/MSD %R/RPD	Qualifier
3	PFBS	69%/OK/OK	UJ
	NEtFOSAA	OK/OK/32.7%	None for RPD only

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	NBKK-S7-MW05-1222 ng/L	NBKK-S7-MW05P-1222 ng/L	RPD	Qualifier
None	ND	ND	-	-

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 3/21/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2AS-MW01-1222
Battelle ID	D0597-FS
Sample Type	SA
Collection Date	12/01/2022
Extraction Date	12/15/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.264
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	9.41	D0597-FS(0)	1.000	12/30/2022	0.865	2.37	4.73
PFHpA	375-85-9	7.61	D0597-FS(0)	1.000	12/30/2022	0.891	2.37	4.73
PFOA	335-67-1	27.9	D0597-FS(0)	1.000	12/30/2022	0.956	2.37	4.73
PFNA	375-95-1	2.37 UJ	D0597-FS(0)	1.000	2/15/2023	0.789	2.37	4.73
PFDA	335-76-2	2.37 U	D0597-FS(0)	1.000	12/30/2022	0.742	2.37	4.73
PFUnA	2058-94-8	2.37 U	D0597-FS(0)	1.000	12/30/2022	0.712	2.37	4.73
PFDoA	307-55-1	2.37 U	D0597-FS(0)	1.000	12/30/2022	0.720	2.37	4.73
PFTrDA	72629-94-8	2.37 U	D0597-FS(0)	1.000	12/30/2022	0.703	2.37	4.73
PFTeDA	376-06-7	2.37 UJ	D0597-FS(0)	1.000	12/30/2022	0.749	2.37	4.73
NMeFOSAA	2355-31-9	2.37 U	D0597-FS(0)	1.000	12/30/2022	0.975	2.37	4.73
NEtFOSAA	2991-50-6	2.37 U	D0597-FS(0)	1.000	12/30/2022	0.938	2.37	4.73
PFBS	375-73-5	2.37 UJ	D0597-FS(0)	1.000	2/15/2023	0.820	2.37	4.73
PFHxS	355-46-4	8.99	D0597-FS(0)	1.000	12/30/2022	0.944	2.37	4.73
PFOS	1763-23-1	47.7	D0597-FS(0)	1.000	12/30/2022	1.01	2.37	4.73
HFPO-DA	13252-13-6	2.37 U	D0597-FS(0)	1.000	12/30/2022	0.819	2.37	4.73
Adona	919005-14-4	2.37 U	D0597-FS(0)	1.000	12/30/2022	0.823	2.37	4.73
9Cl-PF3ONS	756426-58-1	2.37 U	D0597-FS(0)	1.000	12/30/2022	0.975	2.37	4.73
11Cl-PF3OUdS	763051-92-9	2.37 U	D0597-FS(0)	1.000	12/30/2022	0.853	2.37	4.73

BS C

NW 316123

Analyzed by: Harnden, Kelsey
Printed: 2/16/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A5-MW01-1222
Battelle ID	D0597-FS
Sample Type	SA
Collection Date	12/01/2022
Extraction Date	12/15/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	112	D0597-FS(0)	12/30/2022
13C4-PFHpA	136	D0597-FS(0)	12/30/2022
13C8-PFOA	122	D0597-FS(0)	12/30/2022
13C9-PFNA	133	D0597-FS(0)	2/15/2023
13C6-PFDA	115	D0597-FS(0)	12/30/2022
13C7-PFUnA	153	D0597-FS(0)	12/30/2022
13C2-PFDoA	105	D0597-FS(0)	12/30/2022
13C2-PFTeDA	105	D0597-FS(0)	12/30/2022
d3-MeFOSAA	105	D0597-FS(0)	12/30/2022
d5-EtFOSAA	158	D0597-FS(0)	12/30/2022
13C3-PFBS	108	D0597-FS(0)	2/15/2023
13C3-PFHxS	130	D0597-FS(0)	12/30/2022
13C8-PFOS	114	D0597-FS(0)	12/30/2022
13C3-HFPO-DA	131	D0597-FS(0)	12/30/2022

nw 3/6/23

Analyzed by: Harnden, Kelsey
Printed: 2/16/2023

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It can be done

2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A5-MW03-1222
Battelle ID	D0598-FS
Sample Type	SA
Collection Date	12/01/2022
Extraction Date	12/15/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.278
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	5.89	D0598-FS(0)	1.000	12/30/2022	0.821	2.25	4.50
PFHpA	375-85-9	4.68	D0598-FS(0)	1.000	12/30/2022	0.846	2.25	4.50
PFOA	335-67-1	12.8	D0598-FS(0)	1.000	12/30/2022	0.908	2.25	4.50
PFNA	375-95-1	2.25 U	D0598-FS(0)	1.000	2/15/2023	0.749	2.25	4.50
PFDA	335-76-2	2.25 U	D0598-FS(0)	1.000	12/30/2022	0.705	2.25	4.50
PFUnA	2058-94-8	2.25 U	D0598-FS(0)	1.000	12/30/2022	0.676	2.25	4.50
PFDoA	307-55-1	2.25 U	D0598-FS(0)	1.000	12/30/2022	0.683	2.25	4.50
PFTrDA	72629-94-8	2.25 U	D0598-FS(0)	1.000	12/30/2022	0.667	2.25	4.50
PFTeDA	376-06-7	2.25 U	D0598-FS(0)	1.000	12/30/2022	0.711	2.25	4.50
NMeFOSAA	2355-31-9	2.25 U	D0598-FS(0)	1.000	12/30/2022	0.926	2.25	4.50
NEtFOSAA	2991-50-6	2.25 U	D0598-FS(0)	1.000	12/30/2022	0.890	2.25	4.50
PFBS	375-73-5	3.13 J	D0598-FS(0)	1.000	2/15/2023	0.779	2.25	4.50
PFHxS	355-46-4	6.41	D0598-FS(0)	1.000	12/30/2022	0.897	2.25	4.50
PFOS	1763-23-1	31.7	D0598-FS(0)	1.000	12/30/2022	0.962	2.25	4.50
HFPO-DA	13252-13-6	2.25 U	D0598-FS(0)	1.000	12/30/2022	0.778	2.25	4.50
Adona	919005-14-4	2.25 U	D0598-FS(0)	1.000	12/30/2022	0.781	2.25	4.50
9Cl-PF3ONS	756426-58-1	2.25 U	D0598-FS(0)	1.000	12/30/2022	0.926	2.25	4.50
11Cl-PF3OUdS	763051-92-9	2.25 U	D0598-FS(0)	1.000	12/30/2022	0.810	2.25	4.50

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-S7-MW02-1222
Battelle ID	D0599-FS
Sample Type	SA
Collection Date	12/02/2022
Extraction Date	12/15/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.273
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	2.29 U	D0599-FS(0)	1.000	12/30/2022	0.836	2.29	4.58	
PFHpA	375-85-9	2.29 U	D0599-FS(0)	1.000	12/30/2022	0.862	2.29	4.58	
PFOA	335-67-1	2.29 U	D0599-FS(0)	1.000	12/30/2022	0.925	2.29	4.58	
PFNA	375-95-1	2.29 U	D0599-FS(0)	1.000	2/15/2023	0.763	2.29	4.58	
PFDA	335-76-2	2.29 U	D0599-FS(0)	1.000	12/30/2022	0.718	2.29	4.58	
PFUnA	2058-94-8	2.29 U	D0599-FS(0)	1.000	12/30/2022	0.689	2.29	4.58	
PFDoA	307-55-1	2.29 U	D0599-FS(0)	1.000	12/30/2022	0.696	2.29	4.58	
PFTrDA	72629-94-8	2.29 U	D0599-FS(0)	1.000	12/30/2022	0.679	2.29	4.58	
PFTeDA	376-06-7	2.29 UJ	D0599-FS(0)	1.000	12/30/2022	0.724	2.29	4.58	BSL
NMeFOSAA	2355-31-9	2.29 U	D0599-FS(0)	1.000	12/30/2022	0.943	2.29	4.58	
NEtFOSAA	2991-50-6	2.29 U	D0599-FS(0)	1.000	12/30/2022	0.907	2.29	4.58	
PFBS	375-73-5	2.29 UJ	D0599-FS(0)	1.000	2/15/2023	0.793	2.29	4.58	MSL
PFHxS	355-46-4	2.29 U	D0599-FS(0)	1.000	12/30/2022	0.913	2.29	4.58	
PFOS	1763-23-1	2.29 U	D0599-FS(0)	1.000	12/30/2022	0.980	2.29	4.58	
HFPO-DA	13252-13-6	2.29 U	D0599-FS(0)	1.000	12/30/2022	0.792	2.29	4.58	
Adona	919005-14-4	2.29 U	D0599-FS(0)	1.000	12/30/2022	0.796	2.29	4.58	
9Cl-PF3ONS	756426-58-1	2.29 U	D0599-FS(0)	1.000	12/30/2022	0.943	2.29	4.58	
11Cl-PF3OUdS	763051-92-9	2.29 U	D0599-FS(0)	1.000	12/30/2022	0.825	2.29	4.58	

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No : G25161.X1.XX.0026.000001

Client ID	NBKK-S7-MW05-1222
Battelle ID	D0602-FS
Sample Type	SA
Collection Date	12/02/2022
Extraction Date	12/15/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.278
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	2.25 U	D0602-FS(0)	1.000	12/30/2022	0.821	2.25	4.50	
PFHpA	375-85-9	2.25 U	D0602-FS(0)	1.000	12/30/2022	0.846	2.25	4.50	
PFOA	335-67-1	2.25 U	D0602-FS(0)	1.000	12/30/2022	0.908	2.25	4.50	
PFNA	375-95-1	2.25 UJ	D0602-FS(0)	1.000	2/15/2023	0.749	2.25	4.50	
PFDA	335-76-2	2.25 U	D0602-FS(0)	1.000	12/30/2022	0.705	2.25	4.50	
PFUnA	2058-94-8	2.25 U	D0602-FS(0)	1.000	12/30/2022	0.676	2.25	4.50	
PFDoA	307-55-1	2.25 U	D0602-FS(0)	1.000	12/30/2022	0.683	2.25	4.50	
PFTrDA	72629-94-8	2.25 U	D0602-FS(0)	1.000	12/30/2022	0.667	2.25	4.50	
PFTeDA	376-06-7	2.25 UJ	D0602-FS(0)	1.000	12/30/2022	0.711	2.25	4.50	BSL
NMeFOSAA	2355-31-9	2.25 U	D0602-FS(0)	1.000	12/30/2022	0.926	2.25	4.50	
NEtFOSAA	2991-50-6	2.25 U	D0602-FS(0)	1.000	12/30/2022	0.890	2.25	4.50	
PFBS	375-73-5	2.25 UJ	D0602-FS(0)	1.000	2/15/2023	0.779	2.25	4.50	
PFHxS	355-46-4	2.25 U	D0602-FS(0)	1.000	12/30/2022	0.897	2.25	4.50	
PFOS	1763-23-1	2.25 U	D0602-FS(0)	1.000	12/30/2022	0.962	2.25	4.50	
HFPO-DA	13252-13-6	2.25 U	D0602-FS(0)	1.000	12/30/2022	0.778	2.25	4.50	
Adona	919005-14-4	2.25 U	D0602-FS(0)	1.000	12/30/2022	0.781	2.25	4.50	
9Cl-PF3ONS	756426-58-1	2.25 U	D0602-FS(0)	1.000	12/30/2022	0.926	2.25	4.50	
11Cl-PF3OUdS	763051-92-9	2.25 U	D0602-FS(0)	1.000	12/30/2022	0.810	2.25	4.50	

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161-X1-XX-0026-000001

Client ID	NBKK-S7-MW05P-1222
Battelle ID	D0603-FS
Sample Type	SA
Collection Date	12/02/2022
Extraction Date	12/15/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.273
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	2.29 U	D0603-FS(0)	1.000	12/30/2022	0.836	2.29	4.58	
PFHpA	375-85-9	2.29 U	D0603-FS(0)	1.000	12/30/2022	0.862	2.29	4.58	
PFOA	335-67-1	2.29 U	D0603-FS(0)	1.000	12/30/2022	0.925	2.29	4.58	
PFNA	375-95-1	2.29 UJ	D0603-FS(0)	1.000	2/15/2023	0.763	2.29	4.58	
PFDA	335-76-2	2.29 U	D0603-FS(0)	1.000	12/30/2022	0.718	2.29	4.58	
PFUnA	2058-94-8	2.29 U	D0603-FS(0)	1.000	12/30/2022	0.689	2.29	4.58	
PFDoA	307-55-1	2.29 U	D0603-FS(0)	1.000	12/30/2022	0.696	2.29	4.58	
PFTrDA	72629-94-8	2.29 U	D0603-FS(0)	1.000	12/30/2022	0.679	2.29	4.58	
PFTeDA	376-06-7	2.29 UJ	D0603-FS(0)	1.000	12/30/2022	0.724	2.29	4.58	BSL
NMeFOSAA	2355-31-9	2.29 U	D0603-FS(0)	1.000	12/30/2022	0.943	2.29	4.58	
NEtFOSAA	2991-50-6	2.29 U	D0603-FS(0)	1.000	12/30/2022	0.907	2.29	4.58	
PFBS	375-73-5	2.29 UJ	D0603-FS(0)	1.000	2/15/2023	0.793	2.29	4.58	
PFHxS	355-46-4	2.29 U	D0603-FS(0)	1.000	12/30/2022	0.913	2.29	4.58	
PFOS	1763-23-1	2.29 U	D0603-FS(0)	1.000	12/30/2022	0.980	2.29	4.58	
HFPO-DA	13252-13-6	2.29 U	D0603-FS(0)	1.000	12/30/2022	0.792	2.29	4.58	
Adona	919005-14-4	2.29 U	D0603-FS(0)	1.000	12/30/2022	0.796	2.29	4.58	
9Cl-PF3ONS	756426-58-1	2.29 U	D0603-FS(0)	1.000	12/30/2022	0.943	2.29	4.58	
11Cl-PF3OUdS	763051-92-9	2.29 U	D0603-FS(0)	1.000	12/30/2022	0.825	2.29	4.58	

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-S7-FB-120222
Battelle ID	D0604-FS
Sample Type	SA
Collection Date	12/02/2022
Extraction Date	12/15/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.250
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	2.50 U	D0604-FS(0)	1.000	12/30/2022	0.913	2.50	5.00	
PFHpA	375-85-9	2.50 U	D0604-FS(0)	1.000	12/30/2022	0.941	2.50	5.00	
PFOA	335-67-1	2.50 U	D0604-FS(0)	1.000	12/30/2022	1.01	2.50	5.00	
PFNA	375-95-1	2.50 UJ	D0604-FS(0)	1.000	2/15/2023	0.833	2.50	5.00	
PFDA	335-76-2	2.50 U	D0604-FS(0)	1.000	12/30/2022	0.784	2.50	5.00	
PFUnA	2058-94-8	2.50 U	D0604-FS(0)	1.000	12/30/2022	0.752	2.50	5.00	
PFDoA	307-55-1	2.50 U	D0604-FS(0)	1.000	12/30/2022	0.760	2.50	5.00	
PFTrDA	72629-94-8	2.50 U	D0604-FS(0)	1.000	12/30/2022	0.742	2.50	5.00	
PFTeDA	376-06-7	2.50 UJ	D0604-FS(0)	1.000	12/30/2022	0.791	2.50	5.00	BSL
NMeFOSAA	2355-31-9	2.50 U	D0604-FS(0)	1.000	12/30/2022	1.03	2.50	5.00	
NEtFOSAA	2991-50-6	2.50 U	D0604-FS(0)	1.000	12/30/2022	0.990	2.50	5.00	
PFBS	375-73-5	2.50 UJ	D0604-FS(0)	1.000	2/15/2023	0.866	2.50	5.00	
PFHxS	355-46-4	2.50 U	D0604-FS(0)	1.000	12/30/2022	0.997	2.50	5.00	
PFOS	1763-23-1	2.50 U	D0604-FS(0)	1.000	12/30/2022	1.07	2.50	5.00	
HFPO-DA	13252-13-6	2.50 U	D0604-FS(0)	1.000	12/30/2022	0.865	2.50	5.00	
Adona	919005-14-4	2.50 U	D0604-FS(0)	1.000	12/30/2022	0.869	2.50	5.00	
9Cl-PF3ONS	756426-58-1	2.50 U	D0604-FS(0)	1.000	12/30/2022	1.03	2.50	5.00	
11Cl-PF3OUdS	763051-92-9	2.50 U	D0604-FS(0)	1.000	12/30/2022	0.901	2.50	5.00	

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Analyzed by: Harnden, Kelsey
Printed: 2/16/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-S7-FB-120222
Battelle ID	D0604-FS
Sample Type	SA
Collection Date	12/02/2022
Extraction Date	12/15/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	130	D0604-FS(0)	12/30/2022
13C4-PFHpA	**124**	**D0604-FS(0)**	**12/30/2022**
13C8-PFOA	133	D0604-FS(0)	12/30/2022
13C9-PFNA	**121**	**D0604-FS(0)**	**2/15/2023**
13C6-PFDA	141	D0604-FS(0)	12/30/2022
13C7-PFUnA	**153**	**D0604-FS(0)**	**12/30/2022**
13C2-PFDoA	104	D0604-FS(0)	12/30/2022
13C2-PFTeDA	**118**	**D0604-FS(0)**	**12/30/2022**
d3-MeFOSAA	99	D0604-FS(0)	12/30/2022
d5-EtFOSAA	**108**	**D0604-FS(0)**	**12/30/2022**
13C3-PFBS	125	D0604-FS(0)	2/15/2023
13C3-PFHxS	**128**	**D0604-FS(0)**	**12/30/2022**
13C8-PFOS	113	D0604-FS(0)	12/30/2022
13C3-HFPO-DA	**97**	**D0604-FS(0)**	**12/30/2022**

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-S7-MW04-1222
Battelle ID	D0605-FS
Sample Type	SA
Collection Date	12/02/2022
Extraction Date	12/15/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.261
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	1.93 J	D0605-FS(0)	1.000	12/30/2022	0.875	2.39	4.79	
PFHpA	375-85-9	2.49 J	D0605-FS(0)	1.000	12/30/2022	0.901	2.39	4.79	
PFOA	335-67-1	1.44 J	D0605-FS(0)	1.000	12/30/2022	0.967	2.39	4.79	
PFNA	375-95-1	2.39 U	D0605-FS(0)	1.000	2/15/2023	0.798	2.39	4.79	
PFDA	335-76-2	2.39 U	D0605-FS(0)	1.000	12/30/2022	0.751	2.39	4.79	
PFUnA	2058-94-8	2.39 U	D0605-FS(0)	1.000	12/30/2022	0.720	2.39	4.79	
PFDoA	307-55-1	2.39 U	D0605-FS(0)	1.000	12/30/2022	0.728	2.39	4.79	
PFTrDA	72629-94-8	2.39 U	D0605-FS(0)	1.000	12/30/2022	0.711	2.39	4.79	
PFTeDA	376-06-7	2.39 UJ	D0605-FS(0)	1.000	12/30/2022	0.758	2.39	4.79	BSL
NMeFOSAA	2355-31-9	2.39 U	D0605-FS(0)	1.000	12/30/2022	0.987	2.39	4.79	
NEtFOSAA	2991-50-6	2.39 U	D0605-FS(0)	1.000	12/30/2022	0.948	2.39	4.79	
PFBS	375-73-5	4.81 J	D0605-FS(0)	1.000	2/15/2023	0.830	2.39	4.79	
PFHxS	355-46-4	2.39 U	D0605-FS(0)	1.000	12/30/2022	0.955	2.39	4.79	
PFOS	1763-23-1	2.39 U	D0605-FS(0)	1.000	12/30/2022	1.02	2.39	4.79	
HFPO-DA	13252-13-6	2.39 U	D0605-FS(0)	1.000	12/30/2022	0.829	2.39	4.79	
Adona	919005-14-4	2.39 U	D0605-FS(0)	1.000	12/30/2022	0.832	2.39	4.79	
9Cl-PF3ONS	756426-58-1	2.39 U	D0605-FS(0)	1.000	12/30/2022	0.987	2.39	4.79	
11Cl-PF3OUdS	763051-92-9	2.39 U	D0605-FS(0)	1.000	12/30/2022	0.863	2.39	4.79	

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Analyzed by: Harnden, Kelsey
Printed: 2/16/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-S7-MW04-1222
Battelle ID	D0605-FS
Sample Type	SA
Collection Date	12/02/2022
Extraction Date	12/15/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	129	D0605-FS(0)	12/30/2022
13C4-PFHpA	**133**	**D0605-FS(0)**	**12/30/2022**
13C8-PFOA	133	D0605-FS(0)	12/30/2022
13C9-PFNA	**133**	**D0605-FS(0)**	**2/15/2023**
13C6-PFDA	164	D0605-FS(0)	12/30/2022
13C7-PFUnA	**113**	**D0605-FS(0)**	**12/30/2022**
13C2-PFDoA	141	D0605-FS(0)	12/30/2022
13C2-PFTeDA	**93**	**D0605-FS(0)**	**12/30/2022**
d3-MeFOSAA	87	D0605-FS(0)	12/30/2022
d5-EtFOSAA	**96**	**D0605-FS(0)**	**12/30/2022**
13C3-PFBS	134	D0605-FS(0)	2/15/2023
13C3-PFHxS	**121**	**D0605-FS(0)**	**12/30/2022**
13C8-PFOS	100	D0605-FS(0)	12/30/2022
13C3-HFPO-DA	**122**	**D0605-FS(0)**	**12/30/2022**

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Analyzed by: Harnden, Kelsey
Printed: 2/16/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-S7-MW01-1222
Battelle ID	D0606-FS
Sample Type	SA
Collection Date	12/02/2022
Extraction Date	12/15/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.273
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	2.29 U	D0606-FS(0)	1.000	12/30/2022	0.836	2.29	4.58	
PFHpA	375-85-9	2.29 U	D0606-FS(0)	1.000	12/30/2022	0.862	2.29	4.58	
PFOA	335-67-1	2.29 U	D0606-FS(0)	1.000	12/30/2022	0.925	2.29	4.58	
PFNA	375-95-1	2.29 U	D0606-FS(0)	1.000	2/15/2023	0.763	2.29	4.58	
PFDA	335-76-2	2.29 U	D0606-FS(0)	1.000	12/30/2022	0.718	2.29	4.58	
PFUnA	2058-94-8	2.29 U	D0606-FS(0)	1.000	12/30/2022	0.689	2.29	4.58	
PFDoA	307-55-1	2.29 U	D0606-FS(0)	1.000	12/30/2022	0.696	2.29	4.58	
PFTrDA	72629-94-8	2.29 U	D0606-FS(0)	1.000	12/30/2022	0.679	2.29	4.58	
PFTeDA	376-06-7	2.29 U	D0606-FS(0)	1.000	12/30/2022	0.724	2.29	4.58	BSL
NMeFOSAA	2355-31-9	2.29 U	D0606-FS(0)	1.000	12/30/2022	0.943	2.29	4.58	
NEtFOSAA	2991-50-6	2.29 U	D0606-FS(0)	1.000	12/30/2022	0.907	2.29	4.58	
PFBS	375-73-5	2.29 U	D0606-FS(0)	1.000	2/15/2023	0.793	2.29	4.58	
PFHxS	355-46-4	2.29 U	D0606-FS(0)	1.000	12/30/2022	0.913	2.29	4.58	
PFOS	1763-23-1	2.29 U	D0606-FS(0)	1.000	12/30/2022	0.980	2.29	4.58	
HFPO-DA	13252-13-6	2.29 U	D0606-FS(0)	1.000	12/30/2022	0.792	2.29	4.58	
Adona	919005-14-4	2.29 U	D0606-FS(0)	1.000	12/30/2022	0.796	2.29	4.58	
9Cl-PF3ONS	756426-58-1	2.29 U	D0606-FS(0)	1.000	12/30/2022	0.943	2.29	4.58	
11Cl-PF3OUdS	763051-92-9	2.29 U	D0606-FS(0)	1.000	12/30/2022	0.825	2.29	4.58	

MW 3/1/23

Analyzed by: Harnden, Kelsey
Printed: 2/16/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161-X1.XX.0026.000001

Client ID	NBKK-S7-MW01-1222
Battelle ID	D0606-FS
Sample Type	SA
Collection Date	12/02/2022
Extraction Date	12/15/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	140	D0606-FS(0)	12/30/2022
13C4-PFHpA	**154**	**D0606-FS(0)**	**12/30/2022**
13C8-PFOA	133	D0606-FS(0)	12/30/2022
13C9-PFNA	**128**	**D0606-FS(0)**	**2/15/2023**
13C6-PFDA	125	D0606-FS(0)	12/30/2022
13C7-PFUnA	**105**	**D0606-FS(0)**	**12/30/2022**
13C2-PFDoA	83	D0606-FS(0)	12/30/2022
13C2-PFTeDA	**104**	**D0606-FS(0)**	**12/30/2022**
d3-MeFOSAA	89	D0606-FS(0)	12/30/2022
d5-EtFOSAA	**101**	**D0606-FS(0)**	**12/30/2022**
13C3-PFBS	121	D0606-FS(0)	2/15/2023
13C3-PFHxS	**136**	**D0606-FS(0)**	**12/30/2022**
13C8-PFOS	132	D0606-FS(0)	12/30/2022
13C3-HFPO-DA	**132**	**D0606-FS(0)**	**12/30/2022**

BATTELLE
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9

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A5-FB-120222
Battelle ID	D0607-FS
Sample Type	SA
Collection Date	12/02/2022
Extraction Date	12/15/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.271
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.31 U	D0607-FS(0)	1.000	12/30/2022	0.842	2.31	4.61
PFHpA	375-85-9	2.31 U	D0607-FS(0)	1.000	12/30/2022	0.868	2.31	4.61
PFOA	335-67-1	2.31 U	D0607-FS(0)	1.000	12/30/2022	0.932	2.31	4.61
PFNA	375-95-1	2.31 UJ	D0607-FS(0)	1.000	2/15/2023	0.768	2.31	4.61
PFDA	335-76-2	2.31 U	D0607-FS(0)	1.000	12/30/2022	0.723	2.31	4.61
PFUnA	2058-94-8	2.31 U	D0607-FS(0)	1.000	12/30/2022	0.694	2.31	4.61
PFDoA	307-55-1	2.31 U	D0607-FS(0)	1.000	12/30/2022	0.701	2.31	4.61
PFTrDA	72629-94-8	2.31 U	D0607-FS(0)	1.000	12/30/2022	0.685	2.31	4.61
PFTeDA	376-06-7	2.31 UJ	D0607-FS(0)	1.000	12/30/2022	0.730	2.31	4.61
NMeFOSAA	2355-31-9	2.31 U	D0607-FS(0)	1.000	12/30/2022	0.950	2.31	4.61
NEtFOSAA	2991-50-6	2.31 U	D0607-FS(0)	1.000	12/30/2022	0.913	2.31	4.61
PFBS	375-73-5	2.31 UJ	D0607-FS(0)	1.000	2/15/2023	0.799	2.31	4.61
PFHxS	355-46-4	2.31 U	D0607-FS(0)	1.000	12/30/2022	0.920	2.31	4.61
PFOS	1763-23-1	2.31 U	D0607-FS(0)	1.000	12/30/2022	0.987	2.31	4.61
HFPO-DA	13252-13-6	2.31 U	D0607-FS(0)	1.000	12/30/2022	0.798	2.31	4.61
Adona	919005-14-4	2.31 U	D0607-FS(0)	1.000	12/30/2022	0.802	2.31	4.61
9Cl-PF3ONS	756426-58-1	2.31 U	D0607-FS(0)	1.000	12/30/2022	0.950	2.31	4.61
11Cl-PF3OUdS	763051-92-9	2.31 U	D0607-FS(0)	1.000	12/30/2022	0.831	2.31	4.61

BSL

MW 3/6/23

Analyzed by: Harnden, Kelsey
Printed: 2/16/2023

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R can be done

9

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A5-FB-120222
Battelle ID	D0607-FS
Sample Type	SA
Collection Date	12/02/2022
Extraction Date	12/15/2022
Analytical Instrument	Sciex 6500+ (AF) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	149	D0607-FS(0)	12/30/2022
13C4-PFHpA	**143**	**D0607-FS(0)**	**12/30/2022**
13C8-PFOA	153	D0607-FS(0)	12/30/2022
13C9-PFNA	**117**	**D0607-FS(0)**	**2/15/2023**
13C6-PFDA	130	D0607-FS(0)	12/30/2022
13C7-PFUnA	**121**	**D0607-FS(0)**	**12/30/2022**
13C2-PFDoA	100	D0607-FS(0)	12/30/2022
13C2-PFTeDA	**114**	**D0607-FS(0)**	**12/30/2022**
d3-MeFOSAA	81	D0607-FS(0)	12/30/2022
d5-EtFOSAA	**111**	**D0607-FS(0)**	**12/30/2022**
13C3-PFBS	118	D0607-FS(0)	2/15/2023
13C3-PFHxS	**162**	**D0607-FS(0)**	**12/30/2022**
13C8-PFOS	106	D0607-FS(0)	12/30/2022
13C3-HFPO-DA	**121**	**D0607-FS(0)**	**12/30/2022**

MW 3/6/23
Analyzed by: Harnden, Kelsey
Printed: 2/16/2023

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 22-2184
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: May 21, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-OU2A2-MW06-1222	D0830-FS	Water
2	NBKK-OU2A2-MW02-1222	D0831-FS	Water
3	NBKK-OU2A2-MW2-8-1222	D0832-FS	Water
4	NBKK-OU2A2-MW2-8P-1222	D0833-FS	Water
5	NBKK-OU2A2-MW03P-1222	D0835-FS	Water
6	NBKK-OU2A2-MW03-1222	D0836-FS	Water
6MS	NBKK-OU2A2-MW03-1222MS	D0834-FSMS	Water
6MSD	NBKK-OU2A2-MW03-1222MSD	D0829-FSMSD	Water
7	NBKK-CF1-MW01-1222	D0837-FS	Water
8	NBKK-OU2A5-MW02-1222	D0838-FS	Water
9	NBKK-B1006-MW04-1222	D0839-FS	Water
10	NBKK-B1006-MW04P-1222	D0840-FS	Water
11	NBKK-OU2A2-MW05-1222	D0841-FS	Water
12	NBKK-OU2A2-MW04-1222	D0842-FS	Water

A Stage 2B/4 data validation was performed on the analytical data for eleven water samples and one aqueous equipment blank sample collected on December 7-8, 2022 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, and 4 Revised Blank Qualification Table, May 2021;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC samples were not collected.

Surrogate Spike Recoveries

- Several samples exhibited low surrogate percent recoveries (%R) for several surrogate compounds. All associated compounds were qualified (UJ) in the samples. Please refer to the surrogate summaries on the Form Is for specific recoveries.

Laboratory Fortified Blank (LFB)

- The LFB samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

Sample ID	Compound	MS %R/MSD %R/RPD	Qualifier
6	PFUnA	OK/140%/OK	None - Sample ND

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria except for the following.

EDS Sample	Internal Standard	Area Count	Qualifier
3	13C2-PFOA	Low	J/UJ - Associated Cmpds
4	13C2-PFOA	Low	

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- EDS Samples 7 and 9 exhibited PFHxA with an ion ratio outside of QC limits that were flagged (Q) by the laboratory. These results were qualified as estimated (J).
- EDS Sample 3 exhibited PFNA with an ion ratio outside of QC limits that was flagged (Q) by the laboratory. However, this result was already qualified and no further action was required.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	NBKK-OU2A2-MW08P-1222 ng/L	NBKK-OU2A2-MW08-1222 ng/L	RPD	Qualifier
PFHxA	21.1	18.3	14%	None
PFHpA	8.98	10.8	18%	
PFOA	330	358	8%	
PFNA	7.85	5.69	32%	None - <5X LOQ
PFHxS	157	133	17%	None
PFOS	470	424	10%	

Compound	NBKK-OU2A2-MW03P-1222 ng/L	NBKK-OU2A2-MW03-1222 ng/L	RPD	Qualifier
None	ND	ND	-	-

Compound	NBKK-B1006-MW04-1222 ng/L	NBKK-B1006-MW04P-1222 ng/L	RPD	Qualifier
PFHxA	6.19	4.96	22%	None
PFOA	3.32	2.59	25%	
PFOS	21.3	18.4	15%	

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 5/22/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID		NBKK-OU2A2-MW06-1222						
Battelle ID		D0830-FS						
Sample Type		SA						
Collection Date		12/08/2022						
Extraction Date		12/20/2022						
Analytical Instrument		Sciex 6500 (AD) LC/MS/MS						
%Moisture		NA						
Matrix		AQ						
Sample Size		0.261						
Size Unit-Basis		L						
Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	3.52 J	D0830-FS(0)	1.000	1/4/2023	0.875	2.39	4.79
PFHpA	375-85-9	2.39 U	D0830-FS(0)	1.000	1/4/2023	0.901	2.39	4.79
PFOA	335-67-1	35.4	D0830-FS(0)	1.000	1/4/2023	0.967	2.39	4.79
PFNA	375-95-1	2.39 U	D0830-FS(0)	1.000	1/4/2023	0.798	2.39	4.79
PFDA	335-76-2	2.39 U	D0830-FS(0)	1.000	1/4/2023	0.751	2.39	4.79
PFUnA	2058-94-8	2.39 U	D0830-FS(0)	1.000	1/4/2023	0.720	2.39	4.79
PFDoA	307-55-1	2.39 U	D0830-FS(0)	1.000	1/4/2023	0.728	2.39	4.79
PFTrDA	72629-94-8	2.39 U	D0830-FS(0)	1.000	1/4/2023	0.711	2.39	4.79
PFTeDA	376-06-7	2.39 U	D0830-FS(0)	1.000	1/4/2023	0.758	2.39	4.79
NMeFOSAA	2355-31-9	2.39 U	D0830-FS(0)	1.000	1/4/2023	0.987	2.39	4.79
NEtFOSAA	2991-50-6	2.39 U	D0830-FS(0)	1.000	1/4/2023	0.948	2.39	4.79
PFBS	375-73-5	2.39 U	D0830-FS(0)	1.000	1/4/2023	0.830	2.39	4.79
PFHxS	355-46-4	136	D0830-FS(0)	1.000	1/4/2023	0.955	2.39	4.79
PFOS	1763-23-1	123	D0830-FS(0)	1.000	1/4/2023	1.02	2.39	4.79
HFPO-DA	13252-13-6	2.39 U	D0830-FS(0)	1.000	1/4/2023	0.829	2.39	4.79
Adona	919005-14-4	2.39 U	D0830-FS(0)	1.000	1/4/2023	0.832	2.39	4.79
9Cl-PF3ONS	756426-58-1	2.39 U	D0830-FS(0)	1.000	1/4/2023	0.987	2.39	4.79
11Cl-PF3OUdS	763051-92-9	2.39 U	D0830-FS(0)	1.000	1/4/2023	0.863	2.39	4.79

MW 5/12/23

Analyzed by: Burkitt, Nathan
Printed: 2/15/2023

2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID		NBKK-OU2A2-MW02-1222						
Battelle ID		D0831-FS						
Sample Type		SA						
Collection Date		12/08/2022						
Extraction Date		12/20/2022						
Analytical Instrument		Sciex 6500 (AD) LC/MS/MS						
%Moisture		NA						
Matrix		AQ						
Sample Size		0.270						
Size Unit-Basis		L						
Analyte	CASNo.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	4.57 J	D0831-FS(0)	1.000	1/4/2023	0.845	2.31	4.63
PFHpA	375-85-9	2.31 U	D0831-FS(0)	1.000	1/4/2023	0.871	2.31	4.63
PFOA	335-67-1	4.09 J	D0831-FS(0)	1.000	1/4/2023	0.935	2.31	4.63
PFNA	375-95-1	2.31 U	D0831-FS(0)	1.000	1/4/2023	0.771	2.31	4.63
PFDA	335-76-2	2.31 U	D0831-FS(0)	1.000	1/4/2023	0.726	2.31	4.63
PFUnA	2058-94-8	2.31 U	D0831-FS(0)	1.000	1/4/2023	0.696	2.31	4.63
PFDoA	307-55-1	2.31 U	D0831-FS(0)	1.000	1/4/2023	0.704	2.31	4.63
PFTrDA	72629-94-8	2.31 U	D0831-FS(0)	1.000	1/4/2023	0.687	2.31	4.63
PFTeDA	376-06-7	2.31 U	D0831-FS(0)	1.000	1/4/2023	0.732	2.31	4.63
NMeFOSAA	2355-31-9	2.31 U	D0831-FS(0)	1.000	1/4/2023	0.954	2.31	4.63
NEtFOSAA	2991-50-6	2.31 U	D0831-FS(0)	1.000	1/4/2023	0.917	2.31	4.63
PFBS	375-73-5	2.31 U	D0831-FS(0)	1.000	1/4/2023	0.802	2.31	4.63
PFHxS	355-46-4	2.31 U	D0831-FS(0)	1.000	1/4/2023	0.923	2.31	4.63
PFOS	1763-23-1	2.31 U	D0831-FS(0)	1.000	1/4/2023	0.991	2.31	4.63
HFPO-DA	13252-13-6	2.31 U	D0831-FS(0)	1.000	1/4/2023	0.801	2.31	4.63
Adona	919005-14-4	2.31 U	D0831-FS(0)	1.000	1/4/2023	0.805	2.31	4.63
9Cl-PF3ONS	756426-58-1	2.31 U	D0831-FS(0)	1.000	1/4/2023	0.954	2.31	4.63
11Cl-PF3OUdS	763051-92-9	2.31 U	D0831-FS(0)	1.000	1/4/2023	0.834	2.31	4.63

MW 5/24/23

Analyzed by: Burkitt, Nathan
Printed: 2/15/2023

3

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-MW2-8-1222
Battelle ID	D0832-FS
Sample Type	SA
Collection Date	12/08/2022
Extraction Date	12/20/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
%Moisture	NA
Matrix	AQ
Sample Size	0.249
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)		Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	18.3	J	D0832-FS(0)	1.000	1/4/2023	0.917	2.51	5.02	ISL
PFHpA	375-85-9	10.8		D0832-FS(0)	1.000	1/4/2023	0.945	2.51	5.02	
PFOA	335-67-1	358		D0832-FS(0)	1.000	1/4/2023	1.01	2.51	5.02	
PFNA	375-95-1	5.69	Q	D0832-FS(0)	1.000	1/4/2023	0.836	2.51	5.02	
PFDA	335-76-2	2.51	U	D0832-FS(0)	1.000	1/4/2023	0.787	2.51	5.02	
PFUnA	2058-94-8	2.51	U	D0832-FS(0)	1.000	1/4/2023	0.755	2.51	5.02	
PFDoA	307-55-1	2.51	U	D0832-FS(0)	1.000	1/4/2023	0.763	2.51	5.02	
PFTrDA	72629-94-8	2.51	U	D0832-FS(0)	1.000	1/4/2023	0.745	2.51	5.02	
PFTeDA	376-06-7	2.51	U	D0832-FS(0)	1.000	1/4/2023	0.794	2.51	5.02	
NMeFOSAA	2355-31-9	2.51	U	D0832-FS(0)	1.000	1/4/2023	1.03	2.51	5.02	
NEtFOSAA	2991-50-6	2.51	U	D0832-FS(0)	1.000	1/4/2023	0.994	2.51	5.02	
PFBS	375-73-5	2.51	U	D0832-FS(0)	1.000	1/4/2023	0.869	2.51	5.02	
PFHxS	355-46-4	133		D0832-FS(0)	1.000	1/4/2023	1.00	2.51	5.02	
PFOS	1763-23-1	424		D0832-FS(0)	1.000	1/4/2023	1.07	2.51	5.02	
HFPO-DA	13252-13-6	2.51	U	D0832-FS(0)	1.000	1/4/2023	0.868	2.51	5.02	ISL
Adona	919005-14-4	2.51	U	D0832-FS(0)	1.000	1/4/2023	0.872	2.51	5.02	
9Cl-PF3ONS	756426-58-1	2.51	U	D0832-FS(0)	1.000	1/4/2023	1.03	2.51	5.02	
11Cl-PF3OUdS	763051-92-9	2.51	U	D0832-FS(0)	1.000	1/4/2023	0.905	2.51	5.02	

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID		NBKK-OU2A2-MW2-8P-1222							
Battelle ID		D0833-FS							
Sample Type		SA							
Collection Date		12/08/2022							
Extraction Date		12/20/2022							
Analytical Instrument		Sciex 6500 (AD) LC/MS/MS							
%Moisture		NA							
Matrix		AQ							
Sample Size		0.265							
Size Unit-Basis		L							
Analyte	CASNo.	Result (ng/L)		Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	21.1	J	D0833-FS(0)	1.000	1/4/2023	0.861	2.36	4.72
PFHpA	375-85-9	8.98		D0833-FS(0)	1.000	1/4/2023	0.888	2.36	4.72
PFOA	335-67-1	330		D0833-FS(0)	1.000	1/4/2023	0.953	2.36	4.72
PFNA	375-95-1	7.85		D0833-FS(0)	1.000	1/4/2023	0.786	2.36	4.72
PFDA	335-76-2	2.36 U		D0833-FS(0)	1.000	1/4/2023	0.740	2.36	4.72
PFUnA	2058-94-8	2.36 U		D0833-FS(0)	1.000	1/4/2023	0.709	2.36	4.72
PFDoA	307-55-1	2.36 U		D0833-FS(0)	1.000	1/4/2023	0.717	2.36	4.72
PFTrDA	72629-94-8	2.36 U		D0833-FS(0)	1.000	1/4/2023	0.700	2.36	4.72
PFTeDA	376-06-7	2.36 U		D0833-FS(0)	1.000	1/4/2023	0.746	2.36	4.72
NMeFOSAA	2355-31-9	2.36 U		D0833-FS(0)	1.000	1/4/2023	0.972	2.36	4.72
NEtFOSAA	2991-50-6	2.36 U		D0833-FS(0)	1.000	1/4/2023	0.934	2.36	4.72
PFBS	375-73-5	2.36 U		D0833-FS(0)	1.000	1/4/2023	0.817	2.36	4.72
PFHxS	355-46-4	157		D0833-FS(0)	1.000	1/4/2023	0.941	2.36	4.72
PFOS	1763-23-1	470		D0833-FS(0)	1.000	1/4/2023	1.01	2.36	4.72
HFPO-DA	13252-13-6	2.36 U	UJ	D0833-FS(0)	1.000	1/4/2023	0.816	2.36	4.72
Adona	919005-14-4	2.36 U		D0833-FS(0)	1.000	1/4/2023	0.820	2.36	4.72
9Cl-PF3ONS	756426-58-1	2.36 U		D0833-FS(0)	1.000	1/4/2023	0.972	2.36	4.72
11Cl-PF3OUdS	763051-92-9	2.36 U		D0833-FS(0)	1.000	1/4/2023	0.850	2.36	4.72

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MW 5/24/23

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-MW03P-1222
Battelle ID	D0835-FS
Sample Type	SA
Collection Date	12/08/2022
Extraction Date	12/20/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
%Moisture	NA
Matrix	AQ
Sample Size	0.270
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	4.21 J	D0835-FS(0)	1.000	1/4/2023	0.845	2.31	4.63
PFHpA	375-85-9	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.871	2.31	4.63
PFOA	335-67-1	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.935	2.31	4.63
PFNA	375-95-1	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.771	2.31	4.63
PFDA	335-76-2	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.726	2.31	4.63
PFUnA	2058-94-8	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.696	2.31	4.63
PFDoA	307-55-1	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.704	2.31	4.63
PFTrDA	72629-94-8	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.687	2.31	4.63
PFTeDA	376-06-7	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.732	2.31	4.63
NMeFOSAA	2355-31-9	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.954	2.31	4.63
NEtFOSAA	2991-50-6	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.917	2.31	4.63
PFBS	375-73-5	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.802	2.31	4.63
PFHxS	355-46-4	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.923	2.31	4.63
PFOS	1763-23-1	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.991	2.31	4.63
HFPO-DA	13252-13-6	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.801	2.31	4.63
Adona	919005-14-4	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.805	2.31	4.63
9Cl-PF3ONS	756426-58-1	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.954	2.31	4.63
11Cl-PF3OUdS	763051-92-9	2.31 U	D0835-FS(0)	1.000	1/4/2023	0.834	2.31	4.63

MW 5/21/23

Analyzed by: Burkitt, Nathan
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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID		NBKK-OU2A2-MW03-1222						
Battelle ID		D0836-FS						
Sample Type		SA						
Collection Date		12/08/2022						
Extraction Date		12/20/2022						
Analytical Instrument		Sciex 6500 (AD) LC/MS/MS						
%Moisture		NA						
Matrix		AQ						
Sample Size		0.264						
Size Unit-Basis		L						
Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	1.95 J	D0836-FS(0)	1.000	1/4/2023	0.865	2.37	4.73
PFHpA	375-85-9	2.37 U	D0836-FS(0)	1.000	1/4/2023	0.891	2.37	4.73
PFOA	335-67-1	2.37 U	D0836-FS(0)	1.000	1/4/2023	0.956	2.37	4.73
PFNA	375-95-1	2.37 U	D0836-FS(0)	1.000	1/4/2023	0.789	2.37	4.73
PFDA	335-76-2	2.37 U	D0836-FS(0)	1.000	1/4/2023	0.742	2.37	4.73
PFUnA	2058-94-8	2.37 U	D0836-FS(0)	1.000	1/4/2023	0.712	2.37	4.73
PFDoA	307-55-1	2.37 U	D0836-FS(0)	1.000	1/4/2023	0.720	2.37	4.73
PFTrDA	72629-94-8	2.37 U UJ	D0836-FS(0)	1.000	1/4/2023	0.703	2.37	4.73 SSL
PFTeDA	376-06-7	2.37 U UJ	D0836-FS(0)	1.000	1/4/2023	0.749	2.37	4.73 SSL
NMeFOSAA	2355-31-9	2.37 U	D0836-FS(0)	1.000	1/4/2023	0.975	2.37	4.73
NEtFOSAA	2991-50-6	2.37 U	D0836-FS(0)	1.000	1/4/2023	0.938	2.37	4.73
PFBS	375-73-5	2.37 U	D0836-FS(0)	1.000	1/4/2023	0.820	2.37	4.73
PFHxS	355-46-4	2.37 U	D0836-FS(0)	1.000	1/4/2023	0.944	2.37	4.73
PFOS	1763-23-1	2.37 U	D0836-FS(0)	1.000	1/4/2023	1.01	2.37	4.73
HFPO-DA	13252-13-6	2.37 U	D0836-FS(0)	1.000	1/4/2023	0.819	2.37	4.73
Adona	919005-14-4	2.37 U	D0836-FS(0)	1.000	1/4/2023	0.823	2.37	4.73
9Cl-PF3ONS	756426-58-1	2.37 U	D0836-FS(0)	1.000	1/4/2023	0.975	2.37	4.73
11Cl-PF3OUdS	763051-92-9	2.37 U	D0836-FS(0)	1.000	1/4/2023	0.853	2.37	4.73

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Analyzed by: Burkitt, Nathan
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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID		NBKK-CF1-MW01-1222							
Battelle ID		D0837-FS							
Sample Type		SA							
Collection Date		12/07/2022							
Extraction Date		12/20/2022							
Analytical Instrument		Sciex 6500 (AD) LC/MS/MS							
%Moisture		NA							
Matrix		AQ							
Sample Size		0.260							
Size Unit-Basis		L							
Analyte	CAS No.	Result (ng/L)		Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	5.25 Q	J	D0837-FS(0)	1.000	1/4/2023	0.878	2.40	4.81	OT
PFHpA	375-85-9	2.40 U		D0837-FS(0)	1.000	1/4/2023	0.905	2.40	4.81	
PFOA	335-67-1	2.40 U		D0837-FS(0)	1.000	1/4/2023	0.971	2.40	4.81	
PFNA	375-95-1	2.40 U		D0837-FS(0)	1.000	1/4/2023	0.801	2.40	4.81	
PFDA	335-76-2	2.40 U		D0837-FS(0)	1.000	1/4/2023	0.754	2.40	4.81	
PFUnA	2058-94-8	2.40 U		D0837-FS(0)	1.000	1/4/2023	0.723	2.40	4.81	
PFDoA	307-55-1	2.40 U		D0837-FS(0)	1.000	1/4/2023	0.731	2.40	4.81	
PFTrDA	72629-94-8	2.40 U	UJ	D0837-FS(0)	1.000	1/4/2023	0.713	2.40	4.81	SSL
PFTeDA	376-06-7	2.40 U	UJ	D0837-FS(0)	1.000	1/4/2023	0.761	2.40	4.81	SSL
NMeFOSAA	2355-31-9	2.40 U		D0837-FS(0)	1.000	1/4/2023	0.990	2.40	4.81	
NEtFOSAA	2991-50-6	2.40 U		D0837-FS(0)	1.000	1/4/2023	0.952	2.40	4.81	
PFBS	375-73-5	2.40 U		D0837-FS(0)	1.000	1/4/2023	0.833	2.40	4.81	
PFHxS	355-46-4	2.40 U		D0837-FS(0)	1.000	1/4/2023	0.959	2.40	4.81	
PFOS	1763-23-1	7.85		D0837-FS(0)	1.000	1/4/2023	1.03	2.40	4.81	
HFPO-DA	13252-13-6	2.40 U		D0837-FS(0)	1.000	1/4/2023	0.832	2.40	4.81	
Adona	919005-14-4	2.40 U		D0837-FS(0)	1.000	1/4/2023	0.836	2.40	4.81	
9Cl-PF3ONS	756426-58-1	2.40 U		D0837-FS(0)	1.000	1/4/2023	0.990	2.40	4.81	
11Cl-PF3OUdS	763051-92-9	2.40 U		D0837-FS(0)	1.000	1/4/2023	0.866	2.40	4.81	

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID		NBKK-OU2A5-MW02-1222						
Battelle ID		D0838-FS						
Sample Type		SA						
Collection Date		12/07/2022						
Extraction Date		12/20/2022						
Analytical Instrument		Sciex 6500 (AD) LC/MS/MS						
%Moisture		NA						
Matrix		AQ						
Sample Size		0.258						
Size Unit-Basis		L						
Analyte	CASNo.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.885	2.42	4.84
PFHpA	375-85-9	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.912	2.42	4.84
PFOA	335-67-1	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.979	2.42	4.84
PFNA	375-95-1	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.807	2.42	4.84
PFDA	335-76-2	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.760	2.42	4.84
PFUnA	2058-94-8	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.729	2.42	4.84
PFDoA	307-55-1	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.736	2.42	4.84
PFTrDA	72629-94-8	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.719	2.42	4.84
PFTeDA	376-06-7	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.766	2.42	4.84
NMeFOSAA	2355-31-9	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.998	2.42	4.84
NEtFOSAA	2991-50-6	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.959	2.42	4.84
PFBS	375-73-5	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.839	2.42	4.84
PFHxS	355-46-4	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.966	2.42	4.84
PFOS	1763-23-1	2.42 U	D0838-FS(0)	1.000	1/4/2023	1.04	2.42	4.84
HFPO-DA	13252-13-6	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.838	2.42	4.84
Adona	919005-14-4	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.842	2.42	4.84
9Cl-PF3ONS	756426-58-1	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.998	2.42	4.84
11Cl-PF3OUdS	763051-92-9	2.42 U	D0838-FS(0)	1.000	1/4/2023	0.873	2.42	4.84

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Analyzed by: Burkitt, Nathan
Printed: 2/15/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B1006-MW04-1222
Battelle ID	D0839-FS
Sample Type	SA
Collection Date	12/08/2022
Extraction Date	12/20/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
%Moisture	NA
Matrix	AQ
Sample Size	0.268
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	6.19 J	D0839-FS(0)	1.000	1/4/2023	0.852	2.33	4.66
PFHpA	375-85-9	2.33 U	D0839-FS(0)	1.000	1/4/2023	0.878	2.33	4.66
PFOA	335-67-1	3.32 J	D0839-FS(0)	1.000	1/4/2023	0.942	2.33	4.66
PFNA	375-95-1	2.33 U	D0839-FS(0)	1.000	1/4/2023	0.777	2.33	4.66
PFDA	335-76-2	2.33 U	D0839-FS(0)	1.000	1/4/2023	0.731	2.33	4.66
PFUnA	2058-94-8	2.33 U	D0839-FS(0)	1.000	1/4/2023	0.701	2.33	4.66
PFDoA	307-55-1	2.33 U	D0839-FS(0)	1.000	1/4/2023	0.709	2.33	4.66
PFTrDA	72629-94-8	2.33 U	D0839-FS(0)	1.000	1/4/2023	0.692	2.33	4.66
PFTeDA	376-06-7	2.33 U	D0839-FS(0)	1.000	1/4/2023	0.738	2.33	4.66
NMeFOSAA	2355-31-9	2.33 U	D0839-FS(0)	1.000	1/4/2023	0.961	2.33	4.66
NEtFOSAA	2991-50-6	2.33 U	D0839-FS(0)	1.000	1/4/2023	0.924	2.33	4.66
PFBS	375-73-5	2.33 U	D0839-FS(0)	1.000	1/4/2023	0.808	2.33	4.66
PFHxS	355-46-4	2.33 U	D0839-FS(0)	1.000	1/4/2023	0.930	2.33	4.66
PFOS	1763-23-1	21.3	D0839-FS(0)	1.000	1/4/2023	0.998	2.33	4.66
HFPO-DA	13252-13-6	2.33 U	D0839-FS(0)	1.000	1/4/2023	0.807	2.33	4.66
Adona	919005-14-4	2.33 U	D0839-FS(0)	1.000	1/4/2023	0.811	2.33	4.66
9Cl-PF3ONS	756426-58-1	2.33 U	D0839-FS(0)	1.000	1/4/2023	0.961	2.33	4.66
11Cl-PF3OUdS	763051-92-9	2.33 U	D0839-FS(0)	1.000	1/4/2023	0.840	2.33	4.66

NW 5/21/23

Analyzed by: Burkitt, Nathan
Printed: 2/15/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID		NBKK-B1006-MW04P-1222						
Battelle ID		D0840-FS						
Sample Type		SA						
Collection Date		12/08/2022						
Extraction Date		12/20/2022						
Analytical Instrument		Sciex 6500 (AD) LC/MS/MS						
%Moisture		NA						
Matrix		AQ						
Sample Size		0.273						
Size Unit-Basis		L						
Analyte	CASNo.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	4.96	D0840-FS(0)	1.000	1/4/2023	0.836	2.29	4.58
PFHpA	375-85-9	2.29 U	D0840-FS(0)	1.000	1/4/2023	0.862	2.29	4.58
PFOA	335-67-1	2.59 J	D0840-FS(0)	1.000	1/4/2023	0.925	2.29	4.58
PFNA	375-95-1	2.29 U	D0840-FS(0)	1.000	1/4/2023	0.763	2.29	4.58
PFDA	335-76-2	2.29 U	D0840-FS(0)	1.000	1/4/2023	0.718	2.29	4.58
PFUnA	2058-94-8	2.29 U	D0840-FS(0)	1.000	1/4/2023	0.689	2.29	4.58
PFDoA	307-55-1	2.29 U	D0840-FS(0)	1.000	1/4/2023	0.696	2.29	4.58
PFTrDA	72629-94-8	2.29 U	D0840-FS(0)	1.000	1/4/2023	0.679	2.29	4.58
PFTeDA	376-06-7	2.29 U	D0840-FS(0)	1.000	1/4/2023	0.724	2.29	4.58
NMeFOSAA	2355-31-9	2.29 U	D0840-FS(0)	1.000	1/4/2023	0.943	2.29	4.58
NEtFOSAA	2991-50-6	2.29 U	D0840-FS(0)	1.000	1/4/2023	0.907	2.29	4.58
PFBS	375-73-5	2.29 U	D0840-FS(0)	1.000	1/4/2023	0.793	2.29	4.58
PFHxS	355-46-4	2.29 U	D0840-FS(0)	1.000	1/4/2023	0.913	2.29	4.58
PFOS	1763-23-1	18.4	D0840-FS(0)	1.000	1/4/2023	0.980	2.29	4.58
HFPO-DA	13252-13-6	2.29 U	D0840-FS(0)	1.000	1/4/2023	0.792	2.29	4.58
Adona	919005-14-4	2.29 U	D0840-FS(0)	1.000	1/4/2023	0.796	2.29	4.58
9Cl-PF3ONS	756426-58-1	2.29 U	D0840-FS(0)	1.000	1/4/2023	0.943	2.29	4.58
11Cl-PF3OUdS	763051-92-9	2.29 U	D0840-FS(0)	1.000	1/4/2023	0.825	2.29	4.58

MS 5/21/23

Analyzed by: Burkitt, Nathan
Printed: 2/15/2023

11

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID		NBKK-OU2A2-MW05-1222						
Battelle ID		D0841-FS						
Sample Type		SA						
Collection Date		12/08/2022						
Extraction Date		12/20/2022						
Analytical Instrument		Sciex 6500 (AD) LC/MS/MS						
%Moisture		NA						
Matrix		AQ						
Sample Size		0.262						
Size Unit-Basis		L						
Analyte	CASNo.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	18.5	D0841-FS(0)	1.000	1/4/2023	0.871	2.39	4.77
PFHpA	375-85-9	13.6	D0841-FS(0)	1.000	1/4/2023	0.898	2.39	4.77
PFOA	335-67-1	138	D0841-FS(0)	1.000	1/4/2023	0.964	2.39	4.77
PFNA	375-95-1	2.39 U	D0841-FS(0)	1.000	1/4/2023	0.795	2.39	4.77
PFDA	335-76-2	2.39 U	D0841-FS(0)	1.000	1/4/2023	0.748	2.39	4.77
PFUnA	2058-94-8	2.39 U	D0841-FS(0)	1.000	1/4/2023	0.718	2.39	4.77
PFDoA	307-55-1	2.39 U	D0841-FS(0)	1.000	1/4/2023	0.725	2.39	4.77
PFTrDA	72629-94-8	2.39 U UJ	D0841-FS(0)	1.000	1/4/2023	0.708	2.39	4.77 SSL
PFTeDA	376-06-7	2.39 U UJ	D0841-FS(0)	1.000	1/4/2023	0.755	2.39	4.77 SSL
NMeFOSAA	2355-31-9	2.39 U	D0841-FS(0)	1.000	1/4/2023	0.983	2.39	4.77
NEtFOSAA	2991-50-6	2.39 U	D0841-FS(0)	1.000	1/4/2023	0.945	2.39	4.77
PFBS	375-73-5	2.39 U	D0841-FS(0)	1.000	1/4/2023	0.826	2.39	4.77
PFHxS	355-46-4	53.3	D0841-FS(0)	1.000	1/4/2023	0.951	2.39	4.77
PFOS	1763-23-1	75.8	D0841-FS(0)	1.000	1/4/2023	1.02	2.39	4.77
HFPO-DA	13252-13-6	2.39 U	D0841-FS(0)	1.000	1/4/2023	0.825	2.39	4.77
Adona	919005-14-4	2.39 U	D0841-FS(0)	1.000	1/4/2023	0.829	2.39	4.77
9Cl-PF3ONS	756426-58-1	2.39 U	D0841-FS(0)	1.000	1/4/2023	0.983	2.39	4.77
11Cl-PF3OUdS	763051-92-9	2.39 U	D0841-FS(0)	1.000	1/4/2023	0.860	2.39	4.77

MW 5/21/23

Analyzed by: Burkitt, Nathan
Printed: 2/15/2023

12

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID		NBKK-OU2A2-MW04-1222						
Battelle ID		D0842-FS						
Sample Type		SA						
Collection Date		12/08/2022						
Extraction Date		12/20/2022						
Analytical Instrument		Sciex 6500 (AD) LC/MS/MS						
%Moisture		NA						
Matrix		AQ						
Sample Size		0.257						
Size Unit-Basis		L						
Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	19.2	D0842-FS(0)	1.000	1/4/2023	0.888	2.43	4.86	
PFHpA	375-85-9	9.52	D0842-FS(0)	1.000	1/4/2023	0.915	2.43	4.86	
PFOA	335-67-1	15.6	D0842-FS(0)	1.000	1/4/2023	0.982	2.43	4.86	
PFNA	375-95-1	2.43 U	D0842-FS(0)	1.000	1/4/2023	0.810	2.43	4.86	
PFDA	335-76-2	2.43 U	D0842-FS(0)	1.000	1/4/2023	0.763	2.43	4.86	
PFUnA	2058-94-8	2.43 U	D0842-FS(0)	1.000	1/4/2023	0.732	2.43	4.86	
PFDoA	307-55-1	2.43 U	D0842-FS(0)	1.000	1/4/2023	0.739	2.43	4.86	
PFTrDA	72629-94-8	2.43 U UJ	D0842-FS(0)	1.000	1/4/2023	0.722	2.43	4.86	SSL
PFTeDA	376-06-7	2.43 U UJ	D0842-FS(0)	1.000	1/4/2023	0.769	2.43	4.86	SSL
NMeFOSAA	2355-31-9	2.43 U	D0842-FS(0)	1.000	1/4/2023	1.00	2.43	4.86	
NEtFOSAA	2991-50-6	2.43 U	D0842-FS(0)	1.000	1/4/2023	0.963	2.43	4.86	
PFBS	375-73-5	2.43 U	D0842-FS(0)	1.000	1/4/2023	0.842	2.43	4.86	
PFHxS	355-46-4	88.2	D0842-FS(0)	1.000	1/4/2023	0.970	2.43	4.86	
PFOS	1763-23-1	29.5	D0842-FS(0)	1.000	1/4/2023	1.04	2.43	4.86	
HFPO-DA	13252-13-6	2.43 U	D0842-FS(0)	1.000	1/4/2023	0.841	2.43	4.86	
Adona	919005-14-4	2.43 U	D0842-FS(0)	1.000	1/4/2023	0.845	2.43	4.86	
9Cl-PF3ONS	756426-58-1	2.43 U	D0842-FS(0)	1.000	1/4/2023	1.00	2.43	4.86	
11Cl-PF3OUdS	763051-92-9	2.43 U	D0842-FS(0)	1.000	1/4/2023	0.876	2.43	4.86	

MW 5/21/23

Analyzed by: Burkitt, Nathan
Printed: 2/15/2023

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 23-0654
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: July 2, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-OU2A2-MW01-0623	D5396-FS	Water
2	NBKK-OU2A2-EB01-060123-GW	D5397-FS	Water
3	NBKK-OU2A2-FB01-060123	D5398-FS	Water

A Stage 2B/4 data validation was performed on the analytical data for one water sample, one aqueous equipment blank sample, and one aqueous field blank sample collected on June 1, 2023 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, 3, and 4 Revised Table for Sample Qualification in the Presence of Blank Contamination, February 2022;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample results are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-OU2A2-EB01-060123-GW	None - ND	-	-	-
NBKK-OU2A2-FB01-060123	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R) except for the following.

EDS Sample	Surrogate	%R	Qualifier
1	13C2-PFTeDA	43%	UJ - Associated Cmpds

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

- The LCS/LCSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 7/3/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-MW01-0623
Battelle ID	D5396-FS
Sample Type	SA
Collection Date	06/01/2023
Extraction Date	06/05/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.246
Size Unit Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	2.98 J	D5396-FS(0)	1.000	6/6/2023	0.928	2.54	5.08	
PFHpA	375-85-9	1.54 J	D5396-FS(0)	1.000	6/6/2023	0.956	2.54	5.08	
PFOA	335-67-1	7.08	D5396-FS(0)	1.000	6/6/2023	1.03	2.54	5.08	
PFNA	375-95-1	1.02 J	D5396-FS(0)	1.000	6/6/2023	0.847	2.54	5.08	
PFDA	335-76-2	2.54 U	D5396-FS(0)	1.000	6/6/2023	0.797	2.54	5.08	
PFUnA	2058-94-8	2.54 U	D5396-FS(0)	1.000	6/6/2023	0.764	2.54	5.08	
PFDoA	307-55-1	2.54 U	D5396-FS(0)	1.000	6/6/2023	0.772	2.54	5.08	
PFTrDA	72629-94-8	2.54 U UJ	D5396-FS(0)	1.000	6/6/2023	0.754	2.54	5.08	SSL
PFTeDA	376-06-7	2.54 U UJ	D5396-FS(0)	1.000	6/6/2023	0.804	2.54	5.08	SSL
NMeFOSAA	2355-31-9	2.54 U	D5396-FS(0)	1.000	6/6/2023	1.05	2.54	5.08	
NEtFOSAA	2991-50-6	2.54 U	D5396-FS(0)	1.000	6/6/2023	1.01	2.54	5.08	
PFBS	375-73-5	1.11 J	D5396-FS(0)	1.000	6/6/2023	0.880	2.54	5.08	
PFHxS	355-46-4	22.8	D5396-FS(0)	1.000	6/6/2023	1.01	2.54	5.08	
PFOS	1763-23-1	2.54 U	D5396-FS(0)	1.000	6/6/2023	1.09	2.54	5.08	
HFPO-DA	13252-13-6	2.54 U	D5396-FS(0)	1.000	6/6/2023	0.879	2.54	5.08	
Adona	919005-14-4	2.54 U	D5396-FS(0)	1.000	6/6/2023	0.883	2.54	5.08	
9Cl-PF3ONS	756426-58-1	2.54 U	D5396-FS(0)	1.000	6/6/2023	1.05	2.54	5.08	
11Cl-PF3OUdS	763051-92-9	2.54 U	D5396-FS(0)	1.000	6/6/2023	0.916	2.54	5.08	

NW 7/2/23

Analyzed by: Harnden, Kelsey
Printed: 6/14/2023

BATTELLE
It can be done

2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-EB01-060123-GW
Battelle ID	D5397-FS
Sample Type	SA
Collection Date	06/01/2023
Extraction Date	06/05/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.269
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.849	2.32	4.65
PFHpA	375-85-9	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.875	2.32	4.65
PFOA	335-67-1	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.939	2.32	4.65
PFNA	375-95-1	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.774	2.32	4.65
PFDA	335-76-2	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.729	2.32	4.65
PFUnA	2058-94-8	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.699	2.32	4.65
PFDoA	307-55-1	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.706	2.32	4.65
PFTrDA	72629-94-8	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.690	2.32	4.65
PFTeDA	376-06-7	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.735	2.32	4.65
NMeFOSAA	2355-31-9	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.957	2.32	4.65
NEtFOSAA	2991-50-6	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.920	2.32	4.65
PFBS	375-73-5	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.805	2.32	4.65
PFHxS	355-46-4	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.927	2.32	4.65
PFOS	1763-23-1	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.994	2.32	4.65
HFPO-DA	13252-13-6	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.804	2.32	4.65
Adona	919005-14-4	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.808	2.32	4.65
9Cl-PF3ONS	756426-58-1	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.957	2.32	4.65
11Cl-PF3OUdS	763051-92-9	2.32 U	D5397-FS(0)	1.000	6/7/2023	0.837	2.32	4.65

MW 7/12/23

Analyzed by: Harnden, Kelsey
Printed: 6/14/2023

BATTELLE
It can be done

3

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-OU2A2-FB01-060123
Battelle ID	D5398-F5
Sample Type	SA
Collection Date	06/01/2023
Extraction Date	06/05/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	AQ
Sample Size	0.240
Size Unit Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.60 U	D5398-FS(0)	1.000	6/7/2023	0.951	2.60	5.21
PFHpA	375-85-9	2.60 U	D5398-FS(0)	1.000	6/7/2023	0.980	2.60	5.21
PFOA	335-67-1	2.60 U	D5398-FS(0)	1.000	6/7/2023	1.05	2.60	5.21
PFNA	375-95-1	2.60 U	D5398-FS(0)	1.000	6/7/2023	0.868	2.60	5.21
PFDA	335-76-2	2.60 U	D5398-FS(0)	1.000	6/7/2023	0.817	2.60	5.21
PFUnA	2058-94-8	2.60 U	D5398-FS(0)	1.000	6/7/2023	0.783	2.60	5.21
PFDoA	307-55-1	2.60 U	D5398-FS(0)	1.000	6/7/2023	0.792	2.60	5.21
PFTrDA	72629-94-8	2.60 U	D5398-FS(0)	1.000	6/7/2023	0.773	2.60	5.21
PFTeDA	376-06-7	2.60 U	D5398-FS(0)	1.000	6/7/2023	0.824	2.60	5.21
NMeFOSAA	2355-31-9	2.60 U	D5398-FS(0)	1.000	6/7/2023	1.07	2.60	5.21
NEtFOSAA	2991-50-6	2.60 U	D5398-FS(0)	1.000	6/7/2023	1.03	2.60	5.21
PFBS	375-73-5	2.60 U	D5398-FS(0)	1.000	6/7/2023	0.902	2.60	5.21
PFHxS	355-46-4	2.60 U	D5398-FS(0)	1.000	6/7/2023	1.04	2.60	5.21
PFOS	1763-23-1	2.60 U	D5398-FS(0)	1.000	6/7/2023	1.11	2.60	5.21
HFPO-DA	13252-13-6	2.60 U	D5398-FS(0)	1.000	6/7/2023	0.901	2.60	5.21
Adona	919005-14-4	2.60 U	D5398-FS(0)	1.000	6/7/2023	0.905	2.60	5.21
9Cl-PF3ONS	756426-58-1	2.60 U	D5398-FS(0)	1.000	6/7/2023	1.07	2.60	5.21
11Cl-PF3OUdS	763051-92-9	2.60 U	D5398-FS(0)	1.000	6/7/2023	0.939	2.60	5.21

NW 7/12/23

Analyzed by: Harnden, Kelsey
Printed: 6/14/2023

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 23-0997
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: September 10, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-EB01-080823	D7463-FS	Water
2	NBKK-EB01-080923	D7464-FS	Water
3	NBKK-EB02-080923	D7478-FS	Water

A Stage 2B/4 data validation was performed on the analytical data for three aqueous equipment blank samples collected on August 8-9, 2023 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, 3, and 4 Revised Table for Sample Qualification in the Presence of Blank Contamination, February 2022;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample results are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-EB01-080823	PFHxA	0.969	None	Applies to other Packages
NBKK-EB01-080923	None - ND	-	-	-
NBKK-EB02-080923	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Control Sample (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 9/11/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-EB01-080823
Battelle ID	D7463-FS
Sample Type	SA
Collection Date	08/08/2023
Extraction Date	08/17/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.260
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.969 J	D7463-FS(0)	1.000	8/19/2023	0.878	2.40	4.81
PFHpA	375-85-9	2.40 U	D7463-FS(0)	1.000	8/19/2023	0.905	2.40	4.81
PFOA	335-67-1	2.40 U	D7463-FS(0)	1.000	8/19/2023	0.971	2.40	4.81
PFNA	375-95-1	2.40 U	D7463-FS(0)	1.000	8/19/2023	0.801	2.40	4.81
PFDA	335-76-2	2.40 U	D7463-FS(0)	1.000	8/19/2023	0.754	2.40	4.81
PFUnA	2058-94-8	2.40 U	D7463-FS(0)	1.000	8/19/2023	0.723	2.40	4.81
PFDoA	307-55-1	2.40 U	D7463-FS(0)	1.000	8/19/2023	0.731	2.40	4.81
PFTrDA	72629-94-8	2.40 U	D7463-FS(0)	1.000	8/19/2023	0.713	2.40	4.81
PFTeDA	376-06-7	2.40 U	D7463-FS(0)	1.000	8/19/2023	0.761	2.40	4.81
NMeFOSAA	2355-31-9	2.40 U	D7463-FS(0)	1.000	8/19/2023	0.990	2.40	4.81
NEtFOSAA	2991-50-6	2.40 U	D7463-FS(0)	1.000	8/19/2023	0.952	2.40	4.81
PFBS	375-73-5	2.40 U	D7463-FS(0)	1.000	8/19/2023	0.833	2.40	4.81
PFHxS	355-46-4	2.40 U	D7463-FS(0)	1.000	8/19/2023	0.959	2.40	4.81
PFOS	1763-23-1	2.40 U	D7463-FS(0)	1.000	8/19/2023	1.03	2.40	4.81
HFPO-DA	13252-13-6	2.40 U	D7463-FS(0)	1.000	8/19/2023	0.832	2.40	4.81
Adona	919005-14-4	2.40 U	D7463-FS(0)	1.000	8/19/2023	0.836	2.40	4.81
9Cl-PF3ONS	756426-58-1	2.40 U	D7463-FS(0)	1.000	8/19/2023	0.990	2.40	4.81
11Cl-PF3OUdS	763051-92-9	2.40 U	D7463-FS(0)	1.000	8/19/2023	0.866	2.40	4.81

NW 9/10/23

Analyzed by: Harnden, Kelsey
Printed: 8/22/2023

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

2

Client ID	NBKK-EB01-080923
Battelle ID	D7464-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/17/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.257
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.43 U	D7464-FS(0)	1.000	8/19/2023	0.888	2.43	4.86
PFHpA	375-85-9	2.43 U	D7464-FS(0)	1.000	8/19/2023	0.915	2.43	4.86
PFOA	335-67-1	2.43 U	D7464-FS(0)	1.000	8/19/2023	0.982	2.43	4.86
PFNA	375-95-1	2.43 U	D7464-FS(0)	1.000	8/19/2023	0.810	2.43	4.86
PFDA	335-76-2	2.43 U	D7464-FS(0)	1.000	8/19/2023	0.763	2.43	4.86
PFUnA	2058-94-8	2.43 U	D7464-FS(0)	1.000	8/19/2023	0.732	2.43	4.86
PFDoA	307-55-1	2.43 U	D7464-FS(0)	1.000	8/19/2023	0.739	2.43	4.86
PFTrDA	72629-94-8	2.43 U	D7464-FS(0)	1.000	8/19/2023	0.722	2.43	4.86
PFTeDA	376-06-7	2.43 U	D7464-FS(0)	1.000	8/19/2023	0.769	2.43	4.86
NMeFOSAA	2355-31-9	2.43 U	D7464-FS(0)	1.000	8/19/2023	1.00	2.43	4.86
NEtFOSAA	2991-50-6	2.43 U	D7464-FS(0)	1.000	8/19/2023	0.963	2.43	4.86
PFBS	375-73-5	2.43 U	D7464-FS(0)	1.000	8/19/2023	0.842	2.43	4.86
PFHxS	355-46-4	2.43 U	D7464-FS(0)	1.000	8/19/2023	0.970	2.43	4.86
PFOS	1763-23-1	2.43 U	D7464-FS(0)	1.000	8/19/2023	1.04	2.43	4.86
HFPO-DA	13252-13-6	2.43 U	D7464-FS(0)	1.000	8/19/2023	0.841	2.43	4.86
Adona	919005-14-4	2.43 U	D7464-FS(0)	1.000	8/19/2023	0.845	2.43	4.86
9Cl-PF3ONS	756426-58-1	2.43 U	D7464-FS(0)	1.000	8/19/2023	1.00	2.43	4.86
11Cl-PF3OUdS	763051-92-9	2.43 U	D7464-FS(0)	1.000	8/19/2023	0.876	2.43	4.86

NW 9/19/23

Analyzed by: Harnden, Kelsey
Printed: 8/22/2023

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

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Client ID	NBKK-EB02-080923
Battelle ID	D7478-F5
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/17/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.262
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.871	2.39	4.77
PFHpA	375-85-9	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.898	2.39	4.77
PFOA	335-67-1	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.964	2.39	4.77
PFNA	375-95-1	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.795	2.39	4.77
PFDA	335-76-2	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.748	2.39	4.77
PFUnA	2058-94-8	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.718	2.39	4.77
PFDoA	307-55-1	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.725	2.39	4.77
PFTrDA	72629-94-8	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.708	2.39	4.77
PFTeDA	376-06-7	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.755	2.39	4.77
NMeFOSAA	2355-31-9	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.983	2.39	4.77
NEtFOSAA	2991-50-6	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.945	2.39	4.77
PFBS	375-73-5	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.826	2.39	4.77
PFHxS	355-46-4	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.951	2.39	4.77
PFOS	1763-23-1	2.39 U	D7478-FS(0)	1.000	8/19/2023	1.02	2.39	4.77
HFPO-DA	13252-13-6	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.825	2.39	4.77
Adona	919005-14-4	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.829	2.39	4.77
9Cl-PF3ONS	756426-58-1	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.983	2.39	4.77
11Cl-PF3OUdS	763051-92-9	2.39 U	D7478-FS(0)	1.000	8/19/2023	0.860	2.39	4.77

NW 9/10/23

Analyzed by: Harnden, Kelsey
Printed: 8/22/2023

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 23-0998
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: September 10, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-B76-SB08-1516	D7459-FS	Soil
2	NBKK-B76-SB08P-1516	D7460-FS	Soil
3	NBKK-B76-SS11-0001	D7461-FS	Soil
4	NBKK-B76-SB11-0103	D7462-FS	Soil
5	NBKK-B76-SS06-0001	D7465-FS	Soil
6	NBKK-B76-SS08-0001	D7466-FS	Soil
7	NBKK-B76-SS09-0001	D7467-FS	Soil
8	NBKK-B76-SB09-1415	D7468-FS	Soil
9	NBKK-B76-SS10-0001	D7469-FS	Soil
10	NBKK-B76-SB10-0103	D7470-FS	Soil
11	NBKK-B76-SS12-0001	D7471-FS	Soil
12	NBKK-B76-SB12-0103	D7472-FS	Soil
12MS	NBKK-B76-SB12-0103MS	D7473-FSMS	Soil
12MSD	NBKK-B76-SB12-0103MSD	D7474-FSMSD	Soil
13	NBKK-B76-SS13-0001	D7475-FS	Soil
14	NBKK-B76-SS13P-0001	D7476-FS	Soil
15	NBKK-B76-SB13-0103	D7477-FS	Soil

A Stage 2B/4 data validation was performed on the analytical data for fifteen soil samples collected on August 8-9, 2023 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, 3, and 4 Revised Table for Sample Qualification in the Presence of Blank Contamination, February 2022;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample results are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-B76-EB01-080823	PFHxA	0.969	None	All Associated ND
NBKK-B76-EB01-081023	None - ND	-	-	-
NBKK-B76-EB01-080923	None - ND	-	-	-
NBKK-B76-EB02-080923	None - ND	-	-	-
NBKK-B76-FB01-081123	PFHxA	0.917	None	All Associated ND
	PFDA	0.964		
	11C1-PF3OUdS	1.56		

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R) except for the following.

EDS Sample	Surrogate	%R	Qualifier
12	d3-MeFOSAA	41%	UJ - Associated Cmpds
	d5-EtFOSAA	38%	

Laboratory Control Sample (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	NBKK-B76-SB08-1516 ng/g	NBKK-B76-SB08P-1516 ng/g	RPD	Qualifier
None	ND	ND	-	-

Compound	NBKK-B76-SS13-0001 ng/g	NBKK-B76-SS13P-0001 ng/g	RPD	Qualifier
PFOS	1.33	4.54	109%	None - <5X LOQ

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 9/11/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-876-5808-1516
Battelle ID	D7459-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	8.23
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.173	0.500	1.00
PFOS	1763-23-1	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.150	0.500	2.00

MW 9/10/23

Analyzed by: Harnden, Kelsey
Printed: 8/25/2023

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2

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB08P-1516
Battelle ID	D7460-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	8.23
Matrix	SOIL
Sample Size	4.990
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.178	0.501	1.00
PFHpA	375-85-9	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.168	0.501	1.00
PFOA	335-67-1	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.214	0.501	1.00
PFNA	375-95-1	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.157	0.501	1.00
PFDA	335-76-2	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.158	0.501	1.00
PFUnA	2058-94-8	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.156	0.501	1.00
PFDoA	307-55-1	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.160	0.501	1.00
PFTrDA	72629-94-8	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.161	0.501	1.00
PFTeDA	376-06-7	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.162	0.501	2.00
NMeFOSAA	2355-31-9	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.159	0.501	2.00
NEtFOSAA	2991-50-6	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.165	0.501	2.00
PFBS	375-73-5	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.171	0.501	1.00
PFHxS	355-46-4	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.173	0.501	1.00
PFOS	1763-23-1	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.175	0.501	1.00
HFPO-DA	13252-13-6	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.159	0.501	2.00
Adona	919005-14-4	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.160	0.501	2.00
9Cl-PF3ONS	756426-58-1	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.154	0.501	2.00
11Cl-PF3OUdS	763051-92-9	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.150	0.501	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B7G-SS11-0001
Battelle ID	D7461-FS
Sample Type	SA
Collection Date	08/08/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	3.50
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.173	0.500	1.00
PFOS	1763-23-1	0.235 J	D7461-FS(0)	1.000	8/24/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.150	0.500	2.00

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4

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB11-0103
Battelle ID	D7462-FS
Sample Type	SA
Collection Date	08/08/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	7.20
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.168	0.500	1.00
PFOA	335-67-1	0.328 J	D7462-FS(0)	1.000	8/24/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.173	0.500	1.00
PFOS	1763-23-1	4.72	D7462-FS(0)	1.000	8/24/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.150	0.500	2.00

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Isotope Dilution

523-0998_Master_3690

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SS06-0001
Battelle ID	D7465-FS
Sample Type	SA
Collection Date	08/08/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	14.81
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.173	0.500	1.00
PFOS	1763-23-1	0.875 J	D7465-FS(0)	1.000	8/24/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.150	0.500	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-5508-0001
Battelle ID	D7466-FS
Sample Type	SA
Collection Date	08/10/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	17.91
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.168	0.500	1.00
PFOA	335-67-1	0.369 J	D7466-FS(0)	1.000	8/24/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.173	0.500	1.00
PFOS	1763-23-1	7.50	D7466-FS(0)	1.000	8/24/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.150	0.500	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-876-SS09-0001
Battelle ID	D7467-F5
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	5.86
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.173	0.499	0.998
PFOS	1763-23-1	0.373 J	D7467-FS(0)	1.000	8/24/2023	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.150	0.499	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB09-1415
Battelle ID	D7468-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	11.33
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.173	0.500	1.00
PFOS	1763-23-1	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.150	0.500	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SS10-0001
Battelle ID	D7469-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	8.32
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.173	0.500	1.00
PFOS	1763-23-1	2.57	D7469-FS(0)	1.000	8/24/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.150	0.500	2.00

MW 9/10/23
Analyzed by: Harnden, Kelsey
Printed: 8/25/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB10-0103
Battelle ID	D7470-F5
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	7.02
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.173	0.499	0.998
PFOS	1763-23-1	0.876 J	D7470-FS(0)	1.000	8/24/2023	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.150	0.499	2.00

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Analyzed by: Harnden, Kelsey
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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SS12-0001
Battelle ID	D7471-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	4.98
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.532 J	D7471-FS(0)	1.000	8/24/2023	0.173	0.500	1.00
PFOS	1763-23-1	2.41	D7471-FS(0)	1.000	8/24/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.150	0.500	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB12-0103
Battelle ID	D7472-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	8.17
Matrix	SOIL
Sample Size	5.000
Size Unit Basis	E

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.178	0.500	1.00	
PFHpA	375-85-9	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.168	0.500	1.00	
PFOA	335-67-1	0.558 J	D7472-FS(0)	1.000	8/24/2023	0.214	0.500	1.00	
PFNA	375-95-1	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.157	0.500	1.00	
PFDA	335-76-2	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.158	0.500	1.00	
PFUnA	2058-94-8	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.156	0.500	1.00	
PFDoA	307-55-1	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.160	0.500	1.00	
PFTrDA	72629-94-8	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.161	0.500	1.00	
PFTeDA	376-06-7	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.162	0.500	2.00	
NMeFOSAA	2355-31-9	0.500 ~~U~~ UJ	D7472-FS(0)	1.000	8/24/2023	0.159	0.500	2.00	SSL
NEtFOSAA	2991-50-6	0.500 ~~U~~ UJ	D7472-FS(0)	1.000	8/24/2023	0.165	0.500	2.00	SSL
PFBS	375-73-5	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.171	0.500	1.00	
PFHxS	355-46-4	0.231 J	D7472-FS(0)	1.000	8/24/2023	0.173	0.500	1.00	
PFOS	1763-23-1	0.876 J	D7472-FS(0)	1.000	8/24/2023	0.175	0.500	1.00	
HFPO-DA	13252-13-6	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.159	0.500	2.00	
Adona	919005-14-4	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.160	0.500	2.00	
9Cl-PF3ONS	756426-58-1	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.154	0.500	2.00	
11Cl-PF3OUdS	763051-92-9	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.150	0.500	2.00	

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB12-0103
Battelle ID	D7472-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	81	D7472-FS(0)	8/24/2023
13C4-PFHpA	75	D7472-FS(0)	8/24/2023
13C8-PFOA	86	D7472-FS(0)	8/24/2023
13C9-PFNA	86	D7472-FS(0)	8/24/2023
13C6-PFDA	81	D7472-FS(0)	8/24/2023
13C7-PFUnA	59	D7472-FS(0)	8/24/2023
13C2-PFDoA	51	D7472-FS(0)	8/24/2023
13C2-PFTeDA	65	D7472-FS(0)	8/24/2023
d3-MeFOSAA	41	D7472-FS(0)	8/24/2023
d5-EtFOSAA	38 M	D7472-FS(0)	8/24/2023
13C3-PFBS	66	D7472-FS(0)	8/24/2023
13C3-PFHxS	66	D7472-FS(0)	8/24/2023
13C8-PFOS	62	D7472-FS(0)	8/24/2023
13C3-HFPO-DA	84	D7472-FS(0)	8/24/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SS13-0001
Battelle ID	D7475-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	3.66
Matrix	SOIL
Sample Size	5.010
Size Unit Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.173	0.499	0.998
PFOS	1763-23-1	1.33	D7475-FS(0)	1.000	8/24/2023	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.150	0.499	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SS13P-0001
Battelle ID	D7476-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	4.53
Matrix	SOIL
Sample Size	4.990
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.178	0.501	1.00
PFHpA	375-85-9	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.168	0.501	1.00
PFOA	335-67-1	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.214	0.501	1.00
PFNA	375-95-1	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.157	0.501	1.00
PFDA	335-76-2	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.158	0.501	1.00
PFUnA	2058-94-8	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.156	0.501	1.00
PFDoA	307-55-1	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.160	0.501	1.00
PFTrDA	72629-94-8	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.161	0.501	1.00
PFTeDA	376-06-7	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.162	0.501	2.00
NMeFOSAA	2355-31-9	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.159	0.501	2.00
NEtFOSAA	2991-50-6	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.165	0.501	2.00
PFBS	375-73-5	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.171	0.501	1.00
PFHxS	355-46-4	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.173	0.501	1.00
PFOS	1763-23-1	4.54	D7476-FS(0)	1.000	8/24/2023	0.175	0.501	1.00
HFPO-DA	13252-13-6	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.159	0.501	2.00
Adona	919005-14-4	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.160	0.501	2.00
9Cl-PF3ONS	756426-58-1	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.154	0.501	2.00
11Cl-PF3OUdS	763051-92-9	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.150	0.501	2.00

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Analyzed by: Harnden, Kelsey
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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB13-0103
Battelle ID	D7477-F5
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	6.98
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.168	0.500	1.00
PFOA	335-67-1	0.218 J	D7477-FS(0)	1.000	8/25/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.173	0.500	1.00
PFOS	1763-23-1	5.47	D7477-FS(0)	1.000	8/25/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.150	0.500	2.00

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Analyzed by: Harnden, Kelsey
Printed: 8/25/2023

Isotope Dilution

523-D998_Master_369D

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 23-0998
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: September 10, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-B76-SB08-1516	D7459-FS	Soil
2	NBKK-B76-SB08P-1516	D7460-FS	Soil
3	NBKK-B76-SS11-0001	D7461-FS	Soil
4	NBKK-B76-SB11-0103	D7462-FS	Soil
5	NBKK-B76-SS06-0001	D7465-FS	Soil
6	NBKK-B76-SS08-0001	D7466-FS	Soil
7	NBKK-B76-SS09-0001	D7467-FS	Soil
8	NBKK-B76-SB09-1415	D7468-FS	Soil
9	NBKK-B76-SS10-0001	D7469-FS	Soil
10	NBKK-B76-SB10-0103	D7470-FS	Soil
11	NBKK-B76-SS12-0001	D7471-FS	Soil
12	NBKK-B76-SB12-0103	D7472-FS	Soil
12MS	NBKK-B76-SB12-0103MS	D7473-FSMS	Soil
12MSD	NBKK-B76-SB12-0103MSD	D7474-FSMSD	Soil
13	NBKK-B76-SS13-0001	D7475-FS	Soil
14	NBKK-B76-SS13P-0001	D7476-FS	Soil
15	NBKK-B76-SB13-0103	D7477-FS	Soil

A Stage 2B/4 data validation was performed on the analytical data for fifteen soil samples collected on August 8-10, 2023 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, 3, and 4 Revised Table for Sample Qualification in the Presence of Blank Contamination, February 2022;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample results are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-B76-EB01-080823	PFHxA	0.969	None	All Associated ND
NBKK-B76-EB01-081023	None - ND	-	-	-
NBKK-B76-EB01-080923	None - ND	-	-	-
NBKK-B76-EB02-080923	None - ND	-	-	-
NBKK-B76-FB01-081123	PFHxA	0.917	None	All Associated ND
	PFDA	0.964		
	11C1-PF3OUdS	1.56		

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R) except for the following.

EDS Sample	Surrogate	%R	Qualifier
12	d3-MeFOSAA	41%	UJ - Associated Cmpds
	d5-EtFOSAA	38%	

Laboratory Control Sample (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	NBKK-B76-SB08-1516 ng/g	NBKK-B76-SB08P-1516 ng/g	RPD	Qualifier
None	ND	ND	-	-

Compound	NBKK-B76-SS13-0001 ng/g	NBKK-B76-SS13P-0001 ng/g	RPD	Qualifier
PFOS	1.33	4.54	109%	None - <5X LOQ

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 9/11/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-876-5808-1516
Battelle ID	D7459-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	8.23
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.173	0.500	1.00
PFOS	1763-23-1	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7459-FS(0)	1.000	8/24/2023	0.150	0.500	2.00

MW 9/10/23

Analyzed by: Harnden, Kelsey
Printed: 8/25/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB08P-1516
Battelle ID	D7460-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	8.23
Matrix	SOIL
Sample Size	4.990
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.178	0.501	1.00
PFHpA	375-85-9	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.168	0.501	1.00
PFOA	335-67-1	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.214	0.501	1.00
PFNA	375-95-1	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.157	0.501	1.00
PFDA	335-76-2	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.158	0.501	1.00
PFUnA	2058-94-8	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.156	0.501	1.00
PFDoA	307-55-1	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.160	0.501	1.00
PFTrDA	72629-94-8	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.161	0.501	1.00
PFTeDA	376-06-7	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.162	0.501	2.00
NMeFOSAA	2355-31-9	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.159	0.501	2.00
NEtFOSAA	2991-50-6	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.165	0.501	2.00
PFBS	375-73-5	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.171	0.501	1.00
PFHxS	355-46-4	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.173	0.501	1.00
PFOS	1763-23-1	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.175	0.501	1.00
HFPO-DA	13252-13-6	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.159	0.501	2.00
Adona	919005-14-4	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.160	0.501	2.00
9Cl-PF3ONS	756426-58-1	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.154	0.501	2.00
11Cl-PF3OUdS	763051-92-9	0.501 U	D7460-FS(0)	1.000	8/24/2023	0.150	0.501	2.00

NW 9/10/23

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Printed: 8/25/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B7G-SS11-0001
Battelle ID	D7461-FS
Sample Type	SA
Collection Date	08/08/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	3.50
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.173	0.500	1.00
PFOS	1763-23-1	0.235 J	D7461-FS(0)	1.000	8/24/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7461-FS(0)	1.000	8/24/2023	0.150	0.500	2.00

NW 9/10/23

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Printed: 8/25/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB11-0103
Battelle ID	D7462-FS
Sample Type	SA
Collection Date	08/08/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	7.20
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.168	0.500	1.00
PFOA	335-67-1	0.328 J	D7462-FS(0)	1.000	8/24/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.173	0.500	1.00
PFOS	1763-23-1	4.72	D7462-FS(0)	1.000	8/24/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7462-FS(0)	1.000	8/24/2023	0.150	0.500	2.00

NW 9/10/23
Analyzed by: Harnden, Kelsey
Printed: 8/25/2023

Isotope Dilution

523-0998_Master_3690

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SS06-0001
Battelle ID	D7465-FS
Sample Type	SA
Collection Date	08/08/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	14.81
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.173	0.500	1.00
PFOS	1763-23-1	0.875 J	D7465-FS(0)	1.000	8/24/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7465-FS(0)	1.000	8/24/2023	0.150	0.500	2.00

MW 9/10/23
Analyzed by: Harnden, Kelsey
Printed: 8/25/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-5508-0001
Battelle ID	D7466-FS
Sample Type	SA
Collection Date	08/10/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	17.91
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.168	0.500	1.00
PFOA	335-67-1	0.369 J	D7466-FS(0)	1.000	8/24/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.173	0.500	1.00
PFOS	1763-23-1	7.50	D7466-FS(0)	1.000	8/24/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7466-FS(0)	1.000	8/24/2023	0.150	0.500	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-876-SS09-0001
Battelle ID	D7467-F5
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	5.86
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.173	0.499	0.998
PFOS	1763-23-1	0.373 J	D7467-FS(0)	1.000	8/24/2023	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	D7467-FS(0)	1.000	8/24/2023	0.150	0.499	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB09-1415
Battelle ID	D7468-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	11.33
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.173	0.500	1.00
PFOS	1763-23-1	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7468-FS(0)	1.000	8/24/2023	0.150	0.500	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SS10-0001
Battelle ID	D7469-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	8.32
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.173	0.500	1.00
PFOS	1763-23-1	2.57	D7469-FS(0)	1.000	8/24/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7469-FS(0)	1.000	8/24/2023	0.150	0.500	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB10-0103
Battelle ID	D7470-F5
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	7.02
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.173	0.499	0.998
PFOS	1763-23-1	0.876 J	D7470-FS(0)	1.000	8/24/2023	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	D7470-FS(0)	1.000	8/24/2023	0.150	0.499	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SS12-0001
Battelle ID	D7471-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	4.98
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.532 J	D7471-FS(0)	1.000	8/24/2023	0.173	0.500	1.00
PFOS	1763-23-1	2.41	D7471-FS(0)	1.000	8/24/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7471-FS(0)	1.000	8/24/2023	0.150	0.500	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB12-0103
Battelle ID	D7472-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	8.17
Matrix	SOIL
Sample Size	5.000
Size Unit Basis	E

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ	
PFHxA	307-24-4	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.178	0.500	1.00	
PFHpA	375-85-9	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.168	0.500	1.00	
PFOA	335-67-1	0.558 J	D7472-FS(0)	1.000	8/24/2023	0.214	0.500	1.00	
PFNA	375-95-1	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.157	0.500	1.00	
PFDA	335-76-2	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.158	0.500	1.00	
PFUnA	2058-94-8	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.156	0.500	1.00	
PFDoA	307-55-1	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.160	0.500	1.00	
PFTrDA	72629-94-8	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.161	0.500	1.00	
PFTeDA	376-06-7	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.162	0.500	2.00	
NMeFOSAA	2355-31-9	0.500 ~~U~~ UJ	D7472-FS(0)	1.000	8/24/2023	0.159	0.500	2.00	SSL
NEtFOSAA	2991-50-6	0.500 ~~U~~ UJ	D7472-FS(0)	1.000	8/24/2023	0.165	0.500	2.00	SSL
PFBS	375-73-5	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.171	0.500	1.00	
PFHxS	355-46-4	0.231 J	D7472-FS(0)	1.000	8/24/2023	0.173	0.500	1.00	
PFOS	1763-23-1	0.876 J	D7472-FS(0)	1.000	8/24/2023	0.175	0.500	1.00	
HFPO-DA	13252-13-6	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.159	0.500	2.00	
Adona	919005-14-4	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.160	0.500	2.00	
9Cl-PF3ONS	756426-58-1	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.154	0.500	2.00	
11Cl-PF3OUdS	763051-92-9	0.500 U	D7472-FS(0)	1.000	8/24/2023	0.150	0.500	2.00	

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Isotope Dilution

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB12-0103
Battelle ID	D7472-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	81	D7472-FS(0)	8/24/2023
13C4-PFHpA	75	D7472-FS(0)	8/24/2023
13C8-PFOA	86	D7472-FS(0)	8/24/2023
13C9-PFNA	86	D7472-FS(0)	8/24/2023
13C6-PFDA	81	D7472-FS(0)	8/24/2023
13C7-PFUnA	59	D7472-FS(0)	8/24/2023
13C2-PFDoA	51	D7472-FS(0)	8/24/2023
13C2-PFTeDA	65	D7472-FS(0)	8/24/2023
d3-MeFOSAA	41	D7472-FS(0)	8/24/2023
d5-EtFOSAA	38 M	D7472-FS(0)	8/24/2023
13C3-PFBS	66	D7472-FS(0)	8/24/2023
13C3-PFHxS	66	D7472-FS(0)	8/24/2023
13C8-PFOS	62	D7472-FS(0)	8/24/2023
13C3-HFPO-DA	84	D7472-FS(0)	8/24/2023

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Printed: 8/25/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SS13-0001
Battelle ID	D7475-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	3.66
Matrix	SOIL
Sample Size	5.010
Size Unit Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.173	0.499	0.998
PFOS	1763-23-1	1.33	D7475-FS(0)	1.000	8/24/2023	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	D7475-FS(0)	1.000	8/24/2023	0.150	0.499	2.00

MW 9/10/23

Analyzed by: Harnden, Kelsey
Printed: 8/25/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SS13P-0001
Battelle ID	D7476-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	4.53
Matrix	SOIL
Sample Size	4.990
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.178	0.501	1.00
PFHpA	375-85-9	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.168	0.501	1.00
PFOA	335-67-1	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.214	0.501	1.00
PFNA	375-95-1	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.157	0.501	1.00
PFDA	335-76-2	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.158	0.501	1.00
PFUnA	2058-94-8	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.156	0.501	1.00
PFDoA	307-55-1	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.160	0.501	1.00
PFTrDA	72629-94-8	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.161	0.501	1.00
PFTeDA	376-06-7	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.162	0.501	2.00
NMeFOSAA	2355-31-9	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.159	0.501	2.00
NEtFOSAA	2991-50-6	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.165	0.501	2.00
PFBS	375-73-5	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.171	0.501	1.00
PFHxS	355-46-4	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.173	0.501	1.00
PFOS	1763-23-1	4.54	D7476-FS(0)	1.000	8/24/2023	0.175	0.501	1.00
HFPO-DA	13252-13-6	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.159	0.501	2.00
Adona	919005-14-4	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.160	0.501	2.00
9Cl-PF3ONS	756426-58-1	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.154	0.501	2.00
11Cl-PF3OUdS	763051-92-9	0.501 U	D7476-FS(0)	1.000	8/24/2023	0.150	0.501	2.00

NW 9/10/23
Analyzed by: Harnden, Kelsey
Printed: 8/25/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB13-0103
Battelle ID	D7477-F5
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	6.98
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.168	0.500	1.00
PFOA	335-67-1	0.218 J	D7477-FS(0)	1.000	8/25/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.173	0.500	1.00
PFOS	1763-23-1	5.47	D7477-FS(0)	1.000	8/25/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7477-FS(0)	1.000	8/25/2023	0.150	0.500	2.00

MW 9/10/23

Analyzed by: Harnden, Kelsey
Printed: 8/25/2023

Isotope Dilution

523-D998_Master_369D

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 23-1033
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: September 10, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-B76-FB01-081123	D7881-FS	Water
2	NBKK-B76-EB01-081123	D7882-FS	Water
3	NBKK-B76-EB01-081023	D7888-FS	Water
4	NBKK-B76-MW06-0823	D7893-FS	Water
5	NBKK-B76-MW06P-0823	D7894-FS	Water
6	NBKK-B76-FB01-081423	D7895-FS	Water
7	NBKK-B76-MW08-0823	D7896-FS	Water
8	NBKK-B76-MW07-0823	D7897-FS	Water
9	NBKK-B76-EB01-081523	D7898-FS	Water
10	NBKK-B76-MW09-0823	D7899-FS	Water
10MS	NBKK-B76-MW09-0823MS	D7900-FSMS	Water
10MSD	NBKK-B76-MW09-0823MSD	D7901-FSMSD	Water

A Stage 2B/4 data validation was performed on the analytical data for five water samples, three aqueous equipment blank samples, and two aqueous field blank samples collected on August 10-15, 2023 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;

- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, 3, and 4 Revised Table for Sample Qualification in the Presence of Blank Contamination, February 2022;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample results are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-B76-FB01-081123	PFHxA	0.917	None	Applies to other Packages
	PFDA	0.964		
	11C1-PF3OUdS	1.56		
NBKK-B76-EB01-081123	PFDA	0.765	None	Applies to other Packages
NBKK-B76-EB01-081023	None - ND	-	-	-
NBKK-B76-FB01-081423	None - ND	-	-	-
NBKK-B76-EB01-081523	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Control Sample (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below. The precision was acceptable.

Compound	NBKK-B76-MW06-0823 ng/L	NBKK-B76-MW06P-0823 ng/L	RPD	Qualifier
None	ND	ND	-	-

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 9/11/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-FB01-081123
Battelle ID	D7881-FS
Sample Type	SA
Collection Date	08/11/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.253
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.917 J	D7881-FS(0)	1.000	8/23/2023	0.902	2.47	4.94
PFHpA	375-85-9	2.47 U	D7881-FS(0)	1.000	8/23/2023	0.930	2.47	4.94
PFOA	335-67-1	2.47 U	D7881-FS(0)	1.000	8/23/2023	0.998	2.47	4.94
PFNA	375-95-1	2.47 U	D7881-FS(0)	1.000	8/23/2023	0.823	2.47	4.94
PFDA	335-76-2	0.964 J	D7881-FS(0)	1.000	8/23/2023	0.775	2.47	4.94
PFUnA	2058-94-8	2.47 U	D7881-FS(0)	1.000	8/23/2023	0.743	2.47	4.94
PFDoA	307-55-1	2.47 U	D7881-FS(0)	1.000	8/23/2023	0.751	2.47	4.94
PFTrDA	72629-94-8	2.47 U	D7881-FS(0)	1.000	8/23/2023	0.733	2.47	4.94
PFTeDA	376-06-7	2.47 U	D7881-FS(0)	1.000	8/23/2023	0.782	2.47	4.94
NMeFOSAA	2355-31-9	2.47 U	D7881-FS(0)	1.000	8/23/2023	1.02	2.47	4.94
NEtFOSAA	2991-50-6	2.47 U	D7881-FS(0)	1.000	8/23/2023	0.978	2.47	4.94
PFBS	375-73-5	2.47 U	D7881-FS(0)	1.000	8/23/2023	0.856	2.47	4.94
PFHxS	355-46-4	2.47 U	D7881-FS(0)	1.000	8/23/2023	0.985	2.47	4.94
PFOS	1763-23-1	2.47 U	D7881-FS(0)	1.000	8/23/2023	1.06	2.47	4.94
HFPO-DA	13252-13-6	2.47 U	D7881-FS(0)	1.000	8/23/2023	0.855	2.47	4.94
Adona	919005-14-4	2.47 U	D7881-FS(0)	1.000	8/23/2023	0.859	2.47	4.94
9Cl-PF3ONS	756426-58-1	2.47 U	D7881-FS(0)	1.000	8/23/2023	1.02	2.47	4.94
11Cl-PF3OUdS	763051-92-9	1.56 J	D7881-FS(0)	1.000	8/23/2023	0.890	2.47	4.94

NW 9/10/23

Analyzed by: Harnden, Kelsey
Printed: 8/23/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-EB01-081123
Battelle ID	D7882-FS
Sample Type	SA
Collection Date	08/11/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.277
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.824	2.26	4.51
PFHpA	375-85-9	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.849	2.26	4.51
PFOA	335-67-1	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.912	2.26	4.51
PFNA	375-95-1	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.752	2.26	4.51
PFDA	335-76-2	0.765 J	D7882-FS(0)	1.000	8/23/2023	0.708	2.26	4.51
PFUnA	2058-94-8	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.679	2.26	4.51
PFDoA	307-55-1	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.686	2.26	4.51
PFTrDA	72629-94-8	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.670	2.26	4.51
PFTeDA	376-06-7	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.714	2.26	4.51
NMeFOSAA	2355-31-9	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.930	2.26	4.51
NEtFOSAA	2991-50-6	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.894	2.26	4.51
PFBS	375-73-5	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.782	2.26	4.51
PFHxS	355-46-4	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.900	2.26	4.51
PFOS	1763-23-1	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.966	2.26	4.51
HFPO-DA	13252-13-6	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.781	2.26	4.51
Adona	919005-14-4	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.784	2.26	4.51
9Cl-PF3ONS	756426-58-1	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.930	2.26	4.51
11Cl-PF3OUdS	763051-92-9	2.26 U	D7882-FS(0)	1.000	8/23/2023	0.813	2.26	4.51

MW 9/10/23
Analyzed by: Harnden, Kelsey
Printed: 8/23/2023

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3

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-876-EB01-081023
Battelle ID	D7888-FS
Sample Type	SA
Collection Date	08/10/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	W
Sample Size	0.273
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.836	2.29	4.58
PFHpA	375-85-9	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.862	2.29	4.58
PFOA	335-67-1	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.925	2.29	4.58
PFNA	375-95-1	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.763	2.29	4.58
PFDA	335-76-2	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.718	2.29	4.58
PFUnA	2058-94-8	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.689	2.29	4.58
PFDoA	307-55-1	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.696	2.29	4.58
PFTrDA	72629-94-8	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.679	2.29	4.58
PFTeDA	376-06-7	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.724	2.29	4.58
NMeFOSAA	2355-31-9	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.943	2.29	4.58
NEtFOSAA	2991-50-6	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.907	2.29	4.58
PFBS	375-73-5	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.793	2.29	4.58
PFHxS	355-46-4	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.913	2.29	4.58
PFOS	1763-23-1	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.980	2.29	4.58
HFPO-DA	13252-13-6	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.792	2.29	4.58
Adona	919005-14-4	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.796	2.29	4.58
9Cl-PF3ONS	756426-58-1	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.943	2.29	4.58
11Cl-PF3OUdS	763051-92-9	2.29 U	D7888-FS(0)	1.000	8/23/2023	0.825	2.29	4.58

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKX-B76-MW06-0823
Battelle ID	D7893-FS
Sample Type	SA
Collection Date	08/14/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.273
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.836	2.29	4.58
PFHpA	375-85-9	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.862	2.29	4.58
PFOA	335-67-1	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.925	2.29	4.58
PFNA	375-95-1	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.763	2.29	4.58
PFDA	335-76-2	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.718	2.29	4.58
PFUnA	2058-94-8	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.689	2.29	4.58
PFDoA	307-55-1	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.696	2.29	4.58
PFTrDA	72629-94-8	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.679	2.29	4.58
PFTeDA	376-06-7	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.724	2.29	4.58
NMeFOSAA	2355-31-9	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.943	2.29	4.58
NEtFOSAA	2991-50-6	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.907	2.29	4.58
PFBS	375-73-5	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.793	2.29	4.58
PFHxS	355-46-4	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.913	2.29	4.58
PFOS	1763-23-1	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.980	2.29	4.58
HFPO-DA	13252-13-6	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.792	2.29	4.58
Adona	919005-14-4	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.796	2.29	4.58
9Cl-PF3ONS	756426-58-1	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.943	2.29	4.58
11Cl-PF3OUdS	763051-92-9	2.29 U	D7893-FS(0)	1.000	8/23/2023	0.825	2.29	4.58

MW 9/10/23

Analyzed by: Harnden, Kelsey
Printed: 8/23/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-MW06P-0823
Battelle ID	D7894-FS
Sample Type	SA
Collection Date	08/14/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.250
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.50 U	D7894-FS(0)	1.000	8/23/2023	0.913	2.50	5.00
PFHpA	375-85-9	2.50 U	D7894-FS(0)	1.000	8/23/2023	0.941	2.50	5.00
PFOA	335-67-1	2.50 U	D7894-FS(0)	1.000	8/23/2023	1.01	2.50	5.00
PFNA	375-95-1	2.50 U	D7894-FS(0)	1.000	8/23/2023	0.833	2.50	5.00
PFDA	335-76-2	2.50 U	D7894-FS(0)	1.000	8/23/2023	0.784	2.50	5.00
PFUnA	2058-94-8	2.50 U	D7894-FS(0)	1.000	8/23/2023	0.752	2.50	5.00
PFDoA	307-55-1	2.50 U	D7894-FS(0)	1.000	8/23/2023	0.760	2.50	5.00
PFTrDA	72629-94-8	2.50 U	D7894-FS(0)	1.000	8/23/2023	0.742	2.50	5.00
PFTeDA	376-06-7	2.50 U	D7894-FS(0)	1.000	8/23/2023	0.791	2.50	5.00
NMeFOSAA	2355-31-9	2.50 U	D7894-FS(0)	1.000	8/23/2023	1.03	2.50	5.00
NEtFOSAA	2991-50-6	2.50 U	D7894-FS(0)	1.000	8/23/2023	0.990	2.50	5.00
PFBS	375-73-5	2.50 U	D7894-FS(0)	1.000	8/23/2023	0.866	2.50	5.00
PFHxS	355-46-4	2.50 U	D7894-FS(0)	1.000	8/23/2023	0.997	2.50	5.00
PFOS	1763-23-1	2.50 U	D7894-FS(0)	1.000	8/23/2023	1.07	2.50	5.00
HFPO-DA	13252-13-6	2.50 U	D7894-FS(0)	1.000	8/23/2023	0.865	2.50	5.00
Adona	919005-14-4	2.50 U	D7894-FS(0)	1.000	8/23/2023	0.869	2.50	5.00
9Cl-PF3ONS	756426-58-1	2.50 U	D7894-FS(0)	1.000	8/23/2023	1.03	2.50	5.00
11Cl-PF3OUdS	763051-92-9	2.50 U	D7894-FS(0)	1.000	8/23/2023	0.901	2.50	5.00

MW 9/10/23
Analyzed by: Harnden, Kelsey
Printed: 8/23/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-FB01-081423
Battelle ID	D7895-FS
Sample Type	SA
Collection Date	08/14/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.250
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.50 U	D7895-FS(0)	1.000	8/23/2023	0.913	2.50	5.00
PFHpA	375-85-9	2.50 U	D7895-FS(0)	1.000	8/23/2023	0.941	2.50	5.00
PFOA	335-67-1	2.50 U	D7895-FS(0)	1.000	8/23/2023	1.01	2.50	5.00
PFNA	375-95-1	2.50 U	D7895-FS(0)	1.000	8/23/2023	0.833	2.50	5.00
PFDA	335-76-2	2.50 U	D7895-FS(0)	1.000	8/23/2023	0.784	2.50	5.00
PFUnA	2058-94-8	2.50 U	D7895-FS(0)	1.000	8/23/2023	0.752	2.50	5.00
PFDoA	307-55-1	2.50 U	D7895-FS(0)	1.000	8/23/2023	0.760	2.50	5.00
PFTrDA	72629-94-8	2.50 U	D7895-FS(0)	1.000	8/23/2023	0.742	2.50	5.00
PFTeDA	376-06-7	2.50 U	D7895-FS(0)	1.000	8/23/2023	0.791	2.50	5.00
NMeFOSAA	2355-31-9	2.50 U	D7895-FS(0)	1.000	8/23/2023	1.03	2.50	5.00
NEtFOSAA	2991-50-6	2.50 U	D7895-FS(0)	1.000	8/23/2023	0.990	2.50	5.00
PFBS	375-73-5	2.50 U	D7895-FS(0)	1.000	8/23/2023	0.866	2.50	5.00
PFHxS	355-46-4	2.50 U	D7895-FS(0)	1.000	8/23/2023	0.997	2.50	5.00
PFOS	1763-23-1	2.50 U	D7895-FS(0)	1.000	8/23/2023	1.07	2.50	5.00
HFPO-DA	13252-13-6	2.50 U	D7895-FS(0)	1.000	8/23/2023	0.865	2.50	5.00
Adona	919005-14-4	2.50 U	D7895-FS(0)	1.000	8/23/2023	0.869	2.50	5.00
9Cl-PF3ONS	756426-58-1	2.50 U	D7895-FS(0)	1.000	8/23/2023	1.03	2.50	5.00
11Cl-PF3OUdS	763051-92-9	2.50 U	D7895-FS(0)	1.000	8/23/2023	0.901	2.50	5.00

NW 9/10/23

Analyzed by: Harnden, Kelsey
Printed: 8/23/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-MW08-0823
Battelle ID	D7896-FS
Sample Type	SA
Collection Date	08/15/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.274
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	8.96	D7896-FS(0)	1.000	8/23/2023	0.833	2.28	4.56
PFHpA	375-85-9	4.53 J	D7896-FS(0)	1.000	8/23/2023	0.859	2.28	4.56
PFOA	335-67-1	11.6	D7896-FS(0)	1.000	8/23/2023	0.922	2.28	4.56
PFNA	375-95-1	2.28 U	D7896-FS(0)	1.000	8/23/2023	0.760	2.28	4.56
PFDA	335-76-2	2.28 U	D7896-FS(0)	1.000	8/23/2023	0.715	2.28	4.56
PFUnA	2058-94-8	2.28 U	D7896-FS(0)	1.000	8/23/2023	0.686	2.28	4.56
PFDoA	307-55-1	2.28 U	D7896-FS(0)	1.000	8/23/2023	0.693	2.28	4.56
PFTrDA	72629-94-8	2.28 U	D7896-FS(0)	1.000	8/23/2023	0.677	2.28	4.56
PFTeDA	376-06-7	2.28 U	D7896-FS(0)	1.000	8/23/2023	0.722	2.28	4.56
NMeFOSAA	2355-31-9	2.28 U	D7896-FS(0)	1.000	8/23/2023	0.940	2.28	4.56
NEtFOSAA	2991-50-6	2.28 U	D7896-FS(0)	1.000	8/23/2023	0.903	2.28	4.56
PFBS	375-73-5	2.11 J	D7896-FS(0)	1.000	8/23/2023	0.790	2.28	4.56
PFHxS	355-46-4	4.10 J	D7896-FS(0)	1.000	8/23/2023	0.910	2.28	4.56
PFOS	1763-23-1	2.28 U	D7896-FS(0)	1.000	8/23/2023	0.976	2.28	4.56
HFPO-DA	13252-13-6	2.28 U	D7896-FS(0)	1.000	8/23/2023	0.789	2.28	4.56
Adona	919005-14-4	2.28 U	D7896-FS(0)	1.000	8/23/2023	0.793	2.28	4.56
9Cl-PF3ONS	756426-58-1	2.28 U	D7896-FS(0)	1.000	8/23/2023	0.940	2.28	4.56
11Cl-PF3OUdS	763051-92-9	2.28 U	D7896-FS(0)	1.000	8/23/2023	0.822	2.28	4.56

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-MW07-0823
Battelle ID	D7897-F5
Sample Type	SA
Collection Date	08/15/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.263
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	6.38	D7897-FS(0)	1.000	8/23/2023	0.868	2.38	4.75
PFHpA	375-85-9	3.52 J	D7897-FS(0)	1.000	8/23/2023	0.894	2.38	4.75
PFOA	335-67-1	8.69	D7897-FS(0)	1.000	8/23/2023	0.960	2.38	4.75
PFNA	375-95-1	2.38 U	D7897-FS(0)	1.000	8/23/2023	0.792	2.38	4.75
PFDA	335-76-2	2.38 U	D7897-FS(0)	1.000	8/23/2023	0.745	2.38	4.75
PFUnA	2058-94-8	2.38 U	D7897-FS(0)	1.000	8/23/2023	0.715	2.38	4.75
PFDoA	307-55-1	2.38 U	D7897-FS(0)	1.000	8/23/2023	0.722	2.38	4.75
PFTrDA	72629-94-8	2.38 U	D7897-FS(0)	1.000	8/23/2023	0.705	2.38	4.75
PFTeDA	376-06-7	2.38 U	D7897-FS(0)	1.000	8/23/2023	0.752	2.38	4.75
NMeFOSAA	2355-31-9	2.38 U	D7897-FS(0)	1.000	8/23/2023	0.979	2.38	4.75
NEtFOSAA	2991-50-6	2.38 U	D7897-FS(0)	1.000	8/23/2023	0.941	2.38	4.75
PFBS	375-73-5	1.67 J	D7897-FS(0)	1.000	8/23/2023	0.823	2.38	4.75
PFHxS	355-46-4	6.30	D7897-FS(0)	1.000	8/23/2023	0.948	2.38	4.75
PFOS	1763-23-1	2.38 U	D7897-FS(0)	1.000	8/23/2023	1.02	2.38	4.75
HFPO-DA	13252-13-6	2.38 U	D7897-FS(0)	1.000	8/23/2023	0.822	2.38	4.75
Adona	919005-14-4	2.38 U	D7897-FS(0)	1.000	8/23/2023	0.826	2.38	4.75
9Cl-PF3ONS	756426-58-1	2.38 U	D7897-FS(0)	1.000	8/23/2023	0.979	2.38	4.75
11Cl-PF3OUdS	763051-92-9	2.38 U	D7897-FS(0)	1.000	8/23/2023	0.856	2.38	4.75

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9

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-EB01-081523
Battelle ID	D7898-FS
Sample Type	SA
Collection Date	08/15/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.287
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.795	2.18	4.36
PFHpA	375-85-9	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.820	2.18	4.36
PFOA	335-67-1	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.880	2.18	4.36
PFNA	375-95-1	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.726	2.18	4.36
PFDA	335-76-2	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.683	2.18	4.36
PFUnA	2058-94-8	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.655	2.18	4.36
PFDoA	307-55-1	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.662	2.18	4.36
PFTrDA	72629-94-8	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.646	2.18	4.36
PFTeDA	376-06-7	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.689	2.18	4.36
NMeFOSAA	2355-31-9	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.897	2.18	4.36
NEtFOSAA	2991-50-6	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.862	2.18	4.36
PFBS	375-73-5	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.754	2.18	4.36
PFHxS	355-46-4	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.868	2.18	4.36
PFOS	1763-23-1	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.932	2.18	4.36
HFPO-DA	13252-13-6	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.753	2.18	4.36
Adona	919005-14-4	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.757	2.18	4.36
9Cl-PF3ONS	756426-58-1	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.897	2.18	4.36
11Cl-PF3OUdS	763051-92-9	2.18 U	D7898-FS(0)	1.000	8/23/2023	0.785	2.18	4.36

AW 9/10/23
Analyzed by: Harnden, Kelsey
Printed: 8/23/2023

Isotope Dilution

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10

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-MW09-0823
Battelle ID	D7899-FS
Sample Type	SA
Collection Date	08/14/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.278
Size Unit Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	4.68	D7899-FS(0)	1.000	8/23/2023	0.821	2.25	4.50
PFHpA	375-85-9	3.13 J	D7899-FS(0)	1.000	8/23/2023	0.846	2.25	4.50
PFOA	335-67-1	7.92	D7899-FS(0)	1.000	8/23/2023	0.908	2.25	4.50
PFNA	375-95-1	2.25 U	D7899-FS(0)	1.000	8/23/2023	0.749	2.25	4.50
PFDA	335-76-2	2.25 U	D7899-FS(0)	1.000	8/23/2023	0.705	2.25	4.50
PFUnA	2058-94-8	2.25 U	D7899-FS(0)	1.000	8/23/2023	0.676	2.25	4.50
PFDoA	307-55-1	2.25 U	D7899-FS(0)	1.000	8/23/2023	0.683	2.25	4.50
PFTrDA	72629-94-8	2.25 U	D7899-FS(0)	1.000	8/23/2023	0.667	2.25	4.50
PFTeDA	376-06-7	2.25 U	D7899-FS(0)	1.000	8/23/2023	0.711	2.25	4.50
NMeFOSAA	2355-31-9	2.25 U	D7899-FS(0)	1.000	8/23/2023	0.926	2.25	4.50
NEtFOSAA	2991-50-6	2.25 U	D7899-FS(0)	1.000	8/23/2023	0.890	2.25	4.50
PFBS	375-73-5	1.27 J	D7899-FS(0)	1.000	8/23/2023	0.779	2.25	4.50
PFHxS	355-46-4	3.54 J	D7899-FS(0)	1.000	8/23/2023	0.897	2.25	4.50
PFOS	1763-23-1	2.25 U	D7899-FS(0)	1.000	8/23/2023	0.962	2.25	4.50
HFPO-DA	13252-13-6	2.25 U	D7899-FS(0)	1.000	8/23/2023	0.778	2.25	4.50
Adona	919005-14-4	2.25 U	D7899-FS(0)	1.000	8/23/2023	0.781	2.25	4.50
9Cl-PF3ONS	756426-58-1	2.25 U	D7899-FS(0)	1.000	8/23/2023	0.926	2.25	4.50
11Cl-PF3OUdS	763051-92-9	2.25 U	D7899-FS(0)	1.000	8/23/2023	0.810	2.25	4.50

NW 9/10/23

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAVAL BASE KITSAP KEYPORT, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 23-1035
Laboratory: Battelle Norwell Operations, Norwell, Massachusetts
Site: Northwest PFAS Investigation, Naval Base Kitsap (NBK) Keyport, WA, CTO-4117
Date: September 10, 2023

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	NBKK-B76-SS07-0001	D7883-FS	Soil
1MS	NBKK-B76-SS07-0001MS	D7884-FSMS	Soil
1MSD	NBKK-B76-SS07-0001MSD	D7885-FSMSD	Soil
2	NBKK-B76-SB07-2223	D7886-FS	Soil
3	NBKK-B76-SB07-1516	D7887-FS	Soil
4	NBKK-B76-SB08-2425	D7889-FS	Soil
5	NBKK-B76-SB09-1920	D7890-FS	Soil
6	NBKK-B76-SB06-2325	D7891-FS	Soil
7	NBKK-B76-SB06-0910	D7892-FS	Soil

A Stage 2B/4 data validation was performed on the analytical data for seven soil samples collected on August 9-11, 2023 by CH2M HILL at the NBK Keyport site in Washington. The samples were analyzed under the Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Specific method references are as follows:

Analysis	*Method References*
PFAS	Battelle SOP 5-369-09

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Draft Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Base Kitsap Keyport, Washington, August 2022, the DoD Final General Data Validation Guidelines, November 2019, including the following Module:

- The Department of Defense (DoD) Data Validation Guidelines Module 3, Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories (QSM) Table B-15, May 2020;
- The Department of Defense (DoD) Data Validation Guidelines Module 1, 2, 3, and 4 Revised Table for Sample Qualification in the Presence of Blank Contamination, February 2022;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

PFAS

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Laboratory Fortified Blank (LFB)
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A Stage 2B/4 data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Polyfluoroalkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All holding time criteria were met.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent recovery (%R) criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample results are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
NBKK-B76-EB01-081023	None - ND	-	-	-
NBKK-B76-EB01-081123	PFDA	0.765	None	All Associated ND
NBKK-B76-EB01-080923	None - ND	-	-	-
NBKK-B76-EB02-080923	None - ND	-	-	-
NBKK-B76-FB01-081123	PFHxA	0.917	None	All Associated ND
	PFDA	0.964		
	11C1-PF3OUdS	1.56		

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Laboratory Control Sample (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 9/11/23

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SS07-0001
Battelle ID	D7883-FS
Sample Type	SA
Collection Date	08/10/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	14.35
Matrix	SOIL
Sample Size	5.030
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.177	0.497	0.994
PFHpA	375-85-9	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.167	0.497	0.994
PFOA	335-67-1	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.213	0.497	0.994
PFNA	375-95-1	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.156	0.497	0.994
PFDA	335-76-2	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.157	0.497	0.994
PFUnA	2058-94-8	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.155	0.497	0.994
PFDoA	307-55-1	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.159	0.497	0.994
PFTrDA	72629-94-8	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.160	0.497	0.994
PFTeDA	376-06-7	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.161	0.497	1.99
NMeFOSAA	2355-31-9	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.158	0.497	1.99
NEtFOSAA	2991-50-6	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.164	0.497	1.99
PFBS	375-73-5	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.170	0.497	0.994
PFHxS	355-46-4	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.172	0.497	0.994
PFOS	1763-23-1	0.431 J	D7883-FS(0)	1.000	8/23/2023	0.174	0.497	0.994
HFPO-DA	13252-13-6	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.158	0.497	1.99
Adona	919005-14-4	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.159	0.497	1.99
9Cl-PF3ONS	756426-58-1	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.153	0.497	1.99
11Cl-PF3OUdS	763051-92-9	0.497 U	D7883-FS(0)	1.000	8/23/2023	0.149	0.497	1.99

NW 9/10/23

Analyzed by: Harnden, Kelsey
Printed: 8/24/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

2

Client ID	NBKK-B76-SB07-2223
Battelle ID	D7886-FS
Sample Type	SA
Collection Date	08/10/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	6.87
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.173	0.499	0.998
PFOS	1763-23-1	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	D7886-FS(0)	1.000	8/23/2023	0.150	0.499	2.00

MW 9/20/23

Analyzed by: Harnden, Kelsey
Printed: 8/24/2023

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

3

Client ID	NBKK-B76-SB07-1516
Battelle ID	D7887-FS
Sample Type	SA
Collection Date	08/10/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	8.65
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.173	0.500	1.00
PFOS	1763-23-1	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	D7887-FS(0)	1.000	8/23/2023	0.150	0.500	2.00

MW 9/10/23

Isotope Dilution

Analyzed by: Harnden, Kelsey
Printed: 8/24/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

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Client ID	NBKK-B76-SB08-2425
Battelle ID	D7889-FS
Sample Type	SA
Collection Date	08/10/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	6.37
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.173	0.499	0.998
PFOS	1763-23-1	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	D7889-FS(0)	1.000	8/23/2023	0.150	0.499	2.00

MW 9/10/23

Analyzed by: Harnden, Kelsey
Printed: 8/24/2023

Isotope Dilution

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

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Client ID	NBKK-876-5809-1920
Battelle ID	D7890-FS
Sample Type	SA
Collection Date	08/09/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	9.65
Matrix	SOIL
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.173	0.499	0.998
PFOS	1763-23-1	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	D7890-FS(0)	1.000	8/23/2023	0.150	0.499	2.00

MW 9/10/23

Analyzed by: Harnden, Kelsey
Printed: 8/24/2023

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6

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB06-2325
Battelle ID	D7891-FS
Sample Type	SA
Collection Date	08/11/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	7.52
Matrix	SOIL
Sample Size	5.040
Size Unit Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.177	0.496	0.992
PFHpA	375-85-9	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.167	0.496	0.992
PFOA	335-67-1	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.212	0.496	0.992
PFNA	375-95-1	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.156	0.496	0.992
PFDA	335-76-2	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.157	0.496	0.992
PFUnA	2058-94-8	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.155	0.496	0.992
PFDoA	307-55-1	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.159	0.496	0.992
PFTrDA	72629-94-8	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.160	0.496	0.992
PFTeDA	376-06-7	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.161	0.496	1.98
NMeFOSAA	2355-31-9	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.158	0.496	1.98
NEtFOSAA	2991-50-6	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.164	0.496	1.98
PFBS	375-73-5	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.170	0.496	0.992
PFHxS	355-46-4	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.172	0.496	0.992
PFOS	1763-23-1	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.174	0.496	0.992
HFPO-DA	13252-13-6	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.158	0.496	1.98
Adona	919005-14-4	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.159	0.496	1.98
9Cl-PF3ONS	756426-58-1	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.153	0.496	1.98
11Cl-PF3OUdS	763051-92-9	0.496 U	D7891-FS(0)	1.000	8/23/2023	0.149	0.496	1.98

MW 9/10/23

Isotope Dilution

Analyzed by: Harnden, Kelsey
Printed: 8/24/2023

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7

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-SB06-0910
Battelle ID	D7892-FS
Sample Type	SA
Collection Date	08/11/2023
Extraction Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	8.61
Matrix	SOIL
Sample Size	5.040
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.177	0.496	0.992
PFHpA	375-85-9	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.167	0.496	0.992
PFOA	335-67-1	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.212	0.496	0.992
PFNA	375-95-1	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.156	0.496	0.992
PFDA	335-76-2	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.157	0.496	0.992
PFUnA	2058-94-8	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.155	0.496	0.992
PFDoA	307-55-1	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.159	0.496	0.992
PFTrDA	72629-94-8	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.160	0.496	0.992
PFTeDA	376-06-7	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.161	0.496	1.98
NMeFOSAA	2355-31-9	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.158	0.496	1.98
NEtFOSAA	2991-50-6	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.164	0.496	1.98
PFBS	375-73-5	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.170	0.496	0.992
PFHxS	355-46-4	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.172	0.496	0.992
PFOS	1763-23-1	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.174	0.496	0.992
HFPO-DA	13252-13-6	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.158	0.496	1.98
Adona	919005-14-4	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.159	0.496	1.98
9Cl-PF3ONS	756426-58-1	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.153	0.496	1.98
11Cl-PF3OUdS	763051-92-9	0.496 U	D7892-FS(0)	1.000	8/23/2023	0.149	0.496	1.98

MW 9/10/23

Isotope Dilution

Analyzed by: Harnden, Kelsey
Printed: 8/24/2023

Appendix K
Data Quality Assessment Report

Data Quality Assessment, Per- and Polyfluoroalkyl Substances Naval Base Kitsap Keyport Keyport, Washington

Date: October 2023

Introduction

The purpose of this technical memorandum is to present the results of the data validation process for the soil and water samples collected from August through December 2022 and August 2023.

Soil and water samples were submitted to Battelle Laboratories for PFAS analysis by analytical method Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS) compliant with Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.3 Table B-15 (DoD, 2019).

The sample results were validated by Environmental Data Services, Inc. (EDS) for compliance with the guidance documents *General Data Validation Guidelines (*DoD, 2019*)*, *Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories Table B-15* (DoD, 2020), the *Data Validation Guidelines Module 1, 2 and 4 Revised Blank Qualification Table* (DoD, 2022), the *Final Sampling and Analysis Plan Site Inspection for Per- and Polyfluoroalkyl Substances, Naval Kitsap Keyport, Keyport, Washington* (CH2M, 2022) and professional judgment.

The data validation findings for the following sample delivery groups (SDGs) were reviewed by Jacobs for this data quality assessment:

SDGs		
22-1551	22-1801	22-2030
22-1552	22-1835	22-2031
22-1579	22-1836	22-2046
22-1721	22-1925	22-2063
22-1722	22-1926	22-2064
22-1766	22-1944	22-2154
22-1767	22-1946	22-2184
22-1800	22-1986	23-0997
23-0998	23-1033	23-1035

During data validation, EDS assigned qualifying flags to sample results for associated quality assurance/quality control (QA/QC) results outside of acceptance criteria, as specified in the guidance documents. This qualification also included the use of secondary qualifier flags. The secondary qualifiers provide the reasoning behind the assignment of a qualifier to these data. The data quality assessment evaluated the data validation findings against PARCCS criteria (precision, accuracy, representativeness, comparability, completeness, and sensitivity) as qualitative and quantitative indicators of data quality. The findings are documented within the appropriate criteria sections below.

The definitions of the primary qualifiers are presented below. The secondary qualifiers are listed in **Attachment 1**.

Validation Flag Definitions

The following primary qualifiers were used to qualify the data:

[NULL]: **Detected.** The analyte was analyzed for and detected at the concentration shown.

[J]: **Estimated.** The reported result was an estimated value with an unknown bias.

[U]: **Undetected.** The analyte was not detected and was reported as less than the limit of detection (LOD) or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.

[UJ]: **Detection limit estimated.** The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.

[X]: **Recommended for Rejection.** The data should be evaluated further by the project team, but are recommended for rejection due to serious QA/QC deficiencies.

[Exclude]: **Excluded.** Data were not used due to another value being more appropriate.

Quality Control Measures

The following list represents the QA/QC measures that were reviewed during the data quality evaluation procedure:

- **Holding Times:** The holding times are evaluated to verify that samples were extracted and analyzed within holding times.
- **Blank samples:** Method blank, equipment blank, and trip blank samples were provided for this project. Blank samples enable the reviewer to determine if an analyte may be attributed to sampling or laboratory procedures, rather than environmental contamination from site activities.
- **Lab Control Sample (LCS)/Lab Control Sample Duplicate (LCSD):** These samples are a "controlled matrix", laboratory reagent water, in which target compounds have been added prior to extraction/analysis. The recoveries serve as a monitor of the overall performance of each step during the analysis, including sample preparation.
- **Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples:** Spike recovery is used to evaluate potential matrix interferences, as well as accuracy. Precision information is also determined by calculating the reproducibility between the recoveries of each spiked parameter.
- **Field Duplicate/Triplicate Samples:** These samples are collected to determine the precision between a native and its duplicates. This information can only be determined when target compounds are detected.
- **Ion Ratio**: Ion ratios can be used to help determine if the matrix of the sample has resulted in a bias in the data. To determine if a bias has potentially occurred, the ion ratio is evaluated against the ion ratio of standards, which do not contain matrix interferences. Ion ratio failures could be caused by matrix interference and/or be the result of the presence of isomers in the sample at different ratios than the ratio of isomers present in the calibration standards.
- **Extracted Internal Standard (EIS) Recovery**: These recoveries are used to correct for bias associated with matrix interferences and sample preparation efficiencies, injection volume variances, chromatographic behavior, and mass spectrometry ionization efficiency.
- **Internal Standards:** These are compounds added to the sample extracts prior to analysis. Their retention times and response are evaluated for method compliance. The internal standards are used in the quantification of the target parameters and to monitor the instrument sensitivity and response for stability during analysis.

- **Initial Calibration:** The initial calibration ensures the instrument is capable of producing acceptable qualitative and quantitative data for the compounds of interest. Multiple standard solutions are analyzed to determine the response and linearity of the instrument over a varying concentration range.
- **Continuing Calibration:** The continuing calibration checks the satisfactory performance of the instrument and its predicted response to the target compounds by analysis of a standard solution(s) at known concentrations.

PARCCS Review

Evaluation of the PARCCS criteria for all samples is discussed below.

Precision

Precision is defined as the agreement between duplicate results and was calculated as relative percent difference (RPD) by comparing duplicate MS/MSD and LCS/LCSD recoveries and field duplicate sample results.

MS/MSD and LCS/LCSD

MS/MSD and LCS/LCSD RPDs met acceptance criteria with no results qualified for high RPD.

Field Duplicates

Field duplicate precision met acceptance criteria with no results qualified for high RPD.

Accuracy

Accuracy is a measure of the agreement between an experimental determination and the true value of the parameter being measured. For organic analyses, each sample was spiked with EIS compounds. Additionally, an MS/MSD and LCS were spiked with a known parameter concentration before preparation. Internal standards also provide a measure of accuracy. EIS, MS/MSD, and internal standards provide a measure of the matrix effects on analytical accuracy. The LCS demonstrates the accuracy of the method and the laboratory's ability to meet the method criteria. Accuracy is also assessed by calibration responses. Potential biases and trends were evaluated by first determining whether a QA/QC exceedance may indicate a potential bias or trend. If so, then the exceedance was examined to determine whether the bias or trend was significant enough to warrant the rejection of data.

MS, MSD, LCS, LCSD

MS/MSD and LCS/LCSD recoveries generally met acceptance criteria with one PFBS record qualified for low recovery in the MS and several PFTeDA records qualified for low recovery in the LCS. Because the PFBS result is less than the screening level the potential high bias does not impact the usability of the data. PFTeDA currently doesn't have a screening level and the potential bias doesn't impact the usability of the results. None of the remaining results were qualified for percent recoveries outside of SAP specified criteria. Affected data are summarized in **Attachment 2**.

Extracted Internal Standards (EIS)

The EIS recoveries for various PFAS compounds in several samples were below acceptance criteria. Because many of the results were either not detected or significantly below the screening level, if applicable, the high bias is not interpreted to impact the usability of the data. The remaining recoveries met acceptance criteria with no results qualified for percent recoveries outside of SAP specified criteria. Affected data are summarized in **Attachment 2**.

Internal Standards

The IS recoveries for various PFAS compounds in several soil and groundwater samples were outside of SAP-specified acceptance criteria. Because many of the results were either not detected or significantly different than

the screening level, if applicable, the potential bias is not interpreted to impact the usability of the data. The remaining recoveries met acceptance criteria with no results qualified for percent recoveries outside of SAP specified criteria. Affected data are summarized in **Attachment 2**.

Ion Ratios

The ion ratios for PFHxS and PFHxA were outside of SAP-specified criteria for several samples. For PFHxS, the concentrations were either not detected or significantly less than the screening level and the potential bias is does not impact the usability of the data. There is currently no screening level for PFHxA and the potential bias doesn't impact the usability of the results as reported.

Affected data are summarized and qualified 'OT' in **Attachment 2**.

Analytical and Laboratory Blanks

No target analytes were detected in the analytical and laboratory blanks.

Calibration

All acceptance criteria were met.

Representativeness

Representativeness is a qualitative measure of the degree to which sample data accurately and precisely represent a characteristic environmental condition (e.g., nature and extent of contamination). Representativeness is a subjective parameter and is used to evaluate the efficacy of the sample planning design. In terms of data quality, representativeness was assured because the sampling team followed approved standard operating procedures (SOPs) for sample collection and handling, and the laboratory followed approved SOPs for sample handling, preparation, and analysis.

Holding Times

All holding time requirements were met.

Completeness

Completeness is defined as the percentage of measurements that are judged to be valid; validity being defined by the data quality objectives (DQOs). Therefore, completeness is calculated as the number of analytically sound results that are available for use compared to the total number of measurements made. The National Functional Guidelines data validation guidance designates all results except those R-qualified as "rejected" to be available for use as analytically sound results. The R-qualifier is the only qualifier that negatively affects a data point's availability. The data set is 100% complete and the completeness goal of 95% was exceeded.

Comparability

Comparability is another qualitative measure designed to express the confidence with which one data set may be compared to another. Factors that affect comparability are sample collection and handling techniques, sample matrix, and analytical methods. In this case, because approved SOPs were used for sample collection and handling, common sample matrices were evaluated, and adherence to the DoD QSM version 5.3 was followed, the data user may express confidence in the fact that this data set is comparable to others of acceptable data quality. Comparability is controlled by the other PARCCS parameters because data sets can be compared with confidence only when precision and accuracy are known. Precision and accuracy were demonstrated to be acceptable, and the data user may be confident that this data set is comparable to others of high data quality.

The recalculation of the laboratory quantitation was performed at a 10% frequency as per the statement of work with no anomalies found. The assumptions made about the PARCCS were proper and correct. No error in

judgment was found during this review of the data validation reports, which are included as Appendix J to the SI report.

Sensitivity

Sensitivity is the ability of an analytical method or instrument to discriminate between measurement responses representing different concentrations. This capability is established during the planning phase to meet project-specific objectives. It is important to be able to detect the target analytes at the levels of interest. Sensitivity requirements include the establishment of various limits such as calibration requirements, instrument LODs, and limit of quantitations (LOQs). No limits were raised above the screening levels.

Conclusion

A review of the analytical data submitted regarding the Naval Base Kitsap Keyport sampling event from August through December 2022 has been completed. The validation review demonstrated that the analytical systems were generally in control and that all the data results can be used in the project decision-making process.

References

Department of Defense (DoD). 2019. *DoD Final General Data Validation Guidelines*. November.

Department of Defense (DoD). 2020. Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual for Environmental Laboratories Table B-15. May.

DoD. 2022. Data Validation Guidelines Modules 1,2, 3, and 4 Revised Table for Sample Qualification in the Presence of Blank Contamination.

CH2M. 2022. Final Sampling and Analysis Plan Site Inspection for Per- and Polyfluroalkyl Substances, Naval Base Kitsap Keyport, Keyport, Washington. August.

Attachment 1
Secondary Data Qualifier Codes

Attachment 1. Secondary Data Qualifier, or Validation Reason, Codes

Secondary Data Qualifier	Description
%SOL	High Moisture content
2C	Second Column – Poor Dual Column Reproducibility
2S	Second Source – Bad reproducibility between tandem detectors
BD	Blank Spike/Blank Spike Duplicate (LCS/LCSD) Precision
BRL	Below Reporting Limit
BSH	Blank Spike/LCS – High Recovery
BSL	Blank Spike/LCS – Low Recovery
CC	Continuing Calibration
CCBL	Continuing Calibration Blank Contamination
CCH	Continuing Calibration Verification – High Recovery
CCL	Continuing Calibration Verification – Low Recovery
DL	Redundant Result – due to Dilution
EBL	Equipment Blank Contamination
EMPC	Estimated Possible Maximum Concentration
ESH	Extraction Standard - High Recovery
ESL	Extraction Standard - Low Recovery
FBL	Field Blank Contamination
FD	Field Duplicate
GBL	Grinding Blank Contamination
GBSH	Ground Blank Spike/LCS – High Recovery
GBSL	Ground Blank Spike/LCS – Low Recovery
HT	Holding Time
ICB	Initial Calibration – Bad Linearity or Curve Function
ICH	Initial Calibration – High Relative Response Factors
ICL	Initial Calibration – Low Relative Response Factors
IR15	Ion ratio exceeds +/- 15% difference
ISH	Internal Standard – High Recovery
ISL	Internal Standard – Low Recovery
LD	Lab Duplicate Reproducibility
LR	Concentration Exceeds Linear Range
MBL	Method Blank Contamination
MDP	Matrix Spike/Matrix Spike Duplicate Precision
MI	Matrix interference obscuring the raw data
MSH	Matrix Spike and/or Matrix Spike Duplicate – High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate – Low Recovery
OT	Other

Attachment 1. Secondary Data Qualifier, or Validation Reason, Codes

Secondary Data Qualifier	Description
PD	Pesticide Degradation
RE	Redundant Result - due to Reanalysis or Re-extraction
SD	Serial Dilution Reproducibility
SSH	Extracted Internal Stds (EIS) – High Recovery
SSL	Extracted Internal Stds (EIS) – Low Recovery
TBL	Trip Blank Contamination
TN	Tune

Attachment 2
Assigned Qualifiers

Attachment 2. Assigned Qualifiers.

Sample ID	Sample Type	Analyte	Lab Result	Lab Qual	Final Result	Primary Qualifier	Units	Secondary Qualifier
NBKK-B1006-SS05-0001	N	Perfluoroundecanoic Acid (PFUnA)	5.62		5.62	J	NG_G	SSL
NBKK-B1006-SB01-0102	N	N-Ethyl Perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	0.5	U	0.5	UJ	NG_G	SSL
NBKK-B1006-SB02-0102	N	N-Ethyl Perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	0.5	U	0.5	UJ	NG_G	SSL
NBKK-B76-SB05-0304	N	Perfluorooctane Sulfonate (PFOS)	4.96		4.96	J	NG_G	ISH
NBKK-LFEX-SB03-1718	N	Perfluorotridecanoic Acid (PFTrDA)	0.499	U	0.499	UJ	NG_G	SSL
NBKK-LFEX-SB03-1718	N	Perfluorotetradecanoic Acid (PFTeDA)	0.499	U	0.499	UJ	NG_G	SSL
NBKK-LFEX-SB01-2728	N	Perfluorotridecanoic Acid (PFTrDA)	0.5	U	0.5	UJ	NG_G	SSL
NBKK-LFEX-SB01-2728	N	Perfluorotetradecanoic Acid (PFTeDA)	0.5	U	0.5	UJ	NG_G	SSL
NBKK-LFEX-SB04-2627	N	Perfluorotridecanoic Acid (PFTrDA)	0.501	U	0.501	UJ	NG_G	SSL
NBKK-LFEX-SB04-2627	N	Perfluorotetradecanoic Acid (PFTeDA)	0.501	U	0.501	UJ	NG_G	SSL
NBKK-OU2A5-SB05-0203	N	Perfluorotridecanoic Acid (PFTrDA)	0.5	U	0.5	UJ	NG_G	SSL
NBKK-OU2A5-SB05-0203	N	Perfluorotetradecanoic Acid (PFTeDA)	0.5	U	0.5	UJ	NG_G	SSL
NBKK-OU2A5-SB04-0203	N	Perfluorododecanoic Acid (PFDoA)	0.499	U	0.499	UJ	NG_G	SSL
NBKK-OU2A5-SB04-0203	N	Perfluorotridecanoic Acid (PFTrDA)	0.499	U	0.499	UJ	NG_G	SSL
NBKK-OU2A5-SB04-0203	N	Perfluorotetradecanoic Acid (PFTeDA)	0.499	U	0.499	UJ	NG_G	SSL
NBKK-OU2A5-SB04-0203	N	N-Methyl Perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	0.499	U	0.499	UJ	NG_G	SSL
NBKK-OU2A5-SB04-0203	N	N-Ethyl Perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	0.499	U	0.499	UJ	NG_G	SSL
NBKK-OU2A5-MW01-1222	N	Perfluorotetradecanoic Acid (PFTeDA)	2.37	U	2.37	UJ	NG_L	BSL
NBKK-OU2A5-MW03-1222	N	Perfluorotetradecanoic Acid (PFTeDA)	2.25	U	2.25	UJ	NG_L	BSL
NBKK-S7-MW02-1222	N	Perfluorotetradecanoic Acid (PFTeDA)	2.29	U	2.29	UJ	NG_L	BSL
NBKK-S7-MW02-1222	N	Perfluorobutanesulfonic acid (PFBS)	2.29	UT	2.29	UJ	NG_L	MSL
NBKK-S7-MW05-1222	N	Perfluorotetradecanoic Acid (PFTeDA)	2.25	U	2.25	UJ	NG_L	BSL
NBKK-S7-MW05P-1222	FD	Perfluorotetradecanoic Acid (PFTeDA)	2.29	U	2.29	UJ	NG_L	BSL
NBKK-S7-MW04-1222	N	Perfluorotetradecanoic Acid (PFTeDA)	2.39	U	2.39	UJ	NG_L	BSL
NBKK-S7-MW01-1222	N	Perfluorotetradecanoic Acid (PFTeDA)	2.29	U	2.29	UJ	NG_L	BSL
NBKK-LFEX-MW02-1122	N	Perfluorotridecanoic Acid (PFTrDA)	2.23	U	2.23	UJ	NG_L	SSL

Attachment 2. Assigned Qualifiers.

Sample ID	Sample Type	Analyte	Lab Result	Lab Qual	Final Result	Primary Qualifier	Units	Secondary Qualifier
NBKK-LFEX-MW02-1122	N	Perfluorotetradecanoic Acid (PFTeDA)	2.23	U	2.23	UJ	NG_L	SSL
NBKK-LFEX-MW01-1122	N	Perfluorotridecanoic Acid (PFTrDA)	2.41	U	2.41	UJ	NG_L	SSL
NBKK-LFEX-MW01-1122	N	Perfluorotetradecanoic Acid (PFTeDA)	2.41	U	2.41	UJ	NG_L	SSL
NBKK-B1006-MW03-1122	N	Perfluorohexanesulfonic acid (PFHxS)	9.85	Q	9.85	J	NG_L	OT
NBKK-OU2A2-SD03-0004	N	Perfluorotridecanoic Acid (PFTrDA)	1.15	U	1.15	UJ	NG_G	SSL
NBKK-OU2A2-SD03-0004	N	Perfluorotetradecanoic Acid (PFTeDA)	1.15	U	1.15	UJ	NG_G	SSL
NBKK-OU2A2-MW2-8-1222	N	Perfluorohexanoic Acid (PFHxA)	18.3		18.3	J	NG_L	ISL
NBKK-OU2A2-MW2-8-1222	N	Perfluoroheptanoic acid (PFHpA)	10.8		10.8	J	NG_L	ISL
NBKK-OU2A2-MW2-8-1222	N	Perfluorooctanoic acid (PFOA)	358		358	J	NG_L	ISL
NBKK-OU2A2-MW2-8-1222	N	Perfluorononanoic acid (PFNA)	5.69	Q	5.69	J	NG_L	ISL
NBKK-OU2A2-MW2-8-1222	N	Perfluoro-2-methyl-3-oxahexanoic acid (HFPO-DA)	2.51	U	2.51	UJ	NG_L	ISL
NBKK-OU2A2-MW2-8-1222	N	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	2.51	U	2.51	UJ	NG_L	ISL
NBKK-OU2A2-MW2-8-1222	N	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	2.51	U	2.51	UJ	NG_L	ISL
NBKK-OU2A2-MW2-8-1222	N	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	2.51	U	2.51	UJ	NG_L	ISL
NBKK-OU2A2-MW2-8P-1222	FD	Perfluorohexanoic Acid (PFHxA)	21.1		21.1	J	NG_L	ISL
NBKK-OU2A2-MW2-8P-1222	FD	Perfluoroheptanoic acid (PFHpA)	8.98		8.98	J	NG_L	ISL
NBKK-OU2A2-MW2-8P-1222	FD	Perfluorooctanoic acid (PFOA)	330		330	J	NG_L	ISL
NBKK-OU2A2-MW2-8P-1222	FD	Perfluorononanoic acid (PFNA)	7.85		7.85	J	NG_L	ISL
NBKK-OU2A2-MW2-8P-1222	FD	Perfluoro-2-methyl-3-oxahexanoic acid (HFPO-DA)	2.36	U	2.36	UJ	NG_L	ISL
NBKK-OU2A2-MW2-8P-1222	FD	4,8-dioxa-3H-perfluorononanoic acid (ADONA)	2.36	U	2.36	UJ	NG_L	ISL
NBKK-OU2A2-MW2-8P-1222	FD	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	2.36	U	2.36	UJ	NG_L	ISL
NBKK-OU2A2-MW2-8P-1222	FD	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	2.36	U	2.36	UJ	NG_L	ISL
NBKK-OU2A2-MW03-1222	N	Perfluorotridecanoic Acid (PFTrDA)	2.37	U	2.37	UJ	NG_L	SSL
NBKK-OU2A2-MW03-1222	N	Perfluorotetradecanoic Acid (PFTeDA)	2.37	U	2.37	UJ	NG_L	SSL

Attachment 2. Assigned Qualifiers.

Sample ID	Sample Type	Analyte	Lab Result	Lab Qual	Final Result	Primary Qualifier	Units	Secondary Qualifier
NBKK-CF1-MW01-1222	N	Perfluorohexanoic Acid (PFHxA)	5.25	Q	5.25	J	NG_L	OT
NBKK-CF1-MW01-1222	N	Perfluorotridecanoic Acid (PFTrDA)	2.4	U	2.4	UJ	NG_L	SSL
NBKK-CF1-MW01-1222	N	Perfluorotetradecanoic Acid (PFTeDA)	2.4	U	2.4	UJ	NG_L	SSL
NBKK-B1006-MW04-1222	N	Perfluorohexanoic Acid (PFHxA)	6.19	Q	6.19	J	NG_L	OT
NBKK-OU2A2-MW05-1222	N	Perfluorotridecanoic Acid (PFTrDA)	2.39	U	2.39	UJ	NG_L	SSL
NBKK-OU2A2-MW05-1222	N	Perfluorotetradecanoic Acid (PFTeDA)	2.39	U	2.39	UJ	NG_L	SSL
NBKK-OU2A2-MW04-1222	N	Perfluorotridecanoic Acid (PFTrDA)	2.43	U	2.43	UJ	NG_L	SSL
NBKK-OU2A2-MW04-1222	N	Perfluorotetradecanoic Acid (PFTeDA)	2.43	U	2.43	UJ	NG_L	SSL
NBKK-B76-SB12-0103	N	N-Methyl Perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	0.5	U	0.5	UJ	NG_G	SSL
NBKK-B76-SB12-0103	N	N-Ethyl Perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	0.5	U	0.5	UJ	NG_G	SSL

Appendix L
Human Health Risk Screening

APPENDIX L

Human Health Risk Screening

A human health risk screening (HHRS) was performed to assess potential human health risks associated with exposure to per- and polyfluoroalkyl substances (PFAS) in soil and groundwater at Naval Base Kitsap (NBK) Keyport in Keyport, Washington. Potential risks associated with exposure to six PFAS (perfluorobutanesulfonic acid [PFBS], perfluorooctanoic acid [PFOA], perfluorooctane sulfonic acid [PFOS], perfluorohexanesulfonic acid [PFHxS], perfluorononanoic acid [PFNA], and hexafluoropropylene oxide dimer acid [HFPO-DA]) were quantified in the HHRS. As discussed in the Site Investigation (SI), the soil groundwater, and sediment samples were analyzed for additional PFAS.

The Navy acknowledges that there are now RSLs for PFBA and PFHxA in the May 2023 RSL update (USEPA, 2023; DoD, 2023). While PFBA was not analyzed under the SI, it is unlikely to impact site management decisions based on results and concentrations at similar Navy sites. PFHxA was analyzed in the samples. PFHxA was not detected in any sediment samples, and concentrations detected in groundwater and soil samples were below the May 2023 tap water RSL and residential soil RSL, respectively. Therefore, PFHxA concentrations do not impact site management decisions and the HHRS was not updated to include PFHxA at this time. PFHxA will be considered during RI planning and PFBA will be included in the RI analyte list.

The results of the HHRS provide a preliminary indication of potential risks from exposure to PFAS in soil and groundwater at potential release areas and are used to help evaluate whether an area requires further evaluation (that is, potential unacceptable risks are identified for an area). Human health risk-based screening levels based on residential exposure and potable use of groundwater were used for the screening evaluation.

A Preliminary Assessment (PA) for PFAS was conducted at NBK Keyport to identify potential PFAS release areas (CH2M, 2020). Of the 21 areas identified for evaluation, 10 were identified as potential PFAS release areas and 11 were recommended for no further action (NFA). Additionally, four special areas associated with NBK Keyport, but not part of the installation, were recommended for NFA in a technical memo published prior to the PA (CH2M, 2018). Of the 10 potential release areas, two areas were recommended for Remedial Investigation (RI), since PFAS was known to be present at these sites and an SI would not have added additional data. In addition, one of the remaining eight sites was recommended for NFA. Therefore, seven potential release areas were investigated as part of the SI. In addition to soil and groundwater, three sediment samples were collected and analyzed for PFAS as part of the SI. Since the concentrations of the two PFAS detected in at least one of the three sediment samples was below the screening levels, sediment was not evaluated in the HHRS.

The seven potential release areas evaluated in the HHRS are:

- Building 76
- 2008 Car Fire
- Keyport Sludge Disposal Area (OU 2/Area 5)
- Building 1006
- Van Meter Road Spill/ Former Drum Storage Area (OU 2/Area 2)
- Keyport Peninsula Fill (Site 7)
- Landfill Extension (Northeast Portion of Area 22)

Current or future workers, visitors, and trespassers at any of the potential PFAS release areas, or future residents if a potential PFAS release area is developed for future residential use, could be exposed to PFAS in soil through incidental ingestion of, and dermal contact with, surface and/or subsurface soil. There are currently no toxicity values for inhalation of PFAS, and therefore the inhalation of dust from soil is not evaluated in the HHRS. There is some evidence that PFAS may bioaccumulate in terrestrial food items (such as plants), and upper trophic level receptors (such as birds and mammals) could potentially be indirectly exposed to PFAS in soil through the consumption of terrestrial organisms. The ingestion of PFAS and food crops is not evaluated as part of the SI;

however, if a site is identified for further evaluation based on the soil evaluation in the SI and it is determined this is a complete exposure pathway, it may be considered for evaluation during a future investigation.

Groundwater within the lower aquifer is the primary regional drinking water source for NBK Keyport and off-Base in the Town of Keyport. PFAS have not been detected in the lower aquifer (CH2M, 2020). PFAS have been detected in the shallow, upper aquifer; however, no confirmed drinking water sources have been identified that use the shallow, upper aquifer within 1 mile of the identified potential PFAS release sites. If groundwater from the shallow, upper aquifer is used as a future potable water source, future workers or residents could be exposed to PFAS in groundwater through ingestion and dermal contact. Additionally, if depth to groundwater is within about 10 to 12 feet of the ground surface future construction workers could be exposed to PFAS in groundwater through dermal contact.

1 Data Evaluation

Surface soil, subsurface soil, and groundwater samples collected at the potential PFAS source areas from August through December 2022 and August 2023 were evaluated in the HHRS (**Table L-1**). Each medium was evaluated separately for the seven potential source areas. Subsurface soil samples that were collected from depths greater than 15 feet below ground surface were not evaluated in the HHRS. Subsurface soil samples collected from depths up to 15 feet below ground surface are typically evaluated in the HHRS as this is the deepest construction activities are assumed to occur and result in exposure to soil by the construction workers and displacement of this soil and exposure by future receptors (this is consistent with WAC 173-340-740 (6)(d)).

The soil and groundwater PFAS data evaluated in the HHRS were validated. Validation of the data identified the following criteria for data usability:

- Estimated values flagged with a J qualifier were treated as unqualified detected concentrations.
- Values flagged with a U qualifier indicate an analyte was not detected.

For duplicate samples, the maximum concentration between the two samples was used as the sample concentration. If the analyte was only detected in one of the samples, the detected concentration was used as the sample concentration. If the analyte was not detected in either of the samples, the higher detection limit was used as the sample detection limit.

2 Human Health Risk Screening Methodology

The HHRS was conducted in two steps using a risk-ratio technique.

Step 1

Following current Assistant Secretary of Defense guidance (2022), United States Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs) for six PFAS chemicals (PFOA, PFOS, PFBS, PFHxS, PFNA, and HFPO-DA) are used to screen PFAS concentrations in site media. The maximum detected concentrations of these six PFAS in surface soil, subsurface soil, and groundwater in each potential source area were compared to the USEPA RSLs from the November 2022 RSL Table (USEPA, 2022) based on a hazard quotient (HQ) of 0.1. Soil data was compared to residential soil RSLs and groundwater data was compared to tapwater RSLs.

If the maximum detected concentration exceeded the RSL, the chemical was identified as a Step 1 chemical of potential concern (COPC) and evaluated in Step 2.

Step 2

A risk level was calculated for each COPC identified in Step 1.

For potential carcinogenic analytes identified as COPCs in Step 1 (PFOA is the only potential carcinogen evaluated in the HHRS), the carcinogenic risk was calculated using the following equation:

$$\textit{Carcinogenic risk} = \frac{\textit{MDC x target risk level of RSL}}{\textit{RSL}}$$

Where:

MDC = maximum detected concentration (nanograms per gram[ng/g] or nanograms per liter [ng/L])
target risk level of RSL = 1×10^{-6} (unitless)
RSL = regional screening level based on carcinogenic risk of 1×10^{-6} (ng/g or ng/L)

For noncarcinogenic analytes identified as COPCs in Step 1, the noncarcinogenic hazard HQ was calculated using the following equation:

$$\textit{Noncarcinogenic HQ} = \frac{\textit{MDC x target HQ of RSL}}{\textit{RSL}}$$

Where:

MDC = maximum detected concentration (ng/g or ng/L)
target HQ of RSL = 1 (unitless)
RSL = regional screening level based on HQ of 1 (ng/g or ng/L)

The carcinogenic risk and the noncarcinogenic HQ were calculated for COPCs that act through carcinogenic and noncarcinogenic effects. The HQs for each medium in an area were summed to calculate the cumulative hazard index (HI). A cumulative HI was also calculated for each target organ/effect. The source of the target organs is Agency for Toxic Substances Disease Registry for PFOS, PFOA, and PFHxS (ATSDR, 2023). If the cumulative HI for a target organ/effect was greater than 0.5, the analytes significantly contributing to the HI were identified as preliminary human health COPCs for further evaluation. Only one of the PFAS (PFOA) is a potential carcinogen and has a currently available cancer toxicity. If the carcinogenic risk was greater than 5×10^{-5}, PFOA was identified as a preliminary human health COPC for further evaluation. The conservative target HI of 0.5 and target carcinogenic risk of 5×10^{-5} were used to account for the uncertainties in the HHRS, including the potential for other PFAS that are detected but do not currently have available toxicity values to contribute to the cumulative risk, the potential for PFAS not analyzed to be present and contribute to the cumulative risk, and since cumulative risks are not summed for all potential exposure media (i.e., soil and groundwater were evaluated individually). If sufficient data and information about the potential source area is available, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) threshold levels of HI = 1 and carcinogenic risk = 1×10^{-4} were also considered.

The HHRS is not intended for eliminating COPCs from evaluation in subsequent phases of investigation (such as the RI). During the RI, at a minimum, all eight PFAS compounds included in the DoD technical guidance (DoD, 2023) will be investigated for each RI site, and a site-specific risk assessment will be conducted.

3 Human Health Risk Screening Results

The HHRS results are presented in **Tables L-2** through **L-20a**.

3.1 Building 76

The samples collected at Building 76 and evaluated in this HHRS consist of the following:

- Nine surface soil samples
- Eleven subsurface soil samples
- Eight groundwater samples

The PFAS detected in Building 76 surface soil with RSLs were detected at concentrations below their RSLs (**Table L-2**).

The HHRS for Building 76 subsurface soil is provided in **Tables L-3** and **L-3a**. The maximum detected concentration of PFOS exceeded the RSL. The target organ HI associated with PFOS (developmental HI = 0.3) did not exceed the target HI of 0.5 and PFOS was not identified as a COPC.

The HHRS for Building 76 groundwater is provided in **Tables L-4** and **L-4a**. The maximum detected concentration of PFOA exceeded the RSL. The target organ HI associated with PFOA (developmental HI = 0.2) did not exceed the target HI of 0.5 and PFOA was not identified as a COPC.

No COPCs were identified for surface soil, subsurface soil, or groundwater at Building 76.

3.2 2008 Car Fire

The samples collected at the 2008 Car Fire site and evaluated in this HHRS consist of the following:

- Four surface soil samples
- Two subsurface soil samples
- Three groundwater samples

The PFAS detected in 2008 Car Fire area surface soil and subsurface soil with RSLs were detected at concentrations below their RSL (**Tables L-5** and **L-6**).

The HHRS for groundwater is provided in **Tables L-7** and **L-7a**. The maximum detected concentrations of PFOS, PFOA, and PFHxS exceeded their RSLs. The cumulative target organ HI associated with PFOS and PFOA (developmental HI = 23) and the target organ associated with PFHxS (endocrine HI = 1) were greater than the target HI of 0.5, and PFOS, PFOA, and PFHxS were identified as preliminary COPCs for further evaluation.

No COPCs were identified for surface soil or subsurface soil at the 2008 Car Fire area. PFOS, PFOA, and PFHxS were identified as preliminary COPCs for further evaluation in groundwater.

3.3 Keyport Sludge Disposal Area (OU 2/Area 5)

The samples collected at OU 2/Area 5 and evaluated in this HHRS consist of the following:

- One surface soil sample
- Six subsurface soil samples
- Three groundwater samples

The one PFAS detected in Keyport Sludge Disposal Area surface soil and subsurface soil (PFOS) was detected at concentrations below the RSL (**Tables L-8** and **L-9**) in both the surface and subsurface soil.

The HHRS for groundwater is provided in **Tables L-10** and **L-10a**. The maximum detected concentrations of PFOS and PFOA exceeded their RSLs. The cumulative target organ HI associated with PFOS and PFOA (developmental HI = 2) was greater than the target HI of 0.5, and PFOS and PFOA were identified as preliminary COPCs for further evaluation.

No COPCs were identified for surface soil or subsurface soil at the Keyport Sludge Disposal Area. PFOS and PFOA were identified as preliminary COPCs for further evaluation in groundwater.

3.4 Building 1006

The samples collected at Building 1006 and evaluated in this HHRS consist of the following:

- Five surface soil samples
- Two subsurface soil samples
- Four groundwater samples

The HHRS for Building 1006 surface soil is provided in **Tables L-11** and **L-11a**. The maximum detected concentration of PFOS exceeded the RSL. The target organ HI associated with PFOS (developmental HI = 0.2) did not exceed the target HI of 0.5 and PFOS was not identified as a COPC.

The HHRS for Building 1006 subsurface soil is provided in **Tables L-12** and **L-12a**. The maximum detected concentration of PFOS exceeded the RSL. The target organ HI associated with PFOS (developmental HI = 0.6) slightly exceeded the target HI of 0.5 but does not exceed the CERCLA HI threshold level 1, therefore, PFOS was not identified as a preliminary COPC.

The HHRS for groundwater is provided in **Tables L-13** and **L-13a**. The maximum detected concentrations of PFOS, PFOA, PFHxS, and PFNA exceeded their RSLs. The cumulative target organ HI associated with PFOS, PFOA, and PFNA (developmental HI = 7) was greater than the target HI of 0.5 and PFOS and PFOA were identified as preliminary COPCs since they contributed significantly to this HI. The target organ HI associated with PFHxS (endocrine HI = 0.2) did not exceed the target HI of 0.5 and PFHxS was not identified as a COPC.

No COPCs were identified for surface soil or subsurface soil at Building 1006. PFOS and PFOA were identified as preliminary COPCs for further evaluation in groundwater.

3.5 Van Meter Road Spill/ Former Drum Storage Area (OU 2/Area 2)

The samples collected at OU 2/ Area 2 and evaluated in this HHRS consist of the following:

- Three surface soil samples
- Five subsurface soil samples
- Six groundwater samples

The HHRS for the Van Meter Road Spill/ Former Drum Storage Area surface soil is provided in **Tables L-14** and **L-14a**. The maximum detected concentration of PFOS exceeded the RSL. The target organ HI associated with PFOS (developmental HI = 0.2) did not exceed the target HI of 0.5 and PFOS was not identified as a COPC.

The PFAS detected in Van Meter Road Spill/ Former Drum Storage Area subsurface soil with RSLs were detected at concentrations below their RSL (**Table L-15**).

The HHRS for groundwater is provided in **Tables L-16** and **L-16a**. The maximum detected concentrations of PFOS, PFOA, and PFHxS exceeded their RSLs. The cumulative target organ HI associated with PFOS and PFOA (developmental HI = 17) was greater than the target HI of 0.5 and PFOS and PFOA were identified as preliminary COPCs. The target organ HI associated with PFHxS (endocrine HI = 0.3) did not exceed the target HI of 0.5 and PFHxS was not identified as a COPC.

No COPCs were identified for surface soil or subsurface soil at the Van Meter Road Spill/ Former Drum Storage Area. PFOS and PFOA were identified as preliminary COPCs for further evaluation in groundwater.

3.6 Keyport Peninsula Fill (Site 7)

The samples collected at Site 7 and evaluated in this HHRS consist of the following:

- One surface soil sample
- Seven subsurface soil samples
- Four groundwater samples

The one PFAS detected in Keyport Peninsula Fill area surface soil and subsurface soil (PFOS) was detected at concentrations below the RSL (**Tables L-17** and **L-18**) in both the surface and subsurface soil.

The concentrations of the PFAS detected in Keyport Peninsula Fill area groundwater were below their RSLs (**Table L-19**).

No COPCs were identified for surface soil, subsurface soil, or groundwater at the Keyport Peninsula Fill area.

3.7 Landfill Extension (Northeast Portion of Area 22)

The samples collected at the Landfill Extension (Northeast Portion of Area 22) and evaluated in this HHRS consist of the following:

- Three surface soil samples

The one PFAS detected in Landfill Extension area surface soil (PFOS) was detected at a concentration below the RSL (**Table L-20**).

There were no PFAS detected in Landfill Extension area subsurface soil or groundwater; therefore, screening tables are not shown for these media.

No COPCs were identified for surface soil, subsurface soil, or groundwater at the Landfill Extension area.

3.8 Uncertainty Assessment

The objective of the SI is to determine whether PFAS are present in groundwater and soil at potential release areas at concentrations warranting further investigation. Only a limited number of samples, typically one to seven samples, targeting the most likely areas with the highest concentrations, were collected from each potential release area. Therefore, there is some uncertainty associated with the data, including whether the most contaminated area was sampled. Additionally for areas where Step 2 was performed, the maximum detected concentration was used to calculate the risk.

Subsurface soil samples were collected from 1 foot to 59 feet bgs. As discussed in Section 1, subsurface soil samples collected from depths greater than 12 feet bgs were not evaluated in the HHRS because a receptor (such as a construction worker) would not typically contact subsurface soil at depths greater than 12 feet bgs.

4 Human Health Risk Screening Findings

Table L-21 lists the Step 1 and Step 2 COPCs for each area and medium included in the HHRS. The following is a summary of the HHRS results for each area:

- Building 76
  - Surface soil: none
  - Subsurface soil: none
  - Groundwater: none
- 2008 Car Fire
  - Surface soil: none
  - Subsurface soil: none
  - Groundwater: PFOS, PFOA, PFHxS
- Keyport Sludge Disposal Area (OU 2/Area 5)
  - Surface soil: none
  - Subsurface soil: none
  - Groundwater: PFOS, PFOA
- Building 1006
  - Surface soil: none
  - Subsurface soil: none
  - Groundwater: PFOS, PFOA
- Van Meter Road Spill/ Former Drum Storage Area (OU 2/Area 2)
  - Surface soil: none
  - Subsurface soil: none
  - Groundwater: PFOS, PFOA

- Keyport Peninsula Fill (Site 7)
  - Surface soil: none
  - Subsurface soil: none
  - Groundwater: none
- Landfill Extension (Northeast Portion of Area 22)
  - Surface soil: none
  - Subsurface soil: none
  - Groundwater: none

The HHRS identified potential unacceptable risks associated with exposure to PFAS for groundwater at four areas (2008 Car Fire, OU 2/Area 5, Building 1006, and OU 2/Area 2) and potential unacceptable risks associated with exposure to PFAS for subsurface soil at one area (Building 1006). Unacceptable risks associated with exposure to PFAS were not identified for surface soil at the seven SI sites.

5 References

ATSDR. 2023. Minimum Risk Levels for Hazardous Substances. https://www.atsdr.cdc.gov/mrls/index.html. April.

CH2M HILL, Inc. (CH2M). 2018. *Initial Screening of Potential Per- and Polyfluoroalkyl Substances (PFAS) Source Areas at Naval Base Kitsap Keyport and Associated Special Areas, Keyport, Washington*. December.

CH2M. 2020. *Final Preliminary Assessment for Per- and Polyfluoroalkyl Substances (PFAS), Naval Base Kitsap Keyport and Associated Special Areas, Keyport, Washington*. October.

Department of Defense (DoD). 2023. *Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program*. August.

United States Environmental Protection Agency (USEPA). 2022. Regional Screening Level Summary Table. November.

USEPA. 2023. Regional Screening Level Summary Table. May.

Attachment 1
Human Health Risk Screening Tables

Table L-1. Summary of PFAS Data Used in Human Health Risk Screening

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap Keyport

Keyport, Washington

PFAS Source Area	Medium	Sample Location	Sample ID	Depth of Soil Sample (feet below ground surface)[a]	Date	Included in HHRS?
Building 76	Surface Soil	NBKK-B76-SS05	NBKK-B76-SS05-0001	0 - 1	9/2/2022	YES
	Subsurface Soil	NBKK-B76-MW01	NBKK-B76-SB01-0203	2 - 3	8/30/2022	YES
		NBKK-B76-MW01	NBKK-B76-SB01-2526	25 - 26	8/30/2022	NO
		NBKK-B76-MW02	NBKK-B76-SB02-0203	2 - 3	8/30/2022	YES
		NBKK-B76-MW02	NBKK-B76-SB02-4849	48 - 49	8/31/2022	NO
		NBKK-B76-MW03	NBKK-B76-SB03-0203	2 - 3	8/30/2022	YES
		NBKK-B76-MW03	NBKK-B76-SB03-3334	33 - 34	9/1/2022	NO
		NBKK-B76-MW04	NBKK-B76-SB04-0102	1 - 2	8/31/2022	YES
		NBKK-B76-MW04	NBKK-B76-SB04-5859	58 - 59	9/6/2022	NO
		NBKK-B76-SB05	NBKK-B76-SB05-0304	3 - 4	10/1/2022	YES
	Groundwater	NBKK-B76-MW01	NBKK-B76-MW01-1122	N/A	11/11/2022	YES
		NBKK-B76-MW02	NBKK-B76-MW02-1122	N/A	11/11/2022	YES
		NBKK-B76-MW03	NBKK-B76-MW03-1122	N/A	11/11/2022	YES
		NBKK-B76-MW04	NBKK-B76-MW04-1122	N/A	11/10/2022	YES
2008 Car Fire (adjacent to Building 198)	Surface Soil	NBKK-CF1-MW01	NBKK-CF1-SS01-0001	0 - 1	10/8/2022	YES
		NBKK-CF1-MW02	NBKK-CF1-SS02-0H01	0.5 - 1	11/1/2022	YES
		NBKK-CF1-SS04	NBKK-CF1-SS04-0001	0 - 1	9/30/2022	YES
		NBKK-CF1-SS05	NBKK-CF1-SS05-0001	0 - 1	9/30/2022	YES
	Subsurface Soil	NBKK-CF1-MW01	NBKK-CF1-SB01-5152	51 - 52	10/13/2022	NO
		NBKK-CF1-MW02	NBKK-CF1-SB02-1H2H	1.5 - 2.5	10/7/2022	YES
		NBKK-CF1-MW02	NBKK-CF1-SB02-3839	38 - 39	11/2/2022	NO
		NBKK-CF1-MW03	NBKK-CF1-SB03-0102	1 - 2	10/8/2022	YES
		NBKK-CF1-MW03	NBKK-CF1-SB03-5253	52 - 53	10/15/2022	NO
	Groundwater	NBKK-CF1-MW01	NBKK-CF1-MW01-1222	N/A	12/7/2022	YES
		NBKK-CF1-MW02	NBKK-CF1-MW02-1122	N/A	11/14/2022	YES
		NBKK-CF1-MW03	NBKK-CF1-MW03-1122	N/A	11/11/2022	YES
Keyport Sludge Disposal Area (OU	Surface Soil	NBKK-OU2A5-MW01	NBKK-OU2A5-SS01-0H01	0.5 - 1	9/7/2022	YES
	Subsurface Soil	NBKK-OU2A5-MW01	NBKK-OU2A5-SB01-3637	36 - 37	10/31/2022	NO
		NBKK-OU2A5-MW02	NBKK-OU2A5-SB02-0102	1 - 2	9/7/2022	YES
		NBKK-OU2A5-MW02	NBKK-OU2A5-SB02-2930	29 - 30	10/29/2022	NO
		NBKK-OU2A5-MW02	NBKK-OU2A5-SB02P-2930[b]	29 - 30	10/29/2022	NO
		NBKK-OU2A5-MW03	NBKK-OU2A5-SB03-0102	1 - 2	9/7/2022	YES
		NBKK-OU2A5-MW03	NBKK-OU2A5-SB03P-0102[b]	1 - 2	9/7/2022	YES
		NBKK-OU2A5-MW03	NBKK-OU2A5-SB03-3334	33 - 34	9/8/2022	NO
		NBKK-OU2A5-SB04	NBKK-OU2A5-SB04-0203	2 - 3	11/1/2022	YES
		NBKK-OU2A5-SB04	NBKK-OU2A5-SB04-0506	5 - 6	11/1/2022	YES
		NBKK-OU2A5-SB05	NBKK-OU2A5-SB05-0203	2 - 3	11/1/2022	YES
		NBKK-OU2A5-SB05	NBKK-OU2A5-SB05-1011	10 - 11	11/1/2022	YES
	Groundwater	NBKK-OU2A5-MW01	NBKK-OU2A5-MW01-1222	N/A	12/1/2022	YES
		NBKK-OU2A5-MW02	NBKK-OU2A5-MW02-1222	N/A	12/7/2022	YES
		NBKK-OU2A5-MW03	NBKK-OU2A5-MW03-1222	N/A	12/1/2022	YES
Building 1006	Surface Soil	NBKK-B1006-MW03	NBKK-B1006-SS03-0001	0 - 1	10/1/2022	YES
		NBKK-B1006-MW04	NBKK-B1006-SS04-0H01	0.5 - 1	11/3/2022	YES
		NBKK-B1006-MW04	NBKK-B1006-SS04P-0H01[b]	0.5 - 1	11/3/2022	YES
		NBKK-B1006-SS05	NBKK-B1006-SS05-0001	0 - 1	9/30/2022	YES
		NBKK-B1006-SS06	NBKK-B1006-SS06-0001	0 - 1	9/30/2022	YES
		NBKK-B1006-SS07	NBKK-B1006-SS07-0001	0 - 1	9/30/2022	YES
	Subsurface Soil	NBKK-B1006-MW01	NBKK-B1006-SB01-0102	1 - 2	10/1/2022	YES
		NBKK-B1006-MW02	NBKK-B1006-SB02-0102	1 - 2	10/1/2022	YES
	Groundwater	NBKK-B1006-MW01	NBKK-B1006-MW01-1122	N/A	11/9/2022	YES
		NBKK-B1006-MW02	NBKK-B1006-MW02-1122	N/A	11/9/2022	YES
		NBKK-B1006-MW03	NBKK-B1006-MW03-1122	N/A	11/9/2022	YES
		NBKK-B1006-MW04	NBKK-B1006-MW04-1222	N/A	12/8/2022	YES
		NBKK-B1006-MW04P	NBKK-B1006-MW04P-1222[b]	N/A	12/8/2022	YES

Table L-1. Summary of PFAS Data Used in Human Health Risk Screening

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap Keyport

Keyport, Washington

PFAS Source Area	Medium	Sample Location	Sample ID	Depth of Soil Sample (feet below ground surface)[a]	Date	Included in HHRS?
Van Meter Road Spill/ Former Drum Storage Area (OU 2/Area 2)	Surface Soil	NBKK-OU2A2-MW01	NBKK-OU2A2-SS01-0H01	0.5 - 1	11/5/2022	YES
		NBKK-OU2A2-MW02	NBKK-OU2A2-SS02-0H01	0.5 - 1	11/4/2022	YES
		NBKK-OU2A2-MW06	NBKK-OU2A2-SS06-0H01	0.5 - 1	11/8/2022	YES
	Subsurface Soil	NBKK-OU2A2-MW03	NBKK-OU2A2-SB03-0203	2 - 3	11/4/2022	YES
		NBKK-OU2A2-MW04	NBKK-OU2A2-SB04-0203	2 - 3	11/7/2022	YES
		NBKK-OU2A2-MW05	NBKK-OU2A2-SB05-0102	1 - 2	11/8/2022	YES
		NBKK-OU2A2-MW05	NBKK-OU2A2-SB05-0607	6 - 7	11/8/2022	YES
		NBKK-OU2A2-MW06	NBKK-OU2A2-SB06-0304	3 - 4	11/8/2022	YES
	Groundwater	NBKK-OU2A2-MW02	NBKK-OU2A2-MW02-1222	N/A	12/8/2022	YES
		NBKK-OU2A2-MW03	NBKK-OU2A2-MW03-1222	N/A	12/8/2022	YES
		NBKK-OU2A2-MW03	NBKK-OU2A2-MW03P-1222[b]	N/A	12/8/2022	YES
		NBKK-OU2A2-MW04	NBKK-OU2A2-MW04-1222	N/A	12/8/2022	YES
		NBKK-OU2A2-MW05	NBKK-OU2A2-MW05-1222	N/A	12/8/2022	YES
		NBKK-OU2A2-MW06	NBKK-OU2A2-MW06-1222	N/A	12/8/2022	YES
		NBKK-OUA2-MW2-8	NBKK-OU2A2-MW2-8-1222	N/A	12/8/2022	YES
Keyport Peninsula Fill (Site 7)	Surface Soil	NBKK-S7-MW02	NBKK-S7-SS02-0001	0 - 1	10/27/2022	YES
	Subsurface Soil	NBKK-S7-MW01	NBKK-S7-SB01-0102	1 - 2	10/28/2022	YES
		NBKK-S7-MW01	NBKK-S7-SB01-0809	8 - 9	10/28/2022	YES
		NBKK-S7-MW02	NBKK-S7-SB02-1011	10 - 11	10/27/2022	YES
		NBKK-S7-MW04	NBKK-S7-SB04-0102	1 - 2	10/25/2022	YES
		NBKK-S7-MW04	NBKK-S7-SB04-0910	9 - 10	10/25/2022	YES
		NBKK-S7-MW05	NBKK-S7-SB05-0102	1 - 2	10/26/2022	YES
		NBKK-S7-MW05	NBKK-S7-SB05-0910	9 - 10	10/26/2022	YES
	Groundwater	NBKK-S7-MW01	NBKK-S7-MW01-1222	N/A	12/2/2022	YES
		NBKK-S7-MW02	NBKK-S7-MW02-1222	N/A	12/2/2022	YES
		NBKK-S7-MW04	NBKK-S7-MW04-1222	N/A	12/2/2022	YES
		NBKK-S7-MW05	NBKK-S7-MW05-1222	N/A	12/2/2022	YES
		NBKK-S7-MW05	NBKK-S7-MW05P-1222[b]	N/A	12/2/2022	YES
Landfill Extension (Northeast Portion of Area 22)	Surface Soil	NBKK-LFEX-MW01	NBKK-LFEX-SS01-0001	0 - 1	10/4/2022	YES
		NBKK-LFEX-MW02	NBKK-LFEX-SS02-0001	0 - 1	10/3/2022	YES
		NBKK-LFEX-MW04	NBKK-LFEX-SS04-0001	0 - 1	10/4/2022	YES
	Subsurface Soil	NBKK-LFEX-MW01	NBKK-LFEX-SB01-2728	27 - 28	10/6/2022	NO
		NBKK-LFEX-MW02	NBKK-LFEX-SB02-2122	21 - 22	10/4/2022	NO
		NBKK-LFEX-MW03	NBKK-LFEX-SB03-0102	1 - 2	10/3/2022	YES
		NBKK-LFEX-MW03	NBKK-LFEX-SB03-0708	7 - 8	10/3/2022	YES
		NBKK-LFEX-MW03	NBKK-LFEX-SB03-1718	17 - 18	10/3/2022	NO
		NBKK-LFEX-MW04	NBKK-LFEX-SB04-2627	26 - 27	10/7/2022	NO
	Groundwater	NBKK-LFEX-MW01	NBKK-LFEX-MW01-1122	N/A	11/10/2022	YES
		NBKK-LFEX-MW02	NBKK-LFEX-MW02-1122	N/A	11/10/2022	YES
		NBKK-LFEX-MW03	NBKK-LFEX-MW03-1122	N/A	11/10/2022	YES
		NBKK-LFEX-MW04	NBKK-LFEX-MW04-1122	N/A	11/10/2022	YES

[a] Included subsurface soil samples up to 12 ft below ground surface in the HHRS.

[b] Duplicate of sample listed above

HHRS = Human Health Risk Screening

N/A = Not Applicable

PFAS = Per- and Polyfluoroalkyl Substances

imeframe: Current
Soil
Medium: Surface Soil

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	P AR
ctane sulfonic acid (PFOS)	9.1E-01 J	9.1E-01 J	ng/g	NBKK-B76-SS05-0001	1/1	0.519	9.1E-01	N/A	1.3E+01 N	N/A	

ected concentrations.
is used for screening.
vailable.
ratory (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Residential Soil.
on non-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropri
To Be Considered
J = Estimated Value
N = Noncarcinogenic
ng/g = nanogram(s) per gram
N/A = Not available

rio Timeframe: Future
m: Soil
ure Medium: Subsurface Soil

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value
prooctane sulfonic acid (PFOS)	**3.2E-01 J**	**4.0E+01**	**ng/g**	**NBKK-B76-SB04-0102**	**4/5**	**0.499 - 0.622**	**4.0E+01**	**N/A**	**1.3E+01 N**	**N/A**
prohexanesulfonic acid (PFHxS)	3.1E-01 J	8.1E-01 J	ng/g	NBKK-B76-SB04-0102	2/5	0.499 - 0.622	8.1E-01	N/A	1.3E+02 N	N/A

tected concentrations.
n is used for screening.
available.
oratory (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Residential Soil.
ased on non-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate R
To Be Considered
J = Estimated Value
N = Noncarcinogenic
ng/g = nanogram(s) per gram
N/A = Not available

Table L-3a. Risk Ratio Screening, Maximum Detected Concentration, Building 76 Subsurface Soil

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap Keyport

Keyport, Washington

Exposure Point / Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier) (ng/g)	Sample Location of Maximum Detected Concentration	Carcinogenic Residential Soil RSL (ng/g)	Target Risk Level of RSL	Cancer Risk[a]	Non-carcinogenic Residential Soil RSL (ng/g)	Target HQ of RSL	HQ[b]	Target Organ
Building 76 Subsurface Soil										
Perfluorooctane Sulfonate (PFOS)	4 / 5	4.0E+01	NBKK-B76-SB04-0102	N/A	N/A	N/A	1.3E+02	1	0.31	Developmental
Cumulative Hazard Index[c]									0.3	
Cumulative Cancer Risks						N/A				
								Total Developmental HI =		0.3

[a] Cancer Risk equals maximum detected concentration divided by the RSL divided by the target risk level of RSL.

[b] HQ equals maximum detected concentration divided by the RSL divided by the target HQ of RSL.

[c] Cumulative Hazard Index equals sum of HQs for each chemical.

[d] Cumulative Cancer Risk equals sum of Cancer Risks for each chemical.

Chemical selected as COPC if it significantly contributes to a target organ HI greater than 0.5 or a cumulative cancer risk greater than 5E-05.

Chemicals selected as COPCs are indicated by bold and shading.

COPC = Constituent of Potential Concern

HI = hazard index

HQ = Hazard Quotient

ng/g = nanogram(s) per gram

N/A = Not available/not applicable

RSL = Regional Screening Level

eframe: Future
undwater
dium: Groundwater

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Pot ARA Sc
nesulfonic acid (PFBS)	1.6E+00 J	1.8E+00 J	NG/L	NBKK-B76-MW01-1122	2/4	2.26 - 2.49	1.8E+00	N/A	6.0E+02 N	N/A	
nesulfonic acid (PFHxS)	1.1E+00 J	3.5E+00 J	NG/L	NBKK-B76-MW01-1122	4/4	2.26 - 2.49	3.5E+00	N/A	3.9E+01 N	N/A	

ected concentrations.
is used for screening.
vailable.
ratory (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Tap Water.
non-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Re
To Be Considered
J = Estimated Value
N = Noncarcinogenic
NG/L = Nanograms per liter
N/A = Not available

Timeframe: Current
Soil
Medium: Surface Soil

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source
octane sulfonic acid (PFOS)	1.5E+00	8.9E+00 T	ng/g	NBKK-CF1-SS02-0H01	4/4	0.5 - 0.501	8.9E+00	N/A	1.3E+01 N	N/A	N/A
octanoic acid (PFOA)	6.5E-01 J	7.1E-01 JT	ng/g	NBKK-CF1-SS02-0H01	3/4	0.5 - 0.501	7.1E-01	N/A	1.9E+01 N	N/A	N/A
nonanoic acid (PFNA)	2.2E-01 J	2.6E-01 JT	ng/g	NBKK-CF1-SS02-0H01	2/4	0.5 - 0.501	2.6E-01	N/A	1.9E+01 N	N/A	N/A

detected concentrations.
on is used for screening.
t available.
boratory (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Residential Soil.
d on non-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement
To Be Considered
J = Estimated Value
N = Noncarcinogenic
ng/g = nanogram(s) per gram
N/A = Not available
T = Hold time exceeded.

Timeframe: Future
Soil
Medium: Subsurface Soil

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source
octane sulfonic acid (PFOS)	1.3E+00	1.3E+00	ng/g	NBKK-CF1-SB02-1H2H	1/2	0.499	1.3E+00	N/A	1.3E+01 N	N/A	N/A
octanoic acid (PFOA)	2.9E-01 J	3.4E-01 J	ng/g	NBKK-CF1-SB03-0102	2/2	0.499	3.4E-01	N/A	1.9E+01 N	N/A	N/A
nonanoic acid (PFNA)	2.6E-01 J	2.6E-01 J	ng/g	NBKK-CF1-SB02-1H2H	1/2	0.499	2.6E-01	N/A	1.9E+01 N	N/A	N/A

detected concentrations.
on is used for screening.
t available.
boratory (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Residential Soil.
d on non-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement, To Be Considered
J = Estimated Value
N = Noncarcinogenic
ng/g = nanogram(s) per gram
N/A = Not available

frame: Future
ndwater
ium: Groundwater

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag
e sulfonic acid (PFOS)	**7.9E+00**	**9.0E+02**	**NG/L**	**NBKK-CF1-MW02-1122**	**3/3**	**2.34 - 2.4**	**9.0E+02**	**N/A**	**4.0E+00**	**N**	**N/A**	**N/A**	**YES**
oic acid (PFOA)	**3.1E+01**	**3.3E+01**	**NG/L**	**NBKK-CF1-MW03-1122**	**2/3**	**2.34 - 2.4**	**3.3E+01**	**N/A**	**6.0E+00**	**N**	**N/A**	**N/A**	**YES**
esulfonic acid (PFBS)	1.6E+01	3.2E+01	NG/L	NBKK-CF1-MW02-1122	2/3	2.34 - 2.4	3.2E+01	N/A	6.0E+02	N	N/A	N/A	NO
nesulfonic acid (PFHxS)	**1.8E+02**	**5.4E+02**	**NG/L**	**NBKK-CF1-MW02-1122**	**2/3**	**2.34 - 2.4**	**5.4E+02**	**N/A**	**3.9E+01**	**N**	**N/A**	**N/A**	**YES**

d concentrations.
ed for screening.
ble.
y (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Tap Water.
non-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
N = Noncarcinogenic
NG/L = Nanograms per liter
N/A = Not available

Table L-7a. Risk Ratio Screening, Maximum Detected Concentration, 2008 Car Fire (adjacent to Building 198) Groundwater

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap Keyport

Keyport, Washington

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier) (NG/L)	Sample Location of Maximum Detected Concentration	Carcinogenic Tap Water RSL (NG/L)	Target Risk Level of RSL	Cancer Risk[a]	Non-carcinogenic Tap Water RSL (NG/L)	Target HQ of RSL	HQ[b]	Target Organ
2008 Car Fire (adjacent to Building 198) Groundwater										
Perfluorooctane Sulfonate (PFOS)	**3 / 3**	**9.0E+02**	**NBKK-CF1-MW02-1122**	**N/A**	**N/A**	**N/A**	**4.0E+01**	**1**	**22**	**Developmental**
Perfluorooctanoic acid (PFOA)	**2 / 3**	**3.3E+01**	**NBKK-CF1-MW03-1122**	**1.1E+03**	**1E-06**	**3.0E-08**	**6.0E+01**	**1**	**0.55**	**Developmental**
Perfluorohexanesulfonic acid (PFHxS)	**2 / 3**	**5.4E+02**	**NBKK-CF1-MW02-1122**	**N/A**	**N/A**	**N/A**	**3.9E+02**	**1**	**1.4**	**Endocrine**
Cumulative Hazard Index[c]									**24**	
Cumulative Cancer Risk[d]						**3E-08**				
								Total Developmental HI =		23
								Total Endocrine HI =		1

[a] Cancer Risk equals maximum detected concentration divided by the RSL divided by the target risk level of RSL.

[b] HQ equals maximum detected concentration divided by the RSL divided by the target HQ of RSL.

[c] Cumulative Hazard Index equals sum of HQ for each chemical.

[d] Cumulative Cancer Risk equals sum of Cancer Risks for each chemical.

Chemical selected as COPC if it significantly contributes to a target organ HI greater than 0.5 or a cumulative cancer risk greater than 5E-05.

Chemicals selected as COPCs are indicated by bold and shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

HQ = Hazard Quotient

NG/L = Nanograms per liter

N/A = Not available/not applicable

RSL = Regional Screening Level

ame: Current

um: Surface Soil

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Poten ARAR/ Sour
sulfonic acid (PFOS)	3.4E-01 J	3.4E-01 J	ng/g	NBKK-OU2A5-SS01-0H01	1/1	0.559	3.4E-01	N/A	1.3E+01 N	N/A	N/A

d concentrations.
ed for screening.
ble.
y (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Residential Soil.
on-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requir
To Be Considered
J = Estimated Value
N = Noncarcinogenic
ng/g = nanogram(s) per gram
N/A = Not available

ame: Future

m: Subsurface Soil

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Pote ARAR Sou
sulfonic acid (PFOS)	3.3E-01 J	3.3E-01 J	ng/g	NBKK-OU2A5-SB03P-0102	1/6	0.499 - 0.524	3.3E-01	N/A	1.3E+01 N	N/A	N/

ted concentrations.
used for screening.
ilable.
tory (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Residential Soil.
on-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Require
To Be Considered
J = Estimated Value
N = Noncarcinogenic
ng/g = nanogram(s) per gram
N/A = Not available

rame: Future
ndwater
um: Groundwater

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag
e sulfonic acid (PFOS)	**3.2E+01**	**4.8E+01**	**NG/L**	**NBKK-OU2A5-MW01-1222**	**2/3**	**2.25 - 2.42**	**4.8E+01**	**N/A**	**4.0E+00**	**N**	**N/A**	**N/A**	**YES**
oic acid (PFOA)	**1.3E+01**	**2.8E+01**	**NG/L**	**NBKK-OU2A5-MW01-1222**	**2/3**	**2.25 - 2.42**	**2.8E+01**	**N/A**	**6.0E+00**	**N**	**N/A**	**N/A**	**YES**
esulfonic acid (PFBS)	3.1E+00 JT	3.1E+00 JT	NG/L	NBKK-OU2A5-MW03-1222	1/3	2.25 - 2.42	3.1E+00	N/A	6.0E+02	N	N/A	N/A	NO
esulfonic acid (PFHxS)	6.4E+00	9.0E+00	NG/L	NBKK-OU2A5-MW01-1222	2/3	2.25 - 2.42	9.0E+00	N/A	3.9E+01	N	N/A	N/A	NO

d concentrations.
ed for screening.
ble.
y (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Tap Water.
non-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
N = Noncarcinogenic
NG/L = Nanograms per liter
N/A = Not available
T = Holding Time exceeded

Table L-10a.Risk Ratio Screening, Maximum Detected Concentration, Keyport Sludge Disposal Area (OU 2/Area 5) Groundwater

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap Keyport

Keyport, Washington

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier) (NG/L)	Sample Location of Maximum Detected Concentration	Carcinogenic Tap Water RSL (NG/L)	Target Risk Level of RSL	Cancer Risk[a]	Non-carcinogenic Tap Water RSL (NG/L)	Target HQ of RSL	HQ[b]	Target Organ
Keyport Sludge Disposal Area (OU 2/Area 5) Groundwater										
Perfluorooctane Sulfonate (PFOS)	**2 / 3**	**4.8E+01**	**NBKK-OU2A5-MW01-1222**	**N/A**	**N/A**	**N/A**	**4.0E+01**	**1**	**1.2**	**Developmental**
Perfluorooctanoic acid (PFOA)	**2 / 3**	**2.8E+01**	**NBKK-OU2A5-MW01-1222**	**1.1E+03**	**1E-06**	**2.5E-08**	**6.0E+01**	**1**	**0.47**	**Developmental**
Cumulative Hazard Index[c]									**2**	
Cumulative Cancer Risk[d]						**3E-08**				
								Total Developmental HI =		2

Notes:

[a] Cancer Risk equals maximum detected concentration divided by the RSL divided by the target risk level of RSL.

[b] HQ equals maximum detected concentration divided by the RSL divided by the target HQ of RSL.

[c] Cumulative Hazard Index equals sum of HQ for each chemical.

[d] Cumulative Cancer Risk equals sum of Cancer Risks for each chemical.

Chemical selected as COPC if it significantly contributes to a target organ HI greater than 0.5 or a cumulative cancer risk greater than 5E-05.

Chemicals selected as COPCs are indicated by bold and shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

HQ = Hazard Quotient

NG/L = Nanograms per liter

N/A = Not available/not applicable

RSL = Regional Screening Level

rame: Current

um: Surface Soil

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag
e sulfonic acid (PFOS)	**2.1E-01 J**	**3.1E+01**	**ng/g**	**NBKK-B1006-SS05-0001**	**5/5**	**0.499 - 0.501**	**3.1E+01**	**N/A**	**1.3E+01 N**	**N/A**	**N/A**	**YES**
oic acid (PFOA)	2.8E-01 J	1.6E+01	ng/g	NBKK-B1006-SS05-0001	3/5	0.499 - 0.501	1.6E+01	N/A	1.9E+01 N	N/A	N/A	NO
esulfonic acid (PFHxS)	2.0E-01 JT	4.8E+00	ng/g	NBKK-B1006-SS05-0001	3/5	0.499 - 0.501	4.8E+00	N/A	1.3E+02 N	N/A	N/A	NO
oic acid (PFNA)	2.0E-01 J	8.1E+00	ng/g	NBKK-B1006-SS05-0001	3/5	0.499 - 0.501	8.1E+00	N/A	1.9E+01 N	N/A	N/A	NO

d concentrations.
ed for screening.
ble.
y (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Residential Soil.
non-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
N = Noncarcinogenic
ng/g = nanogram(s) per gram
N/A = Not available
T = Hold time exceeded.

Table L-11a. Risk Ratio Screening, Maximum Detected Concentration, Building 1006 Surface Soil

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap Keyport

Keyport, Washington

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier) (ng/g)	Sample Location of Maximum Detected Concentration	Carcinogenic Residential Soil RSL (ng/g)	Target Risk Level of RSL	Cancer Risk[a]	Non-carcinogenic Residential Soil RSL (ng/g)	Target HQ of RSL	HQ[b]	Target Organ
Building 1006 Surface Soil										
Perfluorooctane Sulfonate (PFOS)	5 / 5	3.1E+01	NBKK-B1006-SS05-0001	N/A	N/A	N/A	1.3E+02	1	0.24	Developmental
Cumulative Hazard Index[c]									0.2	
Cumulative Cancer Risks						N/A				
								Total Developmental HI =		0.2

[a] Cancer Risk equals maximum detected concentration divided by the RSL divided by the target risk level of RSL.

[b] HQ equals maximum detected concentration divided by the RSL divided by the target HQ of RSL.

[c] Cumulative Hazard Index equals sum of HQ for each chemical.

[d] Cumulative Cancer Risk equals sum of Cancer Risks for each chemical.

Chemical selected as COPC if it significantly contributes to a target organ HI greater than 0.5 or a cumulative cancer risk greater than 5E-05.

Chemicals selected as COPCs are indicated by bold and shading.

COPC = Constituent of Potential Concern

HI = Hazard Index

HQ = Hazard Quotient

ng/g = nanogram(s) per gram

N/A = Not available/not applicable

RSL = Regional Screening Level

eframe: Future
l
edium: Subsurface Soil

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potent ARAR/T Sourc
ane sulfonic acid (PFOS)	**8.3E+01 TD**	**8.3E+01 TD**	**ng/g**	**0102**	**1/2**	**0.5**	**8.3E+01**	**N/A**	**1.3E+01 N**	**N/A**	**N/A**
anoic acid (PFOA)	3.3E-01 J	3.3E-01 J	ng/g	0102	1/2	0.5	3.3E-01	N/A	1.9E+01 N	N/A	N/A
anesulfonic acid (PFHxS)	4.0E-01 J	4.0E-01 J	ng/g	NBKK-B1006-SS02-0102	1/2	0.5	4.0E-01	N/A	1.3E+02 N	N/A	N/A

ted concentrations.
used for screening.
ilable.
tory (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Residential Soil.
n non-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Require
To Be Considered
D = Dilution Run. Initial run outside the initial calibration rang
J = Estimated Value
N = Noncarcinogenic
ng/g = nanogram(s) per gram
N/A = Not available
T = Hold time exceeded.

Table L-12a. Risk Ratio Screening, Maximum Detected Concentration, Building 1006 Subsurface Soil

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap Keyport

Keyport, Washington

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier) (ng/g)	Sample Location of Maximum Detected Concentration	Carcinogenic Residential Soil RSL (ng/g)	Target Risk Level of RSL	Cancer Risk[a]	Non-carcinogenic Residential Soil RSL (ng/g)	Target HQ of RSL	HQ[b]	Target Organ
Building 1006 Subsurface Soil										
Perfluorooctane Sulfonate (PFOS)	1 / 2	8.3E+01 TD	NBKK-B1006-SS02-0102	N/A	N/A	N/A	1.3E+02	1	0.64	Developmental
Cumulative Hazard Index[c]									0.6	
Cumulative Cancer Risks						N/A				
								Total Developmental HI =		0.6

[a] Cancer Risk equals maximum detected concentration divided by the RSL divided by the target risk level of RSL.

[b] HQ equals maximum detected concentration divided by the RSL divided by the target HQ of RSL.

[c] Cumulative hazard index equals sum of HQ for each chemical.

[d] Cumulative Cancer Risk equals sum of Cancer Risks for each chemical.

Chemical selected as COPC if it significantly contributes to a target organ HI greater than the CERCLA threshold HI of 1 or a cumulative cancer risk greater than 1E-05.

Chemicals selected as COPCs are indicated by bold and shading.

COPC = Constituent of Potential Concern

D = Dilution Run. Initial run outside the initial calibration range of the instrument

HI = hazard index

HQ = Hazard Quotient

ng/g = nanogram(s) per gram

N/A = Not available/not applicable

RSL = Regional Screening Level

T = Hold time exceeded.

neframe: Future
oundwater
edium: Groundwater

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value
ane sulfonic acid (PFOS)	**1.5E+01**	**2.2E+02**	**NG/L**	**NBKK-B1006-MW02-1122**	**4/4**	**2.18 - 2.39**	**2.2E+02**	**N/A**	**4.0E+00 N**	**N/A**
anoic acid (PFOA)	**1.4E+00 J**	**7.6E+01**	**NG/L**	**NBKK-B1006-MW02-1122**	**4/4**	**2.18 - 2.39**	**7.6E+01**	**N/A**	**6.0E+00 N**	**N/A**
anesulfonic acid (PFBS)	2.5E+00 J	4.9E+00	NG/L	NBKK-B1006-MW02-1122	3/4	2.18 - 2.39	4.9E+00	N/A	6.0E+02 N	N/A
xanesulfonic acid (PFHxS)	**6.9E+00**	**6.6E+01**	**NG/L**	**NBKK-B1006-MW02-1122**	**3/4**	**2.18 - 2.39**	**6.6E+01**	**N/A**	**3.9E+01 N**	**N/A**
nanoic acid (PFNA)	**1.9E+00 J**	**7.6E+00**	**NG/L**	**NBKK-B1006-MW02-1122**	**2/4**	**2.18 - 2.39**	**7.6E+00**	**N/A**	**5.9E+00 N**	**N/A**

ected concentrations.
is used for screening.
vailable.
ratory (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Tap Water.
n non-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate To Be Considered
J = Estimated Value
N = Noncarcinogenic
NG/L = Nanograms per liter
N/A = Not available

Table L-13a. Risk Ratio Screening, Maximum Detected Concentration, Building 1006 Groundwater

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap Keyport

Keyport, Washington

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier) (NG/L)	Sample Location of Maximum Detected Concentration	Carcinogenic Tap Water RSL (NG/L)	Target Risk Level of RSL	Cancer Risk[a]	Non-carcinogenic Tap Water RSL (NG/L)	Target HQ of RSL	HQ[b]	Target Organ
Building 1006 Groundwater										
Perfluorooctane Sulfonate (PFOS)	**4 / 4**	**2.2E+02**	**NBKK-B1006-MW02-1122**	**N/A**	**N/A**	**N/A**	**4.0E+01**	**1**	**5.6**	**Developmental**
Perfluorooctanoic acid (PFOA)	**4 / 4**	**7.6E+01**	**NBKK-B1006-MW02-1122**	**1.1E+03**	**1E-06**	**6.8E-08**	**6.0E+01**	**1**	**1.3**	**Developmental**
Perfluorohexanesulfonic acid (PFHxS)	3 / 4	6.6E+01	NBKK-B1006-MW02-1122	N/A	N/A	N/A	3.9E+02	1	0.17	Endocrine
Perfluorononanoic acid (PFNA)	2 / 4	7.6E+00	NBKK-B1006-MW02-1122	N/A	N/A	N/A	5.9E+01	1	0.13	Developmental
Cumulative Hazard Index[c]									**7**	
Cumulative Cancer Risk[d]						**7E-08**				
								Total Developmental HI =		7
								Total Endocrine HI =		0.2

[a] Cancer Risk equals maximum detected concentration divided by the RSL divided by the target risk level of RSL.

[b] HQ equals maximum detected concentration divided by the RSL divided by the target HQ of RSL.

[c] Cumulative Hazard Index equals sum of HQ for each chemical.

[d] Cumulative Cancer Risk equals sum of Cancer Risks for each chemical.

Chemical selected as COPC if it significantly contributes to a target organ HI greater than 0.5 or a cumulative cancer risk greater than 5E-05.

Chemicals selected as COPCs are indicated by bold and shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

HQ = Hazard Quotient

NG/L = Nanograms per liter

N/A = Not available/not applicable

RSL = Regional Screening Level

io Timeframe: Current
m: Soil
ure Medium: Surface Soil

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Po AR S
rooctane sulfonic acid (PFOS)	**2.0E+01**	**2.0E+01**	**ng/g**	**NBKK-OU2A2-SS06-0H01**	**1/3**	**0.499 - 0.5**	**2.0E+01**	**N/A**	**1.3E+01 N**	**N/A**	
rooctanoic acid (PFOA)	8.1E-01 J	8.1E-01 J	ng/g	NBKK-OU2A2-SS06-0H01	1/3	0.499 - 0.5	8.1E-01	N/A	1.9E+01 N	N/A	
rohexanesulfonic acid (PFHxS)	1.3E+00 T	1.3E+00 T	ng/g	NBKK-OU2A2-SS06-0H01	1/3	0.499 - 0.5	1.3E+00	N/A	1.3E+02 N	N/A	

detected concentrations.
tion is used for screening.
ot available.
aboratory (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Residential Soil.
sed on non-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Re
To Be Considered
J = Estimated Value
N = Noncarcinogenic
ng/g = nanogram(s) per gram
N/A = Not available
T = Hold time exceeded.

Table L-14a. Risk Ratio Screening, Maximum Detected Concentration, Van Meter Road Spill/ Former Drum Storage Area (OU 2/Area 2) Surface Soil
Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap Keyport
Keyport, Washington

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier) (ng/g)	Sample Location of Maximum Detected Concentration	Carcinogenic Residential Soil RSL (ng/g)	Target Risk Level of RSL	Cancer Risk[a]	Non-carcinogenic Residential Soil RSL (ng/g)	Target HQ of RSL	HQ[b]	Target Organ
Van Meter Road Spill/ Former Drum Storage Area (OU 2/Area 2) Surface Soil										
Perfluorooctane Sulfonate (PFOS)	1 / 3	2.0E+01	NBKK-OU2A2-SS06-0H01	N/A	N/A	N/A	1.3E+02	1	0.16	Developmental
Cumulative Hazard Index[c]									0.2	
Cumulative Cancer Risks						N/A				
								Total Developmental HI =		0.2

[a] Cancer Risk equals maximum detected concentration divided by the RSL divided by the target risk level of RSL.
[b] HQ equals maximum detected concentration divided by the RSL divided by the target HQ of RSL.
[c] Cumulative Hazard Index equals sum of HQ for each chemical.
[d] Cumulative Cancer Risk equals sum of Cancer Risks for each chemical.
Chemical selected as COPC if it significantly contributes to a target organ HI greater than 0.5 or a cumulative cancer risk greater than 5E-05.
Chemicals selected as COPCs are indicated by bold and shading.

COPC = Constituent of Potential Concern
HI = Hazard Index
HQ = Hazard Quotient
ng/g = nanogram(s) per gram
N/A = Not available/not applicable
RSL = Regional Screening Level

o Timeframe: Future
n: Soil
e Medium: Subsurface Soil

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value
ooctane sulfonic acid (PFOS)	1.1E+00	4.0E+00	ng/g	NBKK-OU2A2-SS06-0304	3/5	0.499 - 0.5	4.0E+00	N/A	1.3E+01 N	N/A
ooctanoic acid (PFOA)	7.7E-01 J	7.7E-01 J	ng/g	NBKK-OU2A2-SS06-0304	1/5	0.499 - 0.5	7.7E-01	N/A	1.9E+01 N	N/A
ohexanesulfonic acid (PFHxS)	2.8E-01 JT	4.7E-01 JT	ng/g	NBKK-OU2A2-SS06-0304	2/5	0.499 - 0.5	4.7E-01	N/A	1.3E+02 N	N/A

etected concentrations.
on is used for screening.
t available.
boratory (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Residential Soil.
ed on non-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate To Be Considered
J = Estimated Value
N = Noncarcinogenic
ng/g = nanogram(s) per gram
N/A = Not available
T = Hold time exceeded.

ame: Future
dwater
m: Groundwater

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source
sulfonic acid (PFOS)	**3.0E+01**	**4.2E+02**	**NG/L**	**NBKK-OU2A2-MW2-8-1222**	**4/6**	**2.31 - 2.51**	**4.2E+02**	**N/A**	**4.0E+00 N**	**N/A**	**N/A**
ic acid (PFOA)	**4.1E+00 J**	**3.6E+02**	**NG/L**	**NBKK-OU2A2-MW2-8-1222**	**5/6**	**2.31 - 2.51**	**3.6E+02**	**N/A**	**6.0E+00 N**	**N/A**	**N/A**
esulfonic acid (PFHxS)	**5.3E+01**	**1.4E+02**	**NG/L**	**NBKK-OU2A2-MW06-1222**	**4/6**	**2.31 - 2.51**	**1.4E+02**	**N/A**	**3.9E+01 N**	**N/A**	**N/A**
oic acid (PFNA)	5.7E+00 Q	5.7E+00 Q	NG/L	NBKK-OU2A2-MW2-8-1222	1/6	2.31 - 2.51	5.7E+00	N/A	5.9E+00 N	N/A	N/A

ted concentrations.
used for screening.
ilable.
tory (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Tap Water.
on-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requiremen
To Be Considered
J = Estimated Value
N = Noncarcinogenic
NG/L = Nanograms per liter
N/A = Not available
Q = Ion ratio outside of criteria (50% difference from calibration e

Table L-16a. Risk Ratio Screening, Maximum Detected Concentration, Van Meter Road Spill/ Former Drum Storage Area (OU 2/Area 2) Groundwater

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap Keyport

Keyport, Washington

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier) (NG/L)	Sample Location of Maximum Detected Concentration	Carcinogenic Tap Water RSL (NG/L)	Target Risk Level of RSL	Cancer Risk[a]	Non-carcinogenic Tap Water RSL (NG/L)	Target HQ of RSL	HQ[b]	Target Organ
Van Meter Road Spill/ Former Drum Storage Area (OU 2/Area 2) Groundwater										
Perfluorooctane Sulfonate (PFOS)	**4 / 6**	**4.2E+02**	**NBKK-OU2A2-MW2-8-1222**	**N/A**	**N/A**	**N/A**	**4.0E+01**	**1**	**11**	**Developmental**
Perfluorooctanoic acid (PFOA)	**5 / 6**	**3.6E+02**	**NBKK-OU2A2-MW2-8-1222**	**1.1E+03**	**1E-06**	**3.2E-07**	**6.0E+01**	**1**	**6.0**	**Developmental**
Perfluorohexanesulfonic acid (PFHxS)	4 / 6	1.4E+02	NBKK-OU2A2-MW06-1222	N/A	N/A	N/A	3.9E+02	1	0.35	Endocrine
Cumulative Hazard Index[c]									**17**	
Cumulative Cancer Risk[d]						**3E-07**				
								Total Developmental HI =		17
								Total Endocrine HI =		0.3

[a] Cancer Risk equals maximum detected concentration divided by the RSL divided by the target risk level of RSL.

[b] HQ equals maximum detected concentration divided by the RSL divided by the target HQ of RSL.

[c] Cumulative Hazard Index equals sum of HQ for each chemical.

[d] Cumulative Cancer Risk equals sum of Cancer Risks for each chemical.

Chemical selected as COPC if it significantly contributes to a target organ HI greater than 0.5 or a cumulative cancer risk greater than 5E-05.

Chemicals selected as COPCs are indicated by bold and shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

HQ = Hazard Quotient

NG/L = Nanograms per liter

N/A = Not available/not applicable

RSL = Regional Screening Level

me: Current

m: Surface Soil

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potenti ARAR/T Source
sulfonic acid (PFOS)	2.9E-01 J	2.9E-01 J	ng/g	NBKK-S7-SS02-0001	1/1	0.499	2.9E-01	N/A	1.3E+01 N	N/A	N/A

ed concentrations.
used for screening.
able.
ory (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Residential Soil.
n-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requiren
To Be Considered
J = Estimated Value
N = Noncarcinogenic
ng/g = nanogram(s) per gram
N/A = Not available

meframe: Future
oil
Medium: Subsurface Soil

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Po AR S
ctane sulfonic acid (PFOS)	2.2E-01 J	2.2E-01 J	ng/g	NBKK-S7-SS04-0102	1/7	0.499 - 0.5	2.2E-01	N/A	1.3E+01 N	N/A	

detected concentrations.
ion is used for screening.
t available.
boratory (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Residential Soil.
on non-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Req
To Be Considered
J = Estimated Value
N = Noncarcinogenic
ng/g = nanogram(s) per gram
N/A = Not available

ame: Future
dwater
m: Groundwater

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	CO Fla
ic acid (PFOA)	1.4E+00 J	1.4E+00 J	NG/L	NBKK-S7-MW04-1222	1/4	2.29 - 2.39	1.4E+00	N/A	6.0E+00 N	N/A	N/A	N
sulfonic acid (PFBS)	4.8E+00 T	4.8E+00 T	NG/L	NBKK-S7-MW04-1222	1/4	2.29 - 2.39	4.8E+00	N/A	6.0E+02 N	N/A	N/A	N

ted concentrations.
used for screening.
ilable.
tory (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Tap Water.
on-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement
To Be Considered
J = Estimated Value
N = Noncarcinogenic
NG/L = Nanograms per liter
N/A = Not available
T = Holding Time exceeded

neframe: Current
il
edium: Surface Soil

Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source
ane sulfonic acid (PFOS)	2.3E-01 J	2.3E-01 J	ng/g	NBKK-LFEX-SS01-0001	1/3	0.499	2.3E-01	N/A	1.3E+01 N	N/A	N/A

ected concentrations.
s used for screening.
ailable.
atory (ORNL). November, 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Residential Soil.
n non-cancer (N) based on HQ = 0.1.

Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requiremer
To Be Considered
J = Estimated Value
N = Noncarcinogenic
ng/g = nanogram(s) per gram
N/A = Not available

Table L-21. Summary of Human Health Risk Screening Results

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap Keyport
Keyport, Washington

PFAS Area	Medium	Step 1 COPC	Step 2 COPC
Building 76	Surface Soil	None	--
	Subsurface Soil	PFOS	None
	Groundwater	None	--
2008 Car Fire (adjacent to Building 198)	Surface Soil	None	--
	Subsurface Soil	None	--
	Groundwater	PFOS, PFOA, PFHxS	PFOS, PFOA, PFHxS
Keyport Sludge Disposal Area (OU 2/Area 5)	Surface Soil	None	--
	Subsurface Soil	None	--
	Groundwater	PFOS, PFOA	PFOS, PFOA
Building 1006	Surface Soil	PFOS	None
	Subsurface Soil	PFOS	None
	Groundwater	PFOS, PFOA, PFHxS, PFNA	PFOS, PFOA
Van Meter Road Spill/ Former Drum Storage Area (OU 2/Area 2)	Surface Soil	PFOS	None
	Subsurface Soil	None	--
	Groundwater	PFOS, PFOA, PFHxS	PFOS, PFOA
Keyport Peninsula Fill (Site 7)	Surface Soil	None	--
	Subsurface Soil	None	--
	Groundwater	None	--
Landfill Extension (Northeast Portion of Area 22)	Surface Soil	None	--
	Subsurface Soil	[a]	--
	Groundwater	[b]	--

[a] No detections or exceedance of PALs for PFBS, PFOA, PFOS, PFNA, PFHxS, or HFPO-DA in soil, therefore, no screening tables are included for soil.

[b] No detections or exceedance of PALs for PFBS, PFOA, PFOS, PFNA, PFHxS, or HFPO-DA in groundwater, therefore, no screening tables are included for groundwater.

-- = The step was not performed because there were no COPCs in previous step.

COPC = Chemical of potential concern
PALs = Project Action Limits
PFAS = Per- and polyfluoroalkyl substances
PFOS = Perfluorooctane sulfonate
PFOA = Perfluorooctanoic acid
PFBS = Perfluorobutane sulfonate
PFNA = Perfluorononanoic acid
PFHxS = Perfluorohexanesulfonic acid
HFPO-DA = Hexafluoropropylene oxide dimer acid

Appendix M
Regulatory Response

Naval Base Kitsap Keyport
PFAS Site Inspection Report Comment Resolution
November 15, 2023
900-1100
via TEAMS
Teleconference Link
Call-in Number: 410-874-6751 Passcode: 401 269 036#
Meeting Minutes

Team Members

Kendra Clubb	NAVFAC NW, Senior Remedial Project Manager (RPM) - PFAS Lead
Amanda Rohrbaugh	NAVFAC NW, Keyport RPM
Jennifer Larson	NAVFAC NW, Keyport RPM
Binod Chaudhary	Department of Ecology, Site Manager
Michael Cronin	Department of Ecology, Site Manager
Andrew Schmeising	Suquamish Tribe, Keyport PM
Ben Leake	USEPA, Keyport RPM
JoAnn Grady	Grady and Associates, Meeting Facilitator
Rachel Clennon	CH2M/Jacobs, Task Manager
Dennis Ballam	CH2M/Jacobs, Project Manager
Brittany Prentice	CH2M/Jacobs, Tech Support, Notetaker

900: Introductions

- Introductions for team members

905: Meeting Objectives

- The goal of the meeting is to receive concurrence from team to move forward with site inspection (SI) report finalization.
- The deadline to finalize the SI Report is December 27, 2023.

907: PFAS Area of Interest Tracker Spreadsheet

- Kendra Clubb stated that there is a PFAS Area of Interest (AOI) Tracker that is used to track PFAS sites in the preliminary assessment, SI, and remedial investigation (RI) stages. This tracker is reviewed and updated two times per year. New information will be evaluated in this tracker and help with decisions for all AOIs. The designation of "no further investigation at this time" may change in the future based on evaluation of new information.
  - Binod Chaudhary inquired as to how the changes will be communicated with stakeholders. Kendra stated that for NBK Bangor and NBK Manchester discussion of the tracker is added to the monthly manager meetings to keep it in front of the team.
  - Ben Leake wanted to confirm who updates the tracker. Kendra stated that the tracker is individual spreadsheets for an installation filled out by the RPMs and pulled together into a larger spreadsheet after Kendra's review.
  - Andrew Schmeising requested that this be added to the Keyport tracking spreadsheet. Amanda Rohrbaugh can update the Keyport spreadsheet with AOI information.

920: PFAS Site Inspection Report Comment Resolution

- Ecology Comments:
  - Comment #4: Regarding the language "facility stormwater system as a migration pathway will be evaluated in more detail during the RI Phase." Is Building 76 moving to RI?

- Amanda stated that Building 76 is not moving to RI at this point, but during the RI the facility stormwater system will be investigated as a whole. For sites moving to RI, there would be a comprehensive look at the stormwater system. The areas not moving to RI might not be specifically looked at, but depending on connections, runs, and outfalls the evaluation may include those areas. Language will be added to the report for this. The schedule for the RIs is Fiscal Year (FY) 2028.
- Andrew commented that the RI starting in five years is outside of CERCLA guidelines. Would like to note that Ecology, the Tribe, and EPA had the same comment that if a detection exceeds the regional screening level (RSL) the site should go to RI. Building 76 has an exceedance and should move to RI.
- Ben stated that he understands the challenges with appropriations, but 2028 is later than the EPA would like to see, and the EPA would like to be involved in the prioritization process. The consistency of approach is a concern, compared to other sites Ben works on.
- Kendra noted that the sampling and analysis plan (SAP) for Keyport is consistent with other Navy sites regarding the decision logic flow chart. The Navy is evaluating PFAS by comparing results to RSLs, evaluate the conceptual site model (CSM), and determine if a release occurred at the site. Kendra notes different agencies may implement screening differently, but the Navy approach has been consistent between sites. She also notes that we are still having site—specific discussions that may or may not change recommendations. Lastly, Kendra notes that Amanda tried to get the RIs started sooner, but due to budgetary controls for our program over the past five years, they got pushed out. Sites are prioritized based on known off-Base impacts, but Kendra agrees prioritization discussions with regulators/stakeholders could be helpful, but the decision to do so would be made at a higher level, such as Tier II or Tier III.
- Andrew stated that the Human Health Risk Screening (HHRS) is to help the Department of Defense prioritize sites, which is fine, but it is not appropriate to use it to determine which sites go to RI when we have an exceedance of RSLs.
- Binod stated that Ecology requests that the Navy consider moving Building 76 to RI. Ecology does not concur with the response to Comment #8. Binod is fine with the responses to the rest of the comments.
- Michael Cronin noted that there were some errors in boring logs. Amanda asked that Michael send the team the errors that were found and they can be corrected.

- Tribe Comments:
  - Comment #6: Concur.
  - Comment #7: Response creates concern. If there are issues with radiological material and health and safety, why is there no active investigation for Area 22?
    - Amanda checked historic investigation document and no evidence of radiological concern and only sporadic detections of other types of contaminants; based on this information it seems reasonable that the site did not progress forward at that time. She can provide the historic investigation document to members of the team if needed.
    - Dennis Ballam noted that it is Jacobs' protocol to assume that landfills have radiological material at locations like this and Jacobs tries to avoid drilling into landfills because there isn't good information on what material is being drilled into.
    - Jacobs will specify in the response that there is no evidence of radiological materials and that it is company protocol not to drill into landfills for health and safety of workers. Rachel noted that radiological monitoring did occur during implementation of field work at Area 22, as well as at Site 7, as an additional precaution. Binod request that some language is added to the redline to clarify radiological monitoring.

- EPA Comments:
  - Ben notes all response adequate, other than those for Comments #4 and #6, which are the comments pertaining to Building 76.
- Building 76 "NFA" Discussion
  - Ben acknowledges that both sides are technically sound, so this site is a gray area. Ben stated that considering the FY 2028 timeframe for the RI and PFAS regulations frequently changing, it's likely that levels will only get more conservative, rather than less conservative, and sites will get reconsidered before this time. Therefore, it's reasonable to request funds now rather than later to prevent further delay. Andrew agrees.
  - Kendra notes that Building 76 does not have another site nearby, which makes it difficult to wrap it together with another area, as may have been done at other installations.
  - The team walked through Figure 4-1 data and CSM for Building 76.
    - Amanda notes some positives are that wells closer to installation boundary are below RSLs or non-detect, so it's unlikely anything is migrating off-site. Also positive that additional soil samples around the soil detection at MW-04 were also below RSLs or non-detect, indicating limited soil extent.
    - Andrew stated that the uncertainty of groundwater flow in the area is a key factor. Michael noted that there is concern that migration may be pulled to the west toward MW02 with a preferential direction to the north. Andrew suggested going to RI due to the data gaps. Ben agreed. Binod agreed.
    - Kendra stated that this is a great discussion and there will need to be additional internal discussions within the Navy to determine if these points warrant an RI.
- Amanda stated that the Navy will provide the files for backcheck before finalizing the document. Ben offered to email the team which comments are accepted, and which ones are a work in progress to track the comments status. Amanda agreed this would be helpful.
- Binod inquired on whether data had been validated. Amanda stated that yes, all of the updates were incorporated into the document and there were not any significant changes based on data validation but will confirm.
- Ecology will provide the responses once resolution of the Navy internal discussion is shared.
- Kendra confirmed that Navy internal discussion would occur this week to keep the revisions going to meet the December 27, 2023, finalization deadline.

Meeting Wrap-up

- Action Items
  - Kendra to discuss with headquarters about sharing the PFAS AOI Master Tracker spreadsheet with the stakeholders.
  - Jacobs to add language to the document and response matrix regarding landfill drilling health and safety protocol.
  - Navy to have internal discussion regarding moving Building 76 to RI.
  - Navy to confirm that there were no significant changes due to data validation.
  - Michael of Ecology to send additional comments on boring logs via e-mail in Word format, for addition to the RTC file.

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e private drinking water wells may exist in the town of Keyport, which is n 1-mile in an estimated cross gradient direction of the building 76 potential release area, PFOA and PFOS either individually or combined were not cted in groundwater." se make correction to the highlighted sentence during redline revision. Based he extended SI data there are PFOA detections and results above current .	Section 2.3 has been updated following the additional investigation activities at Building 76 to note that there were no detected concentrations of PFOS or PFOA above 70 ng/L in monitoring wells associated with Building 76. An updated comparison of the results to PALs is presented in Section 4.1.1. See also the response to Comment 6.	Section 2.3 has been updated following the additional investigation a at Building 76 to note that there were no detected concentrations of PFOA above 70 ng/L in monitoring wells associated with Building 76 a is thought to be no potential exposure pathway via drinking water. An comparison of the results to PALs is presented in Section 4.1.1. Howe revised text in Section 4.1.1/Table 4-1 acknowledges the uncertainties regarding groundwater hydraulics south of Building 76, and in light of proximity to the Base boundary and residential parcels, and the excee of groundwater RSLs at three monitoring well locations, the recomme for the path forward on Building 76 has been updated to move forwa
/ was characterized as nonhazardous." t is a concentration of PFOS for IDW to consider IDW as nonhazardous es?	No PFAS are currently identified as hazardous waste under Federal regulations and are considered nonhazardous at any concentration.	
se make correction on the following for the date. pecific reason for this deviation was noted in field notes from set up on this on October 13, 2023."	The date described in this column has been updated to October 13, 2022.	
you please show the location of sump on Figure 4-1? There are four nwater catch basins. Are all catch basins sumps since the map shows nwater catch basin at the end of trench drain?	Figure 4-1 has been updated to show the approximate location of the sump at Building 76. A description of the stormwater infrastructure as provided in the Preliminary Assessment indicates that the sump is designed specifically to contain surface water / overland flow from the truck ramp, which is then transferred to the on-Base Transport, Storage, and Disposal Facility (TSDF) prior to off-site disposal. Each of the other catch basins are believed to have sumps; the stormwater catch basins discharge to Puget Sound. The overall facility stormwater system as a migration pathways will be evaluated in more detail during the RI Phase.	Revised text in Section 4.1.1/Table 4-1 acknowledges the uncertaintie regarding groundwater hydraulics south of Building 76 due to the pre the retaining wall at the western Base boundary and the stormwater replacement project which occurred in 2010-2011. These uncertaintie among the lines of evidence to recommend moving the site to RI.
se also include how surface runoff was/is managed at this site. So, fate and sport of released PFAS compounds if any can be properly assessed for ntial releases to the environment. he worksheet #10 for Building 76 site, water collected in the sump is sent off- or disposal. What is the fate of runoff water in stormwater catch basins n on Figure 4-1 and Figure 4-2?	In accordance with the Preliminary Assessment description of Building 76, the water contained in the sump is transferred via pump truck to the on-Base TSDF for storage prior to transportation and off-site disposal. The stormwater catch basins discharge to Puget Sound. The stormwater system serves as a potential pathway for PFAS to impact sediment, surface water, and aquatic organisms, which will be investigated (where the pathway is relevant) during the RI. The outfall location is not known due to inconsistencies and gaps in stormwater system data. A reference has been added to each of the Section 4 tables in the 'SI Approach' section to provide reference to the Preliminary Assessment's description of surface water/ overland flow.	

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ddition, per Navy Policy, since the there were no detections of PFOS and/or A in the groundwater wells above 70 ng/L and estimated groundwater flow tion is cross-gradient from potential off-base drinking water wells, there is complete exposure pathway from Building 76 to off-Base drinking water ." Navy reconsider drinking water exposure assessment if, in future, Navy will ify action levels of PFOA and PFOS after finalization of proposed national ary drinking water standards? If so, please include statement on the ective section for the site where PFOA and PFOS are detected but less than pt.	The Navy and DoD are closely monitoring the proposed National Primary Drinking Water Regulation rulemaking process. The following footnote has been added to Section 2.3, where the 70 ppt (ng/L) value is first mentioned, "EPA issued lifetime drinking water health advisories for PFOA and PFOS in May 2016 of 70 ng/L, individually or combined. On March 14, 2023, EPA proposed a draft regulatory drinking water standard for certain PFAS, including PFOA and PFOS. In response, DoD has issued the following statement: "DoD respects and values the public comment process on this proposed nationwide drinking water rule and looks forward to the clarity that a final regulatory drinking water standard for PFAS will provide. In anticipation of the final standard that EPA expects to publish by the end of 2023, the DoD is assessing what actions DoD can take to be prepared to incorporate EPA's final regulatory standard into our current cleanup process, such as reviewing our existing data and conducting additional sampling where necessary. In addition, DoD will incorporate nationwide PFAS cleanup guidance, issued by EPA and applicable to all owners and operators under the federal cleanup law, as to when to provide alternate water when PFAS are present." The Navy recognizes that site management decisions may be re-evaluated if new information becomes available or new screening or regulatory criteria are developed in the future. The Navy would then reassess and proceed within the CERCLA process as appropriate.	
surface soil samples collected below 12 feet bgs are deeper than a human ptor is expected to contact and therefore were not included in the HHRS for ing 76." se consider subsurface soil samples 15 ft bgs instead of 12 feet bgs for HHRS his and other sites. In accordance with WAC 173-340-740(6)(d), point of pliance for soil cleanup levels is 15 ft bgs based on human exposure via direct act or other exposure pathways.	Soil samples from depths between 12-15 feet bgs have been added to the HHRS. In total, 1 soil sample collected from intervals between 12-15 feet bgs was added to the HHRS, and Building 76 was the only SI site to which this update was applicable in the HHRS.	
gy does not agree with the Navy's recommendation for Building 76 site. gy would like to recommend initiating RI for this site because of the wing reasons: site is close to residential areas. nvestigation shows the detections of few PFAS compounds above current . pths of trench and sump are unknown. Also, it is not clear whether there are rmeable layers or not at the bottom of trench and sump.	Section 4.1.1 and Table 5-1 have been revised to reflect additional data collected at Building 76. As reflected in the revisions, the HHRS for Building 76 indicated that there are no unacceptable human health risks associated with exposure to PFAS in this area. As a result, the Navy has determined that Building 76 should not be further investigated at this time. The Navy recognizes that site management decisions may be re-evaluated if new information becomes available or new screening or regulatory criteria are developed in the future. The Navy would then reassess and proceed within the CERCLA process as appropriate.	Please see revised response to Comment #1. The path forward on Bui has been updated to move forward to RI.
hs of some monitoring wells (e.g., NBKK-OU2A5-MW03) are lower than the ective boring depths. Can you please clarify why these wells were installed at ower depths instead of the total depth of borings?	During monitoring well installation, soil borings were advanced to determine the optimal water-bearing zone(s) across which to place screens. Both the logged lithology and depth to water information were used for final screen placement. In some cases, an obvious water-bearing lithologic zone for a ten-foot screen length was not observed; therefore, drilling continued to provide additional lithologic information before a screen interval was selected above the boring's total depth.	

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ng the review several inconsistencies, discrepancies, and potential logging akes, were noted in the boring logs. These issues do not materially change indings of the report; however, these issues can cause uncertainty in the data rd. se note that ECY did not conduct a comprehensive review for data quality and ests the following issues be addressed and an additional QC check of the ng logs be completed:	See responses provided for each subcomment below.	
neral – Well details on boring logs do not show or state where the well inates, in some cases (i.e., NBKK-CF1-MW02) gives the incorrect impression were constructed with sumps. Please include the total well depth in the ng log.	Well logs in Appendix C have been reviewed and revised to clearly state the total depth of each well as constructed, as well as the bottom of borehole, which was typically deeper than the bottom of the monitoring well. Wells were constructed without sumps, and soil boring and well completion logs have been revised to remove any suggestion of a sump in the graphics below well screen intervals.	
neral– Multiple borings (i.e. NBKK-B76-MW01, NBKK-B76-MW02) lack USCS riptions for shallow soils (0 to 6 ft bgs) including in areas where soil samples e taken, while other borings (NBKK-CF1-MW01) logged soil descriptions in this val. Please confirm if shallow soils were not logged for certain borings or add missing descriptions to the boring logs.	For borings with missing shallow lithologic descriptions, a comment has been added to state that these were hand augered or air knifed and were not logged. This includes the following soil borings: - NBKK-B76-MW01 - NBKK-B76-MW02 - NBKK-B76-MW03 - NBKK-B76-MW04 - NBKK-CF1-MW02 - NBKK-OU2A5-MW01 - NBKK-OU2A5-MW02 - NBKK-OU2A5-MW03 - NBKK-B1006-MW02 - NBKK-B1006-MW04 - NBKK-OU2A2-MW01 - NBKK-OU2A2-MW02 - NBKK-OU2A2-MW03 - NBKK-OU2A2-MW04 - NBKK-OU2A2-MW05 - NBKK-S7-MW04 - NBKK-S7-MW05	
neral – Please clarify if well screen interval is below top of casing or below nd surface, Table 4-1 has depths as (ft bgs) and Table C-1 uses (ft btoc)	Well screen is cited as below ground surface. Table C-1 updated to “ft bgs” to be consistent with the boring logs in Appendix C.	
ing Log NBKK-B76-MW02: Screen interval is documented as 49 – 69 ft instead – 59 ft	The well screen interval is 49-59 feet bgs. Boring log and well completion diagram in Appendix C have been revised.	
ing Log NBKK-B76-MW04: Screened interval is documented as 58-69 ft, Table nd Table 4-1 lists the screen interval as 59-69 ft	The well screen interval is 59-69 feet bgs. Boring log and well completion diagram in Appendix C have been revised.	
ing Log NBKK-B76-MW03: The soil interval from 37 to 40 ft bgs is not logged ring log. Is this a mistake or intentional due to a lack of recovery?	There was no recovery in th 37-40 ft bgs interval. A note has been added to this boring log in Appendix C.	
ing Log NBKK-B76-MW04: Interval from 42 to 52 ft-bgs is logged as a Clayey with Gravel (SC), the description is “Moist, Dense, Clay, with fine to coarse ed, subangular sand, with clay, and fine to coarse grained, subangular to ounded gravel, trace silt” (sic) description with Clay at the start is not istent with USCS and is not repeated in other descriptions of SC soils in the ng log. Confirm if interval is accurately logged	The lithologic description for this interval has been updated in the 42-52 ft bgs interval to align with other SC descriptions within the boring log(s).	
ing Log NBKK-B1006-MW01: Boring log states “Hand auger to 3.0 ft bgs, Air to 6.0 ft bgs” Field notes from 10/1/2022 (page 102/1442 on the September draft submission) indicate boring was air knifed to 3.0 ft bgs then hand red to 6 ft bgs after water was encountered at 3 ft bgs.	The field notes are correct: air knifing was completed to 3 ft bgs, followed by hand augering to 6 ft bgs due to the presence of the water table. The boring log has been revised to reflect this discrepancy.	

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potentiometric Surface Map excludes data from monitoring wells NBKK-B76-02 and NBKK-B76-MW04 stating "Groundwater elevations measured in wells K-B76-MW02 and NBKK-B76-MW04, screened at approximately -5 to -15 feet D88, reflect hydraulic conditions in a deeper portion of the aquifer than those sured in the remaining site wells, which are screened at approximately 1 to AVD88 feet. Therefore, these water levels were not included in development e potentiometric surface map." s concerned about the exclusion of these wells given the data available, cularly the exclusion of NBKK-B76-MW02. There a 7-foot elevation difference rates the bottom of NBKK-B76-MW03 and top of NBKK B76-MW02 screens he boring logs indicate the upper section of NBKK-B76-MW02's screen is in imilar material as NBKK-B76-MW03. Topography in the immediate vicinity ates a dip towards the west in the vicinity which shallow groundwater may or. If this location's hydraulic conditions are indicative of the upper portion of quifer there is a pathway for migration of groundwater to the west (offsite) ilding 76 location. n the complexity of hydrogeology in glaciated areas, ECY recommends future stigations include an additional well(s) screened at depth and a shallow well ened further west to verify the hydrologic conditions.	The commentor is correct that there is an approximate 7-foot separation between the top of the screen in NBKK-B76-MW02 and the bottom of the screen NBKK-B76-MW03. The lithologic material apparently separating these two screened intervals, based on the boring logs, is described as silty sand with gravel. However, it should be noted that the lateral distance between these wells is approximately 120 ft, and there is significant uncertainty as to whether the silty sand unit observed at each boring is a continuous unit extending between the wells. Further, the groundwater elevations measured in the site monitoring wells clearly indicate a strong downward hydraulic gradient at this site, with deeper well screens exhibiting groundwater elevations considerably lower than those measured in shallower wells screens. When estimating groundwater flow directions from individual monitoring well water levels in the presence of vertical gradients, it is essential to only compare water levels that are screened at approximately similar elevations. For this reason, the heads measured in wells NBKK-B76-MW02 and NBKK-B76-MW04 were excluded from the estimation of groundwater flow directions at the site. As this site is being carried forward to an RI, additional investigation of water levels and flow directions, including in areas adjacent to the base boundary, will be collected and analyzed to improve understanding of groundwater flow directions at the site.	
ferences in the hydraulic conditions at depth within the aquifer are present it ld be noted that a potential pathway for direct communication between ng zones within the aquifer may exist at NBKK B76-MW02. boring log notes a 3-foot elastic silt MH at (-8.55 – -11.55 feet NAVD88) n NBKK B76 MW02's screened interval. Thicker clays are present at similar hs in the NBKK B76 MW04 boring. With only two borings at this depth, it is ear if these potential aquicludes are a laterally continuous local feature. itoring of the site should be vigilant for changes in conditions at NBKK B76-02.	As noted in the response to Comment #11, Building 76 will be moving forward to an RI, and additional characterization of site stratigraphy and hydrogeologic conditions will be performed as part of that investigation. These data will be utilized during the RI to assess the potential for hydraulic communication, and potential contaminant migration, between different depth intervals within the site aquifer system.	

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S was detected in soil samples above the SLs." on this result, do not concur with NFA recommendation for Building o surface soil locations had PFOS above the SLs, and there were low etections of PFOS at multiple other shallow soil locations. August W results indicate PFOA above the SLs. This location should be d in the RI.	Section 4.1.1 and Table 5-1 have been revised to reflect additional data collected at Building 76. As reflected in the revisions, the HHRS for Building 76 indicated that there are no unacceptable human health risks associated with exposure to PFAS in this area. As a result, the Navy has determined that Building 76 should not be further investigated at this time. The Navy recognizes that site management decisions may be re-evaluated if new information becomes available or new screening or regulatory criteria are developed in the future. The Navy would then reassess and proceed within the CERCLA process as appropriate.	Revised text in Section 4.1.1/Table 4-1 acknowledges the uncertainties regarding groundwater hydraulics south of Building 76, and in light of the site's proximity to the Base boundary and residential parcels and the exceedances of groundwater RSLs at three monitoring well locations, the recommendation for the path forward on Building 76 has been updated to move forward to RI.	
A... were not detected in groundwater at Building 76." tement is untrue. Please correct to account for supplemental data.	Descriptions of scope, data, and conclusions/ recommendations from the additional investigation work at Building 76 has been incorporated into the SI report in redline format, including PFOA data in groundwater.		
on the HHRS, no chemicals of potential concern (COPCs) were ed for groundwater." time this document went to draft printing, it was known that three Ws at Building 76 had PFOA detections above the SLs. It is recognized s report was supposed to have been written and finalized before the ta came out, but given that the new data (included in Table 4-9) dicts the summary, conclusions and recommendations, this site needs o RI.	Please see response to Comment #1.	Please see response to Comment #1.	
ntrations of PFOA, PFOS, PFBS, PFNA, PFHxS, and HFPO-DA did not SLs in groundwater." tement is untrue. Please correct to account for supplemental data.	Descriptions of scope, data, and conclusions/ recommendations from the additional investigation work at Building 76 has been incorporated into the SI report in redline format.		
rther Investigation at this time." be does not concur. MWs 7, 8, and 9 Have PFOA above the SLs for indicated.	Please see response to Comment #1.	Please see response to Comment #1.	
rther Investigation at this time." .	Comment noted.		
rther Investigation at this time." discussion. Why no sample locations(s) within the center area of the extension. Is it worth a look since there was a low level surface soil on? There were no GW detections at all, but again, no samples were ed from the center of the area.	When developing the sampling approach described in the SAP, investigation locations at the Landfill Extension were selected to avoid drilling directly in the middle of the landfill area for health and safety and radiological concerns. Investigation locations were placed upgradient, cross-gradient, and downgradient of the Landfill Extension extent based on presumed groundwater flow direction.	When developing the sampling approach described in the SAP, investigation locations at the Landfill Extension were selected to avoid drilling directly in the middle of the landfill area for health and safety and radiological concerns. Although there were no known radiological concerns at the Landfill Extension, as a matter of policy, Jacobs does not drill through potential landfill locations for health and safety and radiological concerns. Investigation locations were placed upgradient, cross-gradient, and downgradient of the Landfill Extension extent based on presumed groundwater flow direction.	When developing the sampling approa investigation locations at the Landfill Ex drilling directly in the middle of the lan and radiological concerns. Although the concerns at the Landfill Extension, as a not drill through potential landfill locati radiological concerns. Investigation loc cross-gradient, and downgradient of th based on presumed groundwater flow no detections of PFAS in groundwater a further investigation appears to be war

Comment	Response	Updated Response 11/27/2023	U
romulgated draft EPA Method 1633, designed for the analysis of PFAS ds in soil, biosolids, groundwater, wastewaters, and tissues for non-drinking rces. Understanding that the Site Inspection (SI) Sampling and Analysis Plan primarily written before widespread use of Method 1633, using Method the SI was acceptable, and EPA appreciates the analysis the 18 PFAS ds listed in Method 537.1. EPA expects that Method 1633 will be used for ing water matrices in the Remedial Investigation (RI) phase and nds Method 533 or 537.1 continue to be used for drinking water analyses. If cted and analyzed using Method 1633 during the RI demonstrate a discrepancy from the SI results, further consideration and discussion the Keyport Managers will be necessary.	Noted. As established in guidance issued after completion of Keyport PFAS SI fieldwork, the DoD currently requires use of draft Method 1633 for definitive analysis of PFAS in matrices other than drinking water (DoD, 2023a). It is therefore anticipated that analysis conducted during the RI will include analysis by draft Method 1633.		
e Preliminary Assessment (PA), stakeholders expressed concerns about the nclusions regarding which sites to carry forward into the SI. Buildings 84, 1051 were of particular concern due to their operational history and the of Building 84 and 825 to OU2 Area 8, where PFAS is known to be above levels from previous sampling events. Now that the presence of PFAS has irmed in other portions of the Keyport site, and an RI is warranted, EPA hat the Navy will document all known and potential PFAS sources in a ensive Conceptual Site Model (CSM) and risk assessment during the RI. This l for developing and evaluating effective remedial alternatives, including ther action alternative.	As noted in the 2023 ASD memo (DoD, 2023b), the DoD intends to reassess PA/SIs with determinations of "no further action" as there are updates or additions to existing PFAS-related RSLs.		
ance with the 2023 ASD Memo, the RI should also include a reassessment of r Action sites based on updated RSLs. EPA understands that investigating urce areas may need to be prioritized, and this prioritization process should ocumented and agreed upon by the project team.	Please see response to Comment #2.		
sed during the Keyport Manager's Meeting on September 20, 2023, sampling was performed around Building 76. That data warrants moving nto the RI phase, but those conclusions were not updated in this draft of ort. EPA understands that the Navy will update each of the relevant 6 sections, figures, and tables in the revised report, and requests that those e presented in red line strike out format.	Descriptions of scope, data, and conclusions/ recommendations from the additional investigation work at Building 76 has been incorporated into the SI report in redline format. The conclusions for Site 76 remain unchanged and it is recommended for NFI.	Revised text in Section 4.1.1/Table 4-1 acknowledges the uncertainties regarding groundwater hydraulics south of Building 76, and in light of the site's proximity to the Base boundary and residential parcels and the exceedances of groundwater RSLs at three monitoring well locations, the recommendation for the path forward on Building 76 has been updated to move forward to RI.	
nd adding a sentence explaining the developing nature of PFAS regulation going forward, the project will use the most recent/relevant regulatory available.	A sentence was added at the end of Section 1 stating that the conclusions and recommendations of the SI Report reflect the current status of evolving PFAS regulation and DoD Policy.		
a reference to the 2017 sample report/data for the primary drinking water ll. ng level exceedances observed in the August 2023 Building 76 sample data dditional investigation into the private drinking water well situation. This y be carried out in the RI, but this section of the SI Report should include a escription of the next steps for determining whether a potential exposure to ater receptors exists. EPA expects some of those steps will include of private wells off-base.	a) A reference to the 2017 PFAS sample data for the upgradient Town of Keyport well has been added to the SI text; the quantitative results were provided directly to the NAVFAC NW RPM via email. b) Section 2.3 has been updated following the additional investigation activities at Building 76. Additional data have confirmed the previous conclusion that, per Navy Policy, since 1) there were no detected concentrations of PFOS or PFOA above 70 ng/L in the on-Base monitoring wells and, 2) based on the estimated groundwater flow direction primarily to the north with the potential off-base drinking water wells cross-gradient from Building 76, no potentially complete exposure pathway was identified from Building 76 to off-Base drinking water wells.		b) Section 2.3 has been updated Building 76. Additional data have Navy Policy, since 1) there were above 70 ng/L in the on-Base mo groundwater flow direction prim drinking water wells cross-gradie exposure pathway was identifie wells. Revised text in Section 2.3 uncertainties regarding groundw of the site's proximity to the Bas exceedances of groundwater RSL recommendation for the Buildin RI. Additional data pertaining to be obtained during the RI, but fo not warranted based on the info

Comment	Response	Updated Response 11/27/2023	U
s section to describe what, if any, tribal coordination was performed with e archaeological monitoring.	Text has been added to describe the tribal review and concurrence with the Section 106 Consultation for the PFAS SI. The Navy's initiation of the Section 106 consultation for proposed SI investigation was provided to the Suquamish tribe on April 26, 2022, for a 30-day review period. On May 20, 2022, the Suquamish Tribal Historic Preservation Officer provided concurrence with the Section 106 Consultation, and concurred with the Navy determination of No Historic Properties Affected, with the requirement for monitoring of boring activities by a professional archaeologist.		
some deviations have this information in the "Rationale" column of Table 3- a summary statement or discussion about the impacts, or lack thereof, to ty and usability based on the deviations to the SAP.	A statement has been added to the introductory text of Section 3.17 to state that the SAP deviations described in Table 3-1 were evaluated and have no impacts on the SI data quality or usability.		
istance and direction that Sampling Station NBKK-B76-MW04 was moved ocation presented in the SAP. Also add the distance that Sampling Station -MW01 was moved.	Distances and direction of as-installed to proposed monitoring well locations for NBKK-B76-MW04 and NBKK-CF1-MW01 have been added to Table 3-1.		
rstands the Table 3-1 rationale for completing Human Health Risk s (HHRS) for each SI site, namely the need for a quick turnaround time, but e the purpose of these screenings in this phase. The SAP states that the nly performed if useful for site management decisions. Unless there are cumstances, RSLs are the values against which to screen PFAS data, and the s not the appropriate time to eliminate PFAS compounds from tion as chemicals of potential concern (COPC). In this SI Report, the HHRS ange the RI recommendations for any sites but seems to imply that some pounds do not warrant further consideration. At a minimum, EPA expects se to consider all eight PFAS compounds included in the 2023 ASD Memo, cts the RI to include a comprehensive, site-specific risk assessment. on must include an explanation that the purpose of the HHRS is not to PFAS compounds from consideration in the RI phase and that at minimum, FAS compounds will be considered, in accordance with the 2023 ASD ee related comments on the Table 4 series and Appendix L.	A sentence has been added to Section 4.1 to state that the HHRS is not intended for eliminating individual PFAS as COPCs from moving forward to the RI phase and for sites moving forward to an RI, at a minimum all eight PFAS compounds included in the 2023 DoD guidance will be investigated and a site-specific risk assessment conducted. The added text clarifies that this applies to each Conclusions and Recommendations portion in the Section 4 tables.		
usions and Recommendations section of each of these tables include s of the results of the HHRS, identifying COPCs. However, some compounds fied as COPCs (for example PFHxS and PFNA in Table 4-4) also have level exceedances. This did not change the recommendations to proceed to areas but incorrectly implies that compounds not identified as COPCs do e further consideration. Clarify that the HHRS results do not eliminate any pounds from consideration in the RI.	Please see the response to comment #10.		
hether the Building-1006 fire suppression system still contains AFFF. Given wo releases were accidental discharges, understanding the risks of another ase based on system configuration is relevant.	Per updated information provided by the NBK Keyport Hazardous Waste Program Manager, the fire suppression system was removed and replaced at Building 1006 in 2020. The new system is currently connected to a water (sprinkler) system, and AFFF was not put into the system. Existing AFFF from the former suppression system was disposed of off-Base in 2023, and the two underground storage tanks containing trace AFFF were pumped out in September 2023. Text has been added to the 'Description and Operational History and Potential for PFAS Release' section of Table 4-4 to reflect the current operational status of fire suppression at Building 1006.		

Comment	Response	Updated Response 11/27/2023	U
rstands the SI SAP did not include sediment investigation as one of the two , and that sediment sample data did not impact the recommendation to o RI for the Van Meter Road Spill/Drum Storage Area. However, this table rify that the sediment data was screened against soil RSLs so as not to false sense of security regarding possible PFAS contamination in sediment. RSLs may be significantly different from the established soil RSLs.	Comment noted. A footnote has been added to Table 4-10 to indicate that sediment data were screened against the soil RSLs, as requested in comment #15.		
nd changing the row labels from "Project Action Limits" to "Screening similar, for consistency with the language used in the rest of the SI Report. first use of "Project Action Limits" in the text.	The row labels in Table 4-8, 4-9, and 4-10 and the notes in Tables 4-8 and 4-9 have been updated as requested by reviewer to reference Screening Levels rather than Project Action Limits.		
e to clarify that sediment data were evaluated against the soil RSLs in this SI	A footnote has been added to Table 4-10 as requested by reviewer, stating 'Sediment analytical results were screened against residential scenario soil screening levels presented in the May 2023 Regional Screening Level Table.'		
on states: "*If the cumulative HI for a target organ/effect was greater than nalytes significantly contributing to the HI were identified as preliminary ealth COPCs for further evaluation.* " At a minimum, all eight PFAS ds identified in the 2023 ASD Memo require further evaluation in the RI, s of the results of this HHRS. Clarify this fact in Appendix L.	For clarification, if the HHRS analysis shows no exceedance of the target HI of 0.5, the site is not carried forward to the RI. A sentence has been added to Appendix L Section 2 that the HHRS is not intended for eliminating individual PFAS as COPCs from moving forward to the RI phase at the site level. At sites moving forward to an RI, at a minimum all eight PFAS compounds included in the 2023 DoD technical guidance will be investigated and a site-specific risk assessment conducted.		

a Consistent Methodology for the Analysis of Per- and Polyfluoroalkyl Substances in Matrices Other than Drinking Water. August.
Substances within the Department of Defense Cleanup Program. August.