

# Appendices

## **APPENDIX 1: WATER PARAMETER DATA SHEETS**

Maryland Department of the Environment  
PFAS Pilot Study  
2020

61620

L2023415

### Field Data Collection Sheet

Date: 6/4/2020  
Time: 9:02 AM

**SAMPLING TEAM**  
C. Wose  
R. Snader

**LOCATION**  
Water Body: St. Mary's River  
Bottle #: ~~Field Blank~~ T4 -01  
GPS Coordinates: Latitude: \_\_\_\_\_  
Longitude: \_\_\_\_\_

**DATA PARAMETERS**  
Air Temp: 26 °F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1 / 20  
Water Temp (°C): 21.2 / 19.1  
Cond. (µS/cm): 17700 / 19900  
D.O (mg/L): 9.1 / 5.0  
pH: 8.4 / 7.9  
Salinity: 10.5 / 11.9  
  
CC-01

**ENVIRONMENTAL CONDITIONS**  
WEATHER CODE: 1  
0 Clear                                5 Drizzle  
1 Partly Cloudy                      6 Rain  
2 Continuous Clouds                7 Snow or Snow w/ Rain  
3 Blowing Snow/Sand                8 Showers  
4 Fog/Haze                              9 Thunder Storms  
  
WIND DIRECTION CODE: 8  
1 N                                        5 S  
2 NE                                      6 SW  
3 E                                        7 W  
4 SE                                      8 NW  
Wind Velocity: 1 mph  
  
TIDE CODE: 3  
1 Ebb                                      3 Flood  
2 Slack After Ebb                      4 Slack After Flood  
  
Rain within the last 48 hours? (circle) YES  NO  
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle)  YES    NO  
Media Sampled (circle one): Oysters  **Water**   
Number of oysters collected: \_\_\_\_\_  
With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From: | To:                 | Date:               | Time:            |
|-------------------|---------------------|---------------------|------------------|
| Ryan Snader - MDE | Courier             | 6/5/2020            | 12:00            |
| <del>M.P.A.</del> | <del>Box</del>      | <del>6-5-2020</del> | <del>1:00</del>  |
| <del>M.P.A.</del> | <del>6-5-2020</del> | <del>6/5/20</del>   | <del>2:00</del>  |
| <del>M.P.A.</del> | <del>6/6/20</del>   | <del>6/6/20</del>   | <del>02:05</del> |

rec: WILLIAM  
6/4/2020

Field Data Collection Sheet

Date: 06/04/2020  
Time: 09:10 AM

**SAMPLING TEAM**  
MCKAY / HINER

**LOCATION**  
Water Body: St. Inigoes Cr.  
Bottle #: T-5 -02  
GPS Coordinates: Latitude: T-5 U3 - T5-N1  
Longitude: \_\_\_\_\_

**DATA PARAMETERS**  
Air Temp: 25 °F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1 / 13  
Water Temp (°C): 22.5 / 22.4  
Cond. (µS/cm): 18600 / 19200  
D.O (mg/L): 9.8 / 9.2  
pH: 8.4 / 8.2  
Salinity: 11.0 / 11.5  
Readings @ T5-W2

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
0 Clear  
① Partly Cloudy  
2 Continuous Clouds  
3 Blowing Snow/Sand  
4 Fog/Haze  
5 Drizzle  
6 Rain  
7 Snow or Snow w/ Rain  
8 Showers  
9 Thunder Storms  
**WIND DIRECTION CODE:** 6  
1 N  
2 NE  
3 E  
4 SE  
5 S  
6 SW  
7 W  
8 NW  
Wind Velocity: 01  
**TIDE CODE:** 3  
1 Ebb  
2 Slack After Ebb  
③ Flood  
4 Slack After Flood  
Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle) YES NO  
Media Sampled (circle one): Oysters Water  
Number of oysters collected: \_\_\_\_\_  
With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:    | Time: |
|--------------------|--------------------|----------|-------|
| Ryan Snaders MDE   | Courier            | 6/5/2020 | 12:00 |
| <u>[Signature]</u> |                    | 6/5/2020 | 1:00  |
| <u>[Signature]</u> | <u>[Signature]</u> | 6/5/20   | 2:00  |
| <u>[Signature]</u> |                    | 6/6/20   | 02:05 |

Field Data Collection Sheet

Date: 6/4/20  
Time: 900

**SAMPLING TEAM**  
Santana  
Klein

**LOCATION**  
Water Body: St Marys  
Bottle #: T3  
GPS Coordinates: Latitude: 38 08 21.2  
Longitude: 76 27 22.9

**DATA PARAMETERS**  
Air Temp: 24 °F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1 / 4  
Water Temp (°C): 22.6 / 21.6  
Cond. (µS/cm): 1  
D.O (mg/L): 8.73 / 9.21  
pH: 8.31 / 8.33  
Salinity: 10.76 / 10.8

**ENVIRONMENTAL CONDITIONS**  
WEATHER CODE: 0  
0 Clear 5 Drizzle  
1 Partly Cloudy 6 Rain  
2 Continuous Clouds 7 Snow or Snow w/ Rain  
3 Blowing Snow/Sand 8 Showers  
4 Fog/Haze 9 Thunder Storms  
WIND DIRECTION CODE: 4  
1 N 5 S  
2 NE 6 SW  
3 E 7 W  
4 SE 8 NW  
Wind Velocity: 3  
TIDE CODE: 3  
1 Ebb 3 Flood  
2 Slack After Ebb 4 Slack After Flood  
Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle) YES NO  
Media Sampled (circle one): Oysters Water  
Number of oysters collected: \_\_\_\_\_  
With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From: | To:           | Date:         | Time:       |
|-------------------|---------------|---------------|-------------|
| Ryan Smadar - MDE | Courser       | 6/5/2020      | 12:00 pm    |
| <u>1800</u>       | <u>MPH</u>    | <u>6/5/20</u> | <u>1800</u> |
| <u>UPS AAL</u>    | <u>2020</u>   | <u>6/5/20</u> | <u>2000</u> |
| <u>2000</u>       | <u>6/6/20</u> | <u>6/5/20</u> | <u>2000</u> |
| <u>6/6/20</u>     | <u>6/6/20</u> | <u>6/5/20</u> | <u>2000</u> |

*Handwritten notes:*  
6/6/20 6:00

Maryland Department of the Environment  
 PFAS Pilot Study  
 2020

Field Data Collection Sheet

Date: 4 JUNE 2020  
 Time: 10:10 am

**SAMPLING TEAM**  
NELSON  
HCMANUS

**LOCATION**  
 Water Body: FISHING BAY  
 Bottle #: FIELD BLANK -04  
 GPS Coordinates: Latitude: 38°25'08.4"  
 Longitude: -76°01'10.8"

**DATA PARAMETERS**  
 Air Temp: 29.6 °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 9  
 Water Temp (°C): 23.3 / 21.3  
 Cond. (µS/cm): 22190 / 22400  
 D.O (mg/L): 08.6 / 08.4  
 pH: 08.1 / 08.1  
 Salinity: 13.3 / 13.5

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 4  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
 WIND DIRECTION CODE: 5  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 1  
 TIDE CODE: 2  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: 0  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:  | To:              | Date:      | Time: |
|--------------------|------------------|------------|-------|
| Ryan Saeder MOE    | Courier          | 6/5/20     | 12:00 |
| <i>[Signature]</i> | AAE 18:00        | 6-5-20     | 18:00 |
| <i>[Signature]</i> | AAE 6:520 2030   | AAE 6/5/20 | 2200  |
| <i>[Signature]</i> | AAE 6/5/20 08:05 | 6/5/20     | 08:05 |

L2028494

Field Data Collection Sheet

Date: 7/7/2020  
Time: 6:05 AM

**SAMPLING TEAM**  
R. Snader  
C. Wose

**LOCATION**  
Water Body: Trip Blank  
Bottle #: T004  
GPS Coordinates: Latitude: \_\_\_\_\_  
Longitude: \_\_\_\_\_

**DATA PARAMETERS**  
Air Temp: 25.0 °F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1 / \_\_\_\_\_  
Water Temp (°C): 1 / \_\_\_\_\_  
Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
D.O (mg/L): 1 / \_\_\_\_\_  
pH: 1 / \_\_\_\_\_  
Salinity: 1 / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**  
WEATHER CODE: 1  
0 Clear  
1 Partly Cloudy  
2 Continuous Clouds  
3 Blowing Snow/Sand  
4 Fog/Haze  
5 Drizzle  
6 Rain  
7 Snow or Snow w/ Rain  
8 Showers  
9 Thunder Storms  
WIND DIRECTION CODE: 5  
1 N  
2 NE  
3 E  
4 SE  
5 S  
6 SW  
7 W  
8 NW  
Wind Velocity: 3  
TIDE CODE: 1  
1 Ebb  
2 Slack After Ebb  
3 Flood  
4 Slack After Flood  
Rain within the last 48 hours? (circle)  YES  NO  
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle)  YES  NO  
Media Sampled (circle one): Oysters   Water  
Number of oysters collected: \_\_\_\_\_  
With (W) or Without (WD) oyster liquor \_\_\_\_\_



| CHAIN OF CUSTODY  |             |        |                             |
|-------------------|-------------|--------|-----------------------------|
| Transferred From: | To:         | Date:  | Time:                       |
| Ryan Snader       | Adam Wose   | 7/7/20 | 9:45 AM                     |
| Adam Wose         | Ryan Snader | 7/7/20 | <del>9:45 AM</del> 10:45 AM |
|                   |             |        |                             |

L2028494

Field Data Collection Sheet

Date: 7/7/2020  
 Time: 8:22 AM

**SAMPLING TEAM**  
R. Snader  
C. Wose

**LOCATION**  
 Water Body: Smith Creek  
 Bottle #: FB-6A  
 GPS Coordinates: Latitude: 38 07 31.4  
 Longitude: 76 24 44.9

**DATA PARAMETERS**  
 Air Temp: 26 °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): 1  
 D.O (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
 WIND DIRECTION CODE: 5  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 6  
 TIDE CODE: 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor: \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:         | Time:           |
|--------------------|--------------------|---------------|-----------------|
| <u>Ryan Snader</u> | <u>Adam Wose</u>   | <u>7/7/20</u> | <u>9:45 AM</u>  |
| <u>Adam Wose</u>   | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>10:45 AM</u> |
|                    |                    |               |                 |



L2028494

Maryland Department of the Environment  
PFAS Pilot Study  
2020

Field Data Collection Sheet

Date: 7/7/2020  
Time: 8:22 AM

**SAMPLING TEAM**  
R. Snader  
C. Wose

**LOCATION**  
Water Body: Smith Creek  
Bottle #: SC-W1  
GPS Coordinates: Latitude: 38 07 31.4  
Longitude: 76 24 44.9

**DATA PARAMETERS**  
Air Temp: 26 °F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1 / 12  
Water Temp (°C): 29.5 / 29.5  
Cond. (µS/cm): 18300 / 18200  
D.O (mg/L): 6.8 / 6.7  
pH: 8.4 / 8.4  
Salinity: 10.7 / 10.7

**ENVIRONMENTAL CONDITIONS**  
WEATHER CODE: 1  
0 Clear  
1 Partly Cloudy  
2 Continuous Clouds  
3 Blowing Snow/Sand  
4 Fog/Haze  
5 Drizzle  
6 Rain  
7 Snow or Snow w/ Rain  
8 Showers  
9 Thunder Storms  
WIND DIRECTION CODE: 5  
1 N  
2 NE  
3 E  
4 SE  
5 S  
6 SW  
7 W  
8 NW  
Wind Velocity: 6  
TIDE CODE: 1  
1 Ebb  
2 Slack After Ebb  
3 Flood  
4 Slack After Flood  
Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle) YES NO  
Media Sampled (circle one): Oysters Water  
Number of oysters collected: \_\_\_\_\_  
With (W) or Without (WO) oyster liquor: \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:         | Time:           |
|--------------------|--------------------|---------------|-----------------|
| <u>Ryan Snader</u> | <u>Adam Wose</u>   | <u>7/7/20</u> | <u>9:45 AM</u>  |
| <u>Adam Wose</u>   | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>10:45 PM</u> |
|                    |                    |               |                 |
|                    |                    |               |                 |

L2028494

Field Data Collection Sheet

Date: 7/7/2020  
Time: ~~8:22 AM~~  
8:27 AM

**SAMPLING TEAM**  
R. Snader  
C. Wose

**LOCATION**  
Water Body: Smith Creek  
Bottle #: SC-WIR  
GPS Coordinates: Latitude: 380731.4  
Longitude: 762444.9

**DATA PARAMETERS**  
Air Temp: 26 °F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1  
Water Temp (°C): 1  
Cond. (µS/cm): 1  
D.O (mg/L): 1  
pH: 1  
Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
WEATHER CODE: 1  
0 Clear  
1 Partly Cloudy  
2 Continuous Clouds  
3 Blowing Snow/Sand  
4 Fog/Haze  
5 Drizzle  
6 Rain  
7 Snow or Snow w/ Rain  
8 Showers  
9 Thunder Storms  
WIND DIRECTION CODE: 5  
1 N  
2 NE  
3 E  
4 SE  
5 S  
6 SW  
7 W  
8 NW  
Wind Velocity: 6  
TIDE CODE: 1  
1 Ebb  
2 Slack After Ebb  
3 Flood  
4 Slack After Flood  
Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle) YES NO  
Media Sampled (circle one): Oysters Water  
Number of oysters collected: \_\_\_\_\_  
With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:         | Time:        |
|--------------------|--------------------|---------------|--------------|
| <u>Ryan Snader</u> | <u>Adam Wose</u>   | <u>7/7/20</u> | <u>9:45</u>  |
| <u>Adam Wose</u>   | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>10:45</u> |
|                    |                    |               |              |

L2028494

Field Data Collection Sheet

Date: 7/7/2020  
Time: 8:44Am

**SAMPLING TEAM**  
R. Snader  
C. Wose

**LOCATION**  
Water Body: St. Mary's River  
Bottle #: FB-4A  
GPS Coordinates: Latitude: 38 06 38.5  
Longitude: 76 27 43.4

**DATA PARAMETERS**  
Air Temp: 26 °C/°F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1 / 1  
Water Temp (°C): 1  
Cond. (µS/cm): 1  
D.O (mg/L): 1  
pH: 1  
Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
0 Clear                                 5 Drizzle  
1 Partly Cloudy                         6 Rain  
2 Continuous Clouds                     7 Snow or Snow w/ Rain  
3 Blowing Snow/Sand                     8 Showers  
4 Fog/Haze                                 9 Thunder Storms  
**WIND DIRECTION CODE:** 5  
1 N   5 S  
2 NE                                       6 SW  
3 E   7 W  
4 SE                                       8 NW  
**TIDE CODE:** 1  
1 Ebb                                       3 Flood  
2 Slack After Ebb                         4 Slack After Flood  
Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle) YES NO  
Media Sampled (circle one): Oysters Water  
Number of oysters collected: \_\_\_\_\_  
With (W) or Without (WD) oyster liquor \_\_\_\_\_



| <b>CHAIN OF CUSTODY</b> |                    |               |              |
|-------------------------|--------------------|---------------|--------------|
| Transferred From:       | To:                | Date:         | Time:        |
| <u>Ryan Snader</u>      | <u>Adam Wose</u>   | <u>7/7/20</u> | <u>9:45</u>  |
| <u>Adam Wose</u>        | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>10:45</u> |
|                         |                    |               |              |

L2028494

Field Data Collection Sheet

Date: 7/7/2020  
Time: 8:44 AM

**SAMPLING TEAM**  
Ryan Snader  
C. Wose

**LOCATION**  
Water Body: St. Mary's River  
Bottle #: T4-W3  
GPS Coordinates: Latitude: 38 06 38.5  
Longitude: 76 27 43.4

**DATA PARAMETERS**  
Air Temp: 26.0 °F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1 / 1  
Water Temp (°C): 1  
Cond. (µS/cm): 1  
D.O (mg/L): 1  
pH: 1  
Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
0 Clear  
1 Partly Cloudy  
2 Continuous Clouds  
3 Blowing Snow/Sand  
4 Fog/Haze  
5 Drizzle  
6 Rain  
7 Snow or Snow w/ Rain  
8 Showers  
9 Thunder Storms  
**WIND DIRECTION CODE:** 5  
1 N  
2 NE  
3 E  
4 SE  
5 S  
6 SW  
7 W  
8 NW  
Wind Velocity: 6  
**TIDE CODE:** 1  
1 Ebb  
2 Slack After Ebb  
3 Flood  
4 Slack After Flood  
Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle) YES NO  
Media Sampled (circle one): Oysters Water  
Number of oysters collected: \_\_\_\_\_  
With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:         | Time:        |
|--------------------|--------------------|---------------|--------------|
| <u>Ryan Snader</u> | <u>Adam Wose</u>   | <u>7/7/20</u> | <u>9:45</u>  |
| <u>Adam Wose</u>   | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>10:45</u> |
|                    |                    |               |              |

Maryland Department of the Environment  
PFAS Pilot Study  
2020

L202 8494

### Field Data Collection Sheet

Date: 7/7/2020  
Time: 8:52 AM

**SAMPLING TEAM**  
R. Snader  
C. Wose

**LOCATION**  
Water Body: St. Mary's River  
Bottle #: T4-W2  
GPS Coordinates: Latitude: 38 06 28.5  
Longitude: 76 26 33.0

**DATA PARAMETERS**  
Air Temp: 26 °F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1 / 1  
Water Temp (°C): 1  
Cond. (µS/cm): 1  
D.O (mg/L): 1  
pH: 1  
Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
WEATHER CODE: 1  
0 Clear  
1 Partly Cloudy  
2 Continuous Clouds  
3 Blowing Snow/Sand  
4 Fog/Haze  
5 Drizzle  
6 Rain  
7 Snow or Snow w/ Rain  
8 Showers  
9 Thunder Storms  
WIND DIRECTION CODE: 5  
1 N  
2 NE  
3 E  
4 SE  
5 S  
6 SW  
7 W  
8 NW  
Wind Velocity: 6  
TIDE CODE: 1  
1 Ebb  
2 Slack After Ebb  
3 Flood  
4 Slack After Flood  
Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle) YES NO  
Media Sampled (circle one): Oysters Water  
Number of oysters collected: \_\_\_\_\_  
With (W) or Without (WO) oyster liquor: \_\_\_\_\_



| CHAIN OF CUSTODY   |                    |               |              |
|--------------------|--------------------|---------------|--------------|
| Transferred From:  | To:                | Date:         | Time:        |
| <u>Ryan Snader</u> | <u>Adam Wose</u>   | <u>7/7/20</u> | <u>9:45</u>  |
| <u>Adam Wose</u>   | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>10:45</u> |
|                    |                    |               |              |

L202 8494

Field Data Collection Sheet

Date: 7/7/2020  
 Time: 9:04 AM

**SAMPLING TEAM**  
R. Snader  
C. Wose

**LOCATION**  
 Water Body: St. Mary's River  
 Bottle #: CC-W1  
 GPS Coordinates: Latitude: 38 06 34.9  
 Longitude: 76 25 44.9

**DATA PARAMETERS**  
 Air Temp: 26 °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 13  
 Water Temp (°C): 28 / 28  
 Cond. (µS/cm): 17800 / 17800  
 D.O (mg/L): 7.3 / 7.1  
 pH: 8.4 / 8.4  
 Salinity: 10.4 / 10.4

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
 WIND DIRECTION CODE: 5  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 6  
 TIDE CODE: 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:         | Time:        |
|--------------------|--------------------|---------------|--------------|
| <u>Ryan Snader</u> | <u>Adam Wose</u>   | <u>7/7/20</u> | <u>9:45</u>  |
| <u>Adam Wose</u>   | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>10:45</u> |
|                    |                    |               |              |

L2028494

**Field Data Collection Sheet**

Date: 7/7/2020  
 Time: 8:59 AM

**SAMPLING TEAM**  
R. Snader  
C. Wose

**LOCATION**  
 Water Body St. Mary's River  
 Bottle #: T4-W1  
 GPS Coordinates: Latitude: 38 06 22.9  
 Longitude: 76 25 27.3

**DATA PARAMETERS**  
 Air Temp: 26 °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): 1  
 D.O (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear                      5 Drizzle  
 1 Partly Cloudy          6 Rain  
 2 Continuous Clouds      7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand      8 Showers  
 4 Fog/Haze                  9 Thunder Storms  
 WIND DIRECTION CODE: 5  
 1 N                              5 S  
 2 NE                            6 SW  
 3 E                              7 W  
 4 SE                            8 NW  
 Wind Velocity: 6  
 TIDE CODE: 1  
 1 Ebb                            3 Flood  
 2 Slack After Ebb          4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:         | Time:        |
|--------------------|--------------------|---------------|--------------|
| <u>Ryan Snader</u> | <u>Adam Wose</u>   | <u>7/7/20</u> | <u>9:45</u>  |
| <u>Adam Wose</u>   | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>10:45</u> |
|                    |                    |               |              |

L2028494

Field Data Collection Sheet

Date: 7/7/2020  
 Time: 9:14 AM

**LOCATION**  
 Water Body: St. Mary's River  
 Bottle #: FB-8C  
 GPS Coordinates: Latitude: 38 07 47.3  
 Longitude: 76 26 22.4

**SAMPLING TEAM**  
R. Snader  
C. Wose

**DATA PARAMETERS**  
 Air Temp: 26 °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): 1  
 D.O (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear                      5 Drizzle  
 1 Partly Cloudy          6 Rain  
 2 Continuous Clouds      7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand      8 Showers  
 4 Fog/Haze                  9 Thunder Storms  
 WIND DIRECTION CODE: 5  
 1 N                              5 S  
 2 NE                            6 SW  
 3 E                              7 W  
 4 SE                            8 NW  
 Wind Velocity: 6  
 TIDE CODE: 1  
 1 Ebb                            3 Flood  
 2 Slack After Ebb          4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:         | Time:        |
|--------------------|--------------------|---------------|--------------|
| <u>Ryan Snader</u> | <u>Adam Wose</u>   | <u>7/7/20</u> | <u>9:45</u>  |
| <u>Adam Wose</u>   | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>10:45</u> |
|                    |                    |               |              |



L2028494

Field Data Collection Sheet

Date: 7/7/2020  
Time: 9:14 AM

**LOCATION**  
Water Body St. Mary's River  
Bottle #: WFDS-W6  
GPS Coordinates: Latitude: 38 07 47.3  
Longitude: 76 26 22.4

**SAMPLING TEAM**  
R. Snader  
C. Wose

**DATA PARAMETERS**  
Air Temp: 26.0 / F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 2 / 1  
Water Temp (°C):      /       
Cond. (µS/cm):      /       
D.O (mg/L):      /       
pH:      /       
Salinity:      /     

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
0 Clear                                 5 Drizzle  
1 Partly Cloudy                       6 Rain  
2 Continuous Clouds                 7 Snow or Snow w/ Rain  
3 Blowing Snow/Sand                 8 Showers  
4 Fog/Haze                              9 Thunder Storms  
**WIND DIRECTION CODE:** 5  
1 N                                       5 S  
2 NE                                     6 SW  
3 E                                       7 W  
4 SE                                     8 NW  
**TIDE CODE:** 1  
1 Ebb                                     3 Flood  
2 Slack After Ebb                     4 Slack After Flood  
Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle) YES NO  
Media Sampled (circle one): Oysters Water  
Number of oysters collected:       
With (W) or Without (WO) oyster liquor     



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:         | Time:        |
|--------------------|--------------------|---------------|--------------|
| <u>Ryan Snader</u> | <u>Adam Wose</u>   | <u>7/7/20</u> | <u>9:45</u>  |
| <u>Adam Wose</u>   | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>10:45</u> |
|                    |                    |               |              |
|                    |                    |               |              |

L2028494

Field Data Collection Sheet

Date: 7/7/2020  
 Time: 9:20 AM

**SAMPLING TEAM**  
R. Snader  
C. Wose

**LOCATION**  
 Water Body: St. Mary's River  
 Bottle #: WFDS - W5  
 GPS Coordinates: Latitude: 38 07 52.5  
 Longitude: 76 26 11.3

**DATA PARAMETERS**  
 Air Temp: 26 °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): 1  
 D.D (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear                      5 Drizzle  
 1 Partly Cloudy          6 Rain  
 2 Continuous Clouds      7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand      8 Showers  
 4 Fog/Haze                  9 Thunder Storms  
 WIND DIRECTION CODE: 5  
 1 N                              5 S  
 2 NE                            6 SW  
 3 E                              7 W  
 4 SE                            8 NW  
 Wind Velocity: 6  
 TIDE CODE: 1  
 1 Ebb                            3 Flood  
 2 Slack After Ebb          4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor: \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:         | Time:        |
|--------------------|--------------------|---------------|--------------|
| <u>Ryan Snader</u> | <u>Adam Wose</u>   | <u>7/7/20</u> | <u>9:45</u>  |
| <u>Adam Wose</u>   | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>10:45</u> |
|                    |                    |               |              |

L2028494

Field Data Collection Sheet

Date: 7/7/2020  
 Time: 10:00

**SAMPLING TEAM**  
C. Wose

**LOCATION**  
 Water Body: \_\_\_\_\_  
 Bottle #: FB-WWEFF  
 GPS Coordinates: Latitude: \_\_\_\_\_  
 Longitude: \_\_\_\_\_

**DATA PARAMETERS**  
 Air Temp: \_\_\_\_\_ °C / °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / \_\_\_\_\_  
 Water Temp (°C): 1 / \_\_\_\_\_  
 Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
 D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
 pH: 1 / \_\_\_\_\_  
 Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
 0 Clear                      5 Drizzle  
 1 Partly Cloudy            6 Rain  
 2 Continuous Clouds      7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand      8 Showers  
 4 Fog/Haze                  9 Thunder Storms  
**WIND DIRECTION CODE:** 5  
 1 N                              5 S  
 2 NE                            6 SW  
 3 E                              7 W  
 4 SE                            8 NW  
 Wind Velocity: 6  
**TIDE CODE:** 1  
 1 Ebb                            3 Flood  
 2 Slack After Ebb            4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Dysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:         | Time:        |
|--------------------|--------------------|---------------|--------------|
| <u>Ryan Snader</u> | <u>Adam Wose</u>   | <u>7/7/20</u> | <u>9:45</u>  |
| <u>Adam Wose</u>   | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>10:45</u> |
|                    |                    |               |              |
|                    |                    |               |              |

L2028494

Field Data Collection Sheet

Date: 7/7/2020  
Time: 10:38

**LOCATION**

Water Body: \_\_\_\_\_  
Bottle #: WWTP-EFF  
GPS Coordinates: Latitude: \_\_\_\_\_  
Longitude: \_\_\_\_\_

**SAMPLING TEAM**  
C. Wose

**DATA PARAMETERS**

Air Temp: \_\_\_\_\_ °C / °F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1 / \_\_\_\_\_  
Water Temp (°C): \_\_\_\_\_ / \_\_\_\_\_  
Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
pH: \_\_\_\_\_ / \_\_\_\_\_  
Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**

WEATHER CODE: 1

0 Clear  
1 Partly Cloudy  
2 Continuous Clouds  
3 Blowing Snow/Sand  
4 Fog/Haze  
5 Drizzle  
6 Rain  
7 Snow or Snow w/ Rain  
8 Showers  
9 Thunder Storms

WIND DIRECTION CODE: S

1 N  
2 NE  
3 E  
4 SE  
5 S  
6 SW  
7 W  
8 NW

Wind Velocity: 6

TIDE CODE: 1

1 Ebb  
2 Slack After Ebb  
3 Flood  
4 Slack After Flood

Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle) YES NO  
Media Sampled (circle one): Oysters Water  
Number of oysters collected: \_\_\_\_\_  
With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:         | Time:        |
|--------------------|--------------------|---------------|--------------|
| <u>Ryan Snader</u> | <u>Adam Wose</u>   | <u>7/7/20</u> | <u>9:45</u>  |
| <u>Adam Wose</u>   | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>10:45</u> |
|                    |                    |               |              |

L262 8495

Maryland Department of the Environment  
PFAS Pilot Study  
2020

Field Data Collection Sheet

Date: 07-07-2020  
Time: 10:02 am

**SAMPLING TEAM**  
McMAHONS  
Nelson

**LOCATION**  
Water Body: FLSHING BAY  
Bottle #: FB - W1  
GPS Coordinates: Latitude: 38° 25' 08.4" <sup>N</sup>  
Longitude: 76° 01' 10.8" <sup>W</sup>

**DATA PARAMETERS**  
Air Temp: 27 °F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1 / 8  
Water Temp (°C): 28.3 / 28.2  
Cond. (µS/cm): 23200 / 23210  
D.O (mg/L): 0.7.0 / 6.8  
pH: 0.7.9 / 7.8  
Salinity: 14.0 / 14.0

**ENVIRONMENTAL CONDITIONS**  
WEATHER CODE: 1  
1 Clear  
2 Partly Cloudy  
3 Continuous Clouds  
4 Blowing Snow/Sand  
5 Fog/Haze  
6 Drizzle  
7 Rain  
8 Snow or Snow w/ Rain  
9 Showers  
9 Thunder Storms  
WIND DIRECTION CODE: 5  
1 N  
2 NE  
3 E  
4 SE  
5 S  
6 SW  
7 W  
8 NW  
Wind Velocity: 12  
TIDE CODE: 1  
1 Ebb  
2 Slack After Ebb  
3 Flood  
4 Slack After Flood  
Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICE**  
Samples Iced? (circle) YES NO  
Media Sampled (circle one): Oysters Water  
Number of oysters collected: -  
With (W) or Without (WO) oyster liquor -



**CHAIN OF CUSTODY**

| Transferred From:    | To:                  | Date:             | Time:           |
|----------------------|----------------------|-------------------|-----------------|
| <u>ANNA McMAHONS</u> | <u>Barny Fairall</u> | <u>07-07-2020</u> | <u>10:30 am</u> |
| <u>Barny Fairall</u> | <u>Ryan Snader</u>   | <u>7-7-2020</u>   | <u>1:00 pm</u>  |
|                      |                      |                   |                 |

L-2028495

Maryland Department of the Environment  
 PFAS Pilot Study  
 2020

Field Data Collection Sheet

Date: 7-7-2020  
 Time: 10 02 AM

**SAMPLING TEAM**  
Walter Nelson

**LOCATION**  
 Water Body: Field Blank  
 Bottle #: FB 7A  
 GPS Coordinates: Latitude: 38° 25' 08.4"  
 Longitude: 76° 01' 10.8"

**DATA PARAMETERS**  
 Air Temp: 27 (C) / F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 8  
 Water Temp (°C): 28.3 / 28.2  
 Cond. (µS/cm): 23200 / 23210  
 D.O (mg/L): 7.0 / 6.8  
 pH: 7.9 / 7.8  
 Salinity: 14.0 / 14.0

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
**WIND DIRECTION CODE:** 5  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 12  
**TIDE CODE:** 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Dysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WD) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:    | To:                  | Date:         | Time:          |
|----------------------|----------------------|---------------|----------------|
| <u>Walter Nelson</u> | <u>Barry Fairall</u> | <u>7-7-20</u> | <u>1030 am</u> |
| <u>Barry Fairall</u> | <u>Ryan Snader</u>   | <u>7-7-20</u> | <u>1:00 pm</u> |
|                      |                      |               |                |

L2028495

Field Data Collection Sheet

Date: 07-07-2020  
Time: ~~10:02~~ am  
6:57 am

**SAMPLING TEAM**  
McManus  
NELSON

**LOCATION**  
Water Body: Trip Blank  
Bottle #: TB002  
GPS Coordinates: Latitude: 38° 25' 08.4" N  
Longitude: 76° 01' 10.8" W

**DATA PARAMETERS**  
Air Temp: 27 °C F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1 / 8  
Water Temp (°C): 28.3 / 28.2  
Cond. (µS/cm): 23200 / 23210  
D.O (mg/L): 7.0 / 6.8  
pH: 7.9 / 7.8  
Salinity: 14.0 / 14.0

**ENVIRONMENTAL CONDITIONS**  
WEATHER CODE: 1  
1 Clear 5 Drizzle  
2 Partly Cloudy 6 Rain  
3 Continuous Clouds 7 Snow or Snow w/ Rain  
3 Blowing Snow/Sand 8 Showers  
4 Fog/Haze 9 Thunder Storms  
WIND DIRECTION CODE: 5  
1 N 5 S  
2 NE 6 SW  
3 E 7 W  
4 SE 8 NW  
Wind Velocity: 12  
TIDE CODE: 1  
1 Ebb 3 Flood  
2 Slack After Ebb 4 Slack After Flood  
Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle) YES NO  
Media Sampled (circle one): Oysters Water  
Number of oysters collected: -  
With (W) or Without (WO) oyster liquor -



**CHAIN OF CUSTODY**

| Transferred From:     | To:                   | Date:             | Time:           |
|-----------------------|-----------------------|-------------------|-----------------|
| <u>AW McManus</u>     | <u>Barney Farrell</u> | <u>07-07-2020</u> | <u>10:30 am</u> |
| <u>Barney Farrell</u> | <u>Ryan Snader</u>    | <u>7-7-20</u>     | <u>1:00 pm</u>  |
|                       |                       |                   |                 |

Maryland Department of the Environment  
PFAS Pilot Study  
2020

### Field Data Collection Sheet

Date: 7/7/20  
 Time: 6:00 am

**LOCATION**  
 Water Body: Trip Blank  
 Bottle #: TB003  
 GPS Coordinates: Latitude: \_\_\_\_\_  
 Longitude: \_\_\_\_\_

**SAMPLING TEAM**  
Santana  
Klein

**DATA PARAMETERS**  
 Air Temp: \_\_\_\_\_ °C / °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 1  
 Water Temp (°C): \_\_\_\_\_ / \_\_\_\_\_  
 Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
 D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
 pH: \_\_\_\_\_ / \_\_\_\_\_  
 Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: \_\_\_\_\_  
 0 Clear                                5 Drizzle  
 1 Partly Cloudy                    6 Rain  
 2 Continuous Clouds            7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand            8 Showers  
 4 Fog/Haze                          9 Thunder Storms  
 WIND DIRECTION CODE: \_\_\_\_\_  
 1 N                                    5 S  
 2 NE                                 6 SW  
 3 E                                    7 W      Wind Velocity:   
 4 SE                                 8 NW  
 TIDE CODE: \_\_\_\_\_  
 1 Ebb                                 3 Flood  
 2 Slack After Ebb                4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES    NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES    NO  
 Media Sampled (circle one): Oysters    Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



| CHAIN OF CUSTODY       |                    |               |                |
|------------------------|--------------------|---------------|----------------|
| Transferred From:      | To:                | Date:         | Time:          |
| <u>Barbara Santana</u> | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>2:00 pm</u> |
|                        |                    |               |                |
|                        |                    |               |                |



Maryland Department of the Environment  
PFAS Pilot Study  
2020

Field Data Collection Sheet

Date: 7/7/20  
Time: 902

**SAMPLING TEAM**  
Santana  
Klein

**LOCATION**  
Water Body: St Marys River  
Bottle #: FB-1A  
GPS Coordinates: Latitude: 38° 11' 17" N  
Longitude: 76° 26' 16" W

**DATA PARAMETERS**

Air Temp: \_\_\_\_\_ °C / F  
Water Quality:  
**Surface/Bottom**

Depth (ft.): 1 / \_\_\_\_\_  
Water Temp (°C): \_\_\_\_\_ / \_\_\_\_\_  
Cond (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
pH: \_\_\_\_\_ / \_\_\_\_\_  
Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**

**WEATHER CODE:** \_\_\_\_\_

|  |                        |
|--|------------------------|
| 0 Clear  | 5 Drizzle              |
| <input checked="" type="radio"/> 1 Partly Cloudy | 6 Rain                 |
| 2 Continuous Clouds                              | 7 Snow or Snow w/ Rain |
| 3 Blowing Snow/Sand                              | 8 Showers              |
| 4 Fog/Haze                                       | 9 Thunder Storms       |

**WIND DIRECTION CODE:** \_\_\_\_\_

|      |      |               |
|------|------|---------------|
| 1 N  | 5 S  | Wind Velocity |
| 2 NE | 6 SW |               |
| 3 E  | 7 W  |               |
| 4 SE | 8 NW |               |

**TIDE CODE:** \_\_\_\_\_

|                   |                     |
|-------------------|---------------------|
| 1 Ebb             | 3 Flood             |
| 2 Slack After Ebb | 4 Slack After Flood |

Rain within the last 48 hours? (circle)  YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle)  YES NO  
 Media Sampled (circle one): Oysters  Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor: \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:      | To:                | Date:         | Time:          |
|------------------------|--------------------|---------------|----------------|
| <u>Barbara Santana</u> | <u>Ryan Snider</u> | <u>7/7/20</u> | <u>2:00 PM</u> |
|                        |                    |               |                |
|                        |                    |               |                |

Maryland Department of the Environment  
 PFAS Pilot Study  
 2020

Field Data Collection Sheet

Date: 7/7/20  
 Time: 902

**SAMPLING TEAM**  
Santana  
Klein

**LOCATION**  
 Water Body: St Marys River  
 Bottle #: T1-W1  
 GPS Coordinates: Latitude: 38° 11' 17" N  
 Longitude: 76° 26' 16" W

**DATA PARAMETERS**  
 Air Temp: 28 °C / °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 20  
 Water Temp (°C): 28.6 / 28.5  
 Cond. (µS/cm): 18560 / 18910  
 D.O (mg/L): 6.7 / 6.2  
 pH: 8.4 / 8.3  
 Salinity: 10.9 / 11.2

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
**WIND DIRECTION CODE:** S  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity 5  
**TIDE CODE:** 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:      | To:                | Date:         | Time:          |
|------------------------|--------------------|---------------|----------------|
| <u>Barbara Santana</u> | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>2:00 pm</u> |
|                        |                    |               |                |
|                        |                    |               |                |

Maryland Department of the Environment  
 PFAS Pilot Study  
 2020

Field Data Collection Sheet

Date: 7-7-20  
 Time: 9:17

**SAMPLING TEAM**  
Santana  
Klein

**LOCATION**  
 Water Body: St. Marys River  
 Bottle #: T1-W2  
 GPS Coordinates: Latitude: 39° 11' 18" N  
 Longitude: 76° 26' 27" W

**DATA PARAMETERS**

Air Temp \_\_\_\_\_ °C / F  
 Water Quality:  
**Surface/Bottom**

Depth (ft.): 1 / 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): 1  
 D.D (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**

**WEATHER CODE:** 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms

**WIND DIRECTION CODE:** 5  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW

Wind Velocity: 5

**TIDE CODE:** 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood

Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor: \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:      | To:                | Date:         | Time:          |
|------------------------|--------------------|---------------|----------------|
| <u>Barbara Santana</u> | <u>Ryan Snider</u> | <u>7/7/20</u> | <u>2:00 pm</u> |
|                        |                    |               |                |
|                        |                    |               |                |

Maryland Department of the Environment  
PFAS Pilot Study  
2020

### Field Data Collection Sheet

Date: 7/7/20  
 Time: 9:21

**SAMPLING TEAM**  
Santana  
Klein

**LOCATION**  
 Water Body: St Marys River  
 Bottle #: T1-WAR  
 GPS Coordinates: Latitude: 38° 11' 18" N  
 Longitude: 76° 26' 27" W

**DATA PARAMETERS**

Air Temp: \_\_\_\_\_ °C / °F  
 Water Quality:  
Surface/Bottom

Depth (ft.):    /     
 Water Temp (°C):    /     
 Cond. (µS/cm):    /     
 D.O (mg/L):    /     
 pH:    /     
 Salinity:    /   

**ENVIRONMENTAL CONDITIONS**

**WEATHER CODE:** 1

|                     |                        |
|---------------------|------------------------|
| 0 Clear             | 5 Drizzle              |
| 1 Partly Cloudy     | 6 Rain                 |
| 2 Continuous Clouds | 7 Snow or Snow w/ Rain |
| 3 Blowing Snow/Sand | 8 Showers              |
| 4 Fog/Haze          | 9 Thunder Storms       |

**WIND DIRECTION CODE:** 5

|      |      |
|------|------|
| 1 N  | 5 S  |
| 2 NE | 6 SW |
| 3 E  | 7 W  |
| 4 SE | 8 NW |

Wind Velocity 5

**TIDE CODE:** 1

|                   |                     |
|-------------------|---------------------|
| 1 Ebb             | 3 Flood             |
| 2 Slack After Ebb | 4 Slack After Flood |

Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected:     
 With (W) or Without (WO) oyster liquor   



| CHAIN OF CUSTODY       |                     |               |                |
|------------------------|---------------------|---------------|----------------|
| Transferred From:      | To:                 | Date:         | Time:          |
| <u>Barbara Santana</u> | <u>Ryan Snodder</u> | <u>7/7/20</u> | <u>2:00 pm</u> |
|                        |                     |               |                |
|                        |                     |               |                |

Maryland Department of the Environment  
PFAS Pilot Study  
2020

Field Data Collection Sheet

Date: 7/7/20  
Time: 9:27

**SAMPLING TEAM**  
Santana  
Klein

**LOCATION**  
Water Body St Marys River  
Bottle #: T1-W3  
GPS Coordinates: Latitude: 38° 11' 18" N  
Longitude: 76° 26' 38" W

**DATA PARAMETERS**  
Air Temp: \_\_\_\_\_ °C / °F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1 /  
Water Temp (°C): /  
Cond (µS/cm): /  
D.O (mg/L): /  
pH: /  
Salinity: /

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
0 Clear                      5 Drizzle  
1 Partly Cloudy          6 Rain  
2 Continuous Clouds    7 Snow or Snow w/ Rain  
3 Blowing Snow/Sand    8 Showers  
4 Fog/Haze                9 Thunder Storms  
**WIND DIRECTION CODE:** 5  
1 N                            5 S  
2 NE                        6 SW  
3 E                            7 W  
4 SE                        8 NW  
Wind Velocity S  
**TIDE CODE:** 1  
1 Ebb                        3 Flood  
2 Slack After Ebb        4 Slack After Flood  
Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle) YES NO  
Media Sampled (circle one): Oysters Water  
Number of oysters collected: -  
With (W) or Without (WO) oyster liquor -



**CHAIN OF CUSTODY**

| Transferred From:      | To:                | Date:         | Time:         |
|------------------------|--------------------|---------------|---------------|
| <u>Barbara Santana</u> | <u>Ruan Snader</u> | <u>7/7/20</u> | <u>2:00pm</u> |
|                        |                    |               |               |
|                        |                    |               |               |

Maryland Department of the Environment  
 PFAS Pilot Study  
 2020

Field Data Collection Sheet

Date: 7/7/20  
 Time: 943

**SAMPLING TEAM**  
Santana  
Klein

**LOCATION**  
 Water Body St Marys River  
 Bottle #: FB-3A  
 GPS Coordinates: Latitude: 38° 08' 19" N  
 Longitude: 76° 27' 32" W

**DATA PARAMETERS**  
 Air Temp: C/E  
 Water Quality:  
Surface/Bottom  
 Depth (ft.): 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): 1  
 D.O (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear 5 Drizzle  
 1 Partly Cloudy 6 Rain  
 2 Continuous Clouds 7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand 8 Showers  
 4 Fog/Haze 9 Thunder Storms  
 WIND DIRECTION CODE: S  
 1 N 5 S  
 2 NE 6 SW  
 3 E 7 W  
 4 SE 8 NW  
 Wind Velocity 5  
 TIDE CODE: 1  
 1 Ebb 3 Flood  
 2 Slack After Ebb 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: —  
 With (W) or Without (WO) oyster liquor —



**CHAIN OF CUSTODY**

| Transferred From:      | To:                | Date:         | Time:                    |
|------------------------|--------------------|---------------|--------------------------|
| <u>Barbara Santana</u> | <u>Ryan Snoder</u> | <u>7/7/20</u> | <u>2<sup>00</sup> pm</u> |
|                        |                    |               |                          |
|                        |                    |               |                          |

Maryland Department of the Environment  
PFAS Pilot Study  
2020

### Field Data Collection Sheet

Date: 7/7/20  
Time: 9:43 am

**SAMPLING TEAM**  
Santana  
Klein

**LOCATION**  
Water Body: St Marys River  
Bottle #: T3-W4  
GPS Coordinates: Latitude: 38° 08' 19" N  
Longitude: 76° 27' 32" W

**DATA PARAMETERS**  
Air Temp: \_\_\_\_\_ °C / F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1 / \_\_\_\_\_  
Water Temp (°C): \_\_\_\_\_ / \_\_\_\_\_  
Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
pH: \_\_\_\_\_ / \_\_\_\_\_  
Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**  
WEATHER CODE: 1  
0 Clear  
1 Partly Cloudy  
2 Continuous Clouds  
3 Blowing Snow/Sand  
4 Fog/Haze  
5 Drizzle  
6 Rain  
7 Snow or Snow w/ Rain  
8 Showers  
9 Thunder Storms  
WIND DIRECTION CODE: S  
1 N  
2 NE  
3 E  
4 SE  
5 S  
6 SW  
7 W  
8 NW  
Wind Velocity S  
TIDE CODE: 1  
1 Ebb  
2 Slack After Ebb  
3 Flood  
4 Slack After Flood  
Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle) YES NO  
Media Sampled (circle one): Oysters Water  
Number of oysters collected: \_\_\_\_\_  
With (W) or Without (WO) oyster liquor: \_\_\_\_\_



| CHAIN OF CUSTODY       |                    |               |                |
|------------------------|--------------------|---------------|----------------|
| Transferred From:      | To:                | Date:         | Time:          |
| <u>Barbara Santana</u> | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>2:00 pm</u> |
|                        |                    |               |                |
|                        |                    |               |                |

Maryland Department of the Environment  
 PFAS Pilot Study  
 2020

Field Data Collection Sheet

Date: 7/7/20  
 Time: 9:57

**SAMPLING TEAM**  
Santina  
Klein

**LOCATION**  
 Water Body St Marys River  
 Bottle #: T3 W4 R  
 GPS Coordinates: Latitude: 38° 08' 11" N  
 Longitude: 76° 27' 32" W

**DATA PARAMETERS**  
 Air Temp: \_\_\_\_\_ °C / °F  
 Water Quality:  
Surface/Bottom  
 Depth (ft.): 1 / 1  
 Water Temp (°C): \_\_\_\_\_ / \_\_\_\_\_  
 Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
 D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
 pH: \_\_\_\_\_ / \_\_\_\_\_  
 Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONOITIONS**  
 WEATHER CODE: 1  
 0 Clear 5 Drizzle  
 1 Partly Cloudy 6 Rain  
 2 Continuous Clouds 7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand 8 Showers  
 4 Fog/Haze 9 Thunder Storms  
 WIND DIRECTION CODE: S  
 1 N 5 S  
 2 NE 6 SW  
 3 E 7 W  
 4 SE 8 NW  
 Wind Velocity 5  
 TIDE CODE: 1  
 1 Ebb 3 Flood  
 2 Slack After Ebb 4 Slack After Flood  
 Rain within the last 48 hours? (circle) **YES** NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) **YES** NO  
 Media Sampled (circle one): Oysters **Water**  
 Number of oysters collected: -  
 With (W) or Without (WO) oyster liquor -



| CHAIN OF CUSTODY       |                     |               |                          |
|------------------------|---------------------|---------------|--------------------------|
| Transferred From:      | To:                 | Date:         | Time:                    |
| <u>Barbara Santina</u> | <u>Ryan Sneider</u> | <u>7/7/20</u> | <u>2<sup>00</sup> pm</u> |
|                        |                     |               |                          |
|                        |                     |               |                          |



Maryland Department of the Environment  
 PFAS Pilot Study  
 2020

Field Data Collection Sheet

Date: 7/7/20  
 Time: 1002 am

**LOCATION**  
 Water Body: St Marys River  
 Bottle #: T3-W3  
 GPS Coordinates: Latitude: 38° 08' 40" N  
 Longitude: 76° 26' 51" W

**SAMPLING TEAM**  
Santana  
Klein

**DATA PARAMETERS**  
 Air Temp \_\_\_\_\_ °C / °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 /  
 Water Temp (°C): /  
 Cond (µS/cm): /  
 D.O (mg/L): /  
 pH: /  
 Salinity: /

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
 0 Clear                          5 Drizzle  
 1 Partly Cloudy                6 Rain  
 2 Continuous Clouds        7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand        8 Showers  
 4 Fog/Haze                      9 Thunder Storms  
**WIND DIRECTION CODE:** S  
 1 N                                5 S  
 2 NE                              6 SW  
 3 E                                7 W  
 4 SE                              8 NW  
 Wind Velocity: S  
**TIDE CODE:** 1  
 1 Ebb                              3 Flood  
 2 Slack After Ebb              4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: -  
 With (W) or Without (WO) oyster liquor -



**CHAIN OF CUSTODY**

| Transferred From:      | To:                | Date:         | Time:                    |
|------------------------|--------------------|---------------|--------------------------|
| <u>Barbara Santana</u> | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>2<sup>00</sup> pm</u> |
|                        |                    |               |                          |
|                        |                    |               |                          |

Maryland Department of the Environment  
 PFAS Pilot Study  
 2020

**Field Data Collection Sheet**

Date: 7/7/20  
 Time: 1007

**SAMPLING TEAM**  
Santana  
Klein

**LOCATION**  
 Water Body: St Marys River  
 Bottle #: T3-W2  
 GPS Coordinates: Latitude: 38° 08' 45" N  
 Longitude: 76° 26' 42" W

**DATA PARAMETERS**  
 Air Temp: \_\_\_\_\_ °C / °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / \_\_\_\_\_  
 Water Temp (°C): \_\_\_\_\_ / \_\_\_\_\_  
 Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
 D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
 pH: \_\_\_\_\_ / \_\_\_\_\_  
 Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
 0 Clear                      5 Drizzle  
 1 Partly Cloudy            6 Rain  
 2 Continuous Clouds      7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand      8 Showers  
 4 Fog/Haze                  9 Thunder Storms  
**WIND DIRECTION CODE:** S  
 1 N                              5 S  
 2 NE                            6 SW  
 3 E                              7 W  
 4 SE                            8 NW  
 Wind Velocity: 5  
**TIDE CODE:** 1  
 1 Ebb                            3 Flood  
 2 Slack After Ebb           4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:      | To:                 | Date:         | Time:          |
|------------------------|---------------------|---------------|----------------|
| <u>Barbara Santana</u> | <u>Ryan Snodder</u> | <u>7/7/20</u> | <u>2:00 pm</u> |
|                        |                     |               |                |
|                        |                     |               |                |

Maryland Department of the Environment  
 PEAS Pilot Study  
 2020

Field Data Collection Sheet

Date: 7/7/20  
 Time: 10:13

**SAMPLING TEAM**  
Santina  
Klein

**LOCATION**  
 Water Body: St Marys River  
 Bottle #: T3-W1  
 GPS Coordinates: Latitude: 38° 08' 50" N  
 Longitude: 76° 26' 28" W

**DATA PARAMETERS**  
 Air Temp: \_\_\_\_\_ °C / F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / \_\_\_\_\_  
 Water Temp (°C): \_\_\_\_\_ / \_\_\_\_\_  
 Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
 D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
 pH: \_\_\_\_\_ / \_\_\_\_\_  
 Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
 WIND DIRECTION CODE: S  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 5  
 TIDE CODE: 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor: \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:      | To:                | Date:         | Time:          |
|------------------------|--------------------|---------------|----------------|
| <u>Barbara Santina</u> | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>2:00 pm</u> |
|                        |                    |               |                |
|                        |                    |               |                |

Maryland Department of the Environment  
 PFAS Pilot Study  
 5/1/21

## Field Data Collection Sheet

Date: 7/7/20  
 Time: 1019

**SAMPLING TEAM**

Sankha  
Klein

**LOCATION**Water Body: St Marys RiverBottle #: FB-8AGPS Coordinates: Latitude: 38° 08' 33" NLongitude: 76° 26' 33" W**DATA PARAMETERS**

Air Temp: \_\_\_\_\_ C / F  
 Water Quality:  
     **Surface/Bottom**  
 Depth (ft): \_\_\_\_\_ / \_\_\_\_\_  
 Water Temp (°C): \_\_\_\_\_ / \_\_\_\_\_  
 Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
 D.O. (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
 pH: \_\_\_\_\_ / \_\_\_\_\_  
 Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**WEATHER CODE:

|                     |                        |
|---------------------|------------------------|
| 0 Clear             | 5 Drizzle              |
| 1 Partly Cloudy     | 6 Rain                 |
| 2 Continuous Clouds | 7 Snow or Snow w/ Rain |
| 3 Blowing Snow/Sand | 8 Showers              |
| 4 Fog/Haze          | 9 Thunder Storms       |

WIND DIRECTION CODE:

|      |      |
|------|------|
| 1 N  | 5 S  |
| 2 NE | 6 SW |
| 3 E  | 7 W  |
| 4 SE | 8 NW |

Wind Velocity TIDE CODE:

|                   |                     |
|-------------------|---------------------|
| 1 Ebb             | 3 Flood             |
| 2 Slack After Ebb | 4 Slack After Flood |

Rain within the last 48 hours? (circle) YES NO

**PUT BOTTLES IN COOLER AND ICED**Samples Iced? (circle) YES NOMedia Sampled (circle one): Oysters Water

Number of oysters collected: \_\_\_\_\_

With (W) or Without (WO) oyster liquor \_\_\_\_\_



Maryland

**CHAIN OF CUSTODY**

| Transferred From:     | To:                | Date:         | Time:          |
|-----------------------|--------------------|---------------|----------------|
| <u>Barbara Sankha</u> | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>2:00 pm</u> |
|                       |                    |               |                |
|                       |                    |               |                |

Maryland Department of the Environment  
 PFAS Pilot Study  
 3/20

Field Data Collection Sheet

Date: 7/7/20  
 Time: 1019

**SAMPLING TEAM**  
Santana  
Klein

**LOCATION**  
 Water Body: St Marys River  
 Bottle #: WFDS-W4  
 GPS Coordinates: Latitude: 38° 08' 33" N  
 Longitude: 76° 26' 33" W

**DATA PARAMETERS**  
 Air Temp: \_\_\_\_\_ C / F  
 Water Quality: \_\_\_\_\_  
**Surface/Bottom**  
 Depth (ft): 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): 1  
 D.O. (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
**WIND DIRECTION CODE:** S  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity S  
**TIDE CODE:** 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor: \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:      | To:                | Date:         | Time:          |
|------------------------|--------------------|---------------|----------------|
| <u>Barbara Santana</u> | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>2:00 pm</u> |
|                        |                    |               |                |
|                        |                    |               |                |

Maryland Department of the Environment  
PFAS Pilot Study  
2020

Field Data Collection Sheet

Date: 7/7/20  
Time: 1025 am

**SAMPLING TEAM**  
Santana  
Klein

**LOCATION**  
Water Body: St Marys River  
Bottle #: WFDS - W3  
GPS Coordinates: Latitude: 38°08'34"N  
Longitude: 76°26'15"W

**DATA PARAMETERS**  
Air Temp \_\_\_\_\_ °C/F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1 /  
Water Temp (°C): 1 /  
Cond. (µS/cm): 1 /  
D.O (mg/L): 1 /  
pH: 1 /  
Salinity: 1 /

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
0 Clear                                 5 Drizzle  
1 Partly Cloudy                       6 Rain  
2 Continuous Clouds                 7 Snow or Snow w/ Rain  
3 Blowing Snow/Sand                 8 Showers  
4 Fog/Haze                             9 Thunder Storms  
**WIND DIRECTION CODE:** S  
1 N                                       5 S  
2 NE                                     6 SW  
3 E                                       7 W     Wind Velocity: S  
4 SE                                     8 NW  
**TIDE CODE:** 1  
1 Ebb                                     3 Flood  
2 Slack After Ebb                     4 Slack After Flood  
  
Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle) YES NO  
Media Sampled (circle one): Oysters Water  
Number of oysters collected: \_\_\_\_\_  
With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:      | To:                | Date:         | Time:                    |
|------------------------|--------------------|---------------|--------------------------|
| <u>Barbara Santana</u> | <u>Ryan Snader</u> | <u>7/7/20</u> | <u>2<sup>00</sup> pm</u> |
|                        |                    |               |                          |
|                        |                    |               |                          |
|                        |                    |               |                          |

Field Data Collection Sheet

Date: 7/7/20  
 Time: 0900  
end 0918

**SAMPLING TEAM**  
McKay / Finer

**LOCATION**  
 Water Body: St. Inigoes  
 Bottle #: EB SA  
 GPS Coordinates: Latitude: \_\_\_\_\_  
 Longitude: \_\_\_\_\_

**DATA PARAMETERS**  
 Air Temp: 31 °C / °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / \_\_\_\_\_  
 Water Temp (°C): \_\_\_\_\_ / \_\_\_\_\_  
 Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
 D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
 pH: \_\_\_\_\_ / \_\_\_\_\_  
 Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:**  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Mist  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
**WIND DIRECTION CODE:**  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: \_\_\_\_\_  
**TIDE CODE:**  
 1 Ebb  
 2 Slack  
 3 Flood  
 4 Slack After Flood  
 Rain with \_\_\_\_\_ hours? (circle) YES NO  
**PUT BOTTLER AND ICED**  
 Samples \_\_\_\_\_ YES NO  
 Media Samples (\_\_\_\_\_): Oysters Water  
 Number of \_\_\_\_\_ collected: \_\_\_\_\_  
 With (W) \_\_\_\_\_ Without (D) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:   | To:                 | Date:         | Time:           |
|---------------------|---------------------|---------------|-----------------|
| <u>Steve Hiner</u>  | <u>Barb Santana</u> | <u>7/7/20</u> | <u>11:03 Am</u> |
| <u>Barb Santana</u> | <u>Bryan Snader</u> | <u>7/7/20</u> | <u>2:00 pm</u>  |
|                     |                     |               |                 |

Maryland Department of the Environment  
 PFAS Pilot Study  
 2020

Field Data Collection Sheet

Date: 7/7/2020  
 Time: 0900AM

**SAMPLING TEAM**  
McKay / Hiver

**LOCATION**  
 Water Body: ST. INIGAES  
 Bottle #: TS-W3  
 GPS Coordinates: Latitude: 38°09'59.2"  
 Longitude: 76°25'19.1"

**DATA PARAMETERS**  
 Air Temp: 31 °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): 1  
 D.O (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
 WIND DIRECTION CODE: 5  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 05  
 TIDE CODE: 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor: \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:   | To:                 | Date:           | Time:           |
|---------------------|---------------------|-----------------|-----------------|
| <u>Steve Hiver</u>  | <u>Barb Santana</u> | <u>7/7/2020</u> | <u>11:03 AM</u> |
| <u>Barb Santana</u> | <u>Ryan Snader</u>  | <u>7/7/20</u>   | <u>2:00 PM</u>  |
|                     |                     |                 |                 |



Maryland Department of the Environment  
PFAS Pilot Study  
2020

### Field Data Collection Sheet

Date: 7/7/20  
 Time: 0910

**SAMPLING TEAM**  
Melny / Hiner

**LOCATION**  
 Water Body: St. Inigoes  
 Bottle #: TS-W2  
 GPS Coordinates: Latitude: 38.0955.0  
 Longitude: 76.2516.1

**DATA PARAMETERS**  
 Air Temp: 31 °F  
 Water Quality:  
Surface/Bottom  
 Depth (ft.): 1 / 12'  
 Water Temp (°C): 29.2 / 29.9  
 Cond. (µS/cm): 18230 / 19060  
 D.O (mg/L): 6.7 / 6.8  
 pH: 8.2 / 7.9  
 Salinity: 10.7 / 11.2

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 4  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
 WIND DIRECTION CODE: 5  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 05  
 TIDE CODE: 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:      | To:                    | Date:           | Time:                    |
|------------------------|------------------------|-----------------|--------------------------|
| <u>Steve Hiner</u>     | <u>Barbara Santana</u> | <u>7/7/2020</u> | <u>11:03AM</u>           |
| <u>Barbara Santana</u> | <u>Ryan Snader</u>     | <u>7/7/2020</u> | <u>2<sup>00</sup> PM</u> |
|                        |                        |                 |                          |
|                        |                        |                 |                          |

Field Data Collection Sheet

Date: 7/7/20  
 Time: 7:20 AM 09:15 AM

**SAMPLING TEAM**  
McKay / Emer

**LOCATION**  
 Water Body: SEAPOES  
 Bottle #: T5-W1  
 GPS Coordinates: Latitude: 38 09 51.3  
 Longitude: 76 25 16.4

**DATA PARAMETERS**  
 Air Temp: 31 °C / °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): 1  
 D.O (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
**WIND DIRECTION CODE:** 5  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 05  
**TIDE CODE:** 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor: \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:   | To:                 | Date:           | Time:           |
|---------------------|---------------------|-----------------|-----------------|
| <u>Steve Hiner</u>  | <u>Barb Sanlana</u> | <u>7/7/2020</u> | <u>11:03 AM</u> |
| <u>Barb Sanlana</u> | <u>Ryan Snader</u>  | <u>7/7/20</u>   | <u>2:00 PM</u>  |
|                     |                     |                 |                 |

Maryland Department of the Environment  
 PI-AS Pilot Study  
 2020

Field Data Collection Sheet

Date: 07/07/20  
 Time: 0931 start  
0949 end

**SAMPLING TEAM**  
McKoy/Hine

**LOCATION**  
 Water Body St. Marys/St. Inigoes  
 Bottle #: FB-2A  
 GPS Coordinates: Latitude: 38 09 33.2  
 Longitude: 76 26 05.9  
38 09 19.1 / 76 26 06.2

**DATA PARAMETERS**  
 Air Temp: \_\_\_\_\_ °C / °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / \_\_\_\_\_  
 Water Temp (°C): \_\_\_\_\_ / \_\_\_\_\_  
 Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
 D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
 pH: \_\_\_\_\_ / \_\_\_\_\_  
 Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
 WIND DIRECTION CODE: 5  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 05  
 TIDE CODE: \_\_\_\_\_  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:      | To:                 | Date:         | Time:           |
|------------------------|---------------------|---------------|-----------------|
| <u>Steve Hines</u>     | <u>Barb Santana</u> | <u>7/7/20</u> | <u>11:03 AM</u> |
| <u>Barbara Santana</u> | <u>Ryan Snader</u>  | <u>7/7/20</u> | <u>2:00 PM</u>  |
|                        |                     |               |                 |

Maryland Department of the Environment  
 PFAS Pilot Study  
 2020

Field Data Collection Sheet

Date: 07/07/2020  
 Time: 9:31 AM

**SAMPLING TEAM**  
McKay / Hiner

**LOCATION**  
 Water Body: ST. Marys / ST. Ignace  
 Bottle #: TAMMAS T2-W3  
 GPS Coordinates: Latitude: 38.0933.1  
 Longitude: 76.26053

**DATA PARAMETERS**  
 Air Temp: 33 °C / °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 2 / 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): 1  
 D.O (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
 WIND DIRECTION CODE: 5  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 05  
 TIDE CODE: 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:      | To:                 | Date:           | Time:           |
|------------------------|---------------------|-----------------|-----------------|
| <u>Stacy Hiner</u>     | <u>Barb Santana</u> | <u>7/7/2020</u> | <u>11:03 AM</u> |
| <u>Barbara Santana</u> | <u>Ryan Snodder</u> | <u>7/7/20</u>   | <u>2:00 PM</u>  |
|                        |                     |                 |                 |
|                        |                     |                 |                 |

Maryland Department of the Environment  
 PFAS Pilot Study  
 2020

Field Data Collection Sheet

Date: 7/7/2020  
 Time: 09:35 AM

**SAMPLING TEAM**  
Mickey Hiner

**LOCATION**  
 Water Body: ST MARYS / ST INIGOES  
 Bottle #: T2-W2  
 GPS Coordinates: Latitude: 3809270  
 Longitude: 7626062

**DATA PARAMETERS**  
 Air Temp: 34 °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): 1  
 D.O (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
 WIND DIRECTION CODE: 5  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity 05  
 TIDE CODE: 4  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle)  YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle)  YES NO  
 Media Sampled (circle one): Oysters  Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:     | To:                   | Date:           | Time:                    |
|-----------------------|-----------------------|-----------------|--------------------------|
| <u>Steve Hiner</u>    | <u>BARB SANDRA</u>    | <u>7/7/2020</u> | <u>11:03 AM</u>          |
| <u>Barbara Sandra</u> | <u>Ryan Snodgrass</u> | <u>7/7/20</u>   | <u>2<sup>nd</sup> PM</u> |
|                       |                       |                 |                          |

Maryland Department of the Environment  
 PFAS Pilot Study  
 2020

Field Data Collection Sheet

Date: 7/7/20  
 Time: 9:44 AM

**SAMPLING TEAM**  
MCKay / Hiner

**LOCATION**  
 Water Body: St. Marys / St. Inigoes  
 Bottle #: 12-W1  
 GPS Coordinates: Latitude: 38° 09' 19.1  
 Longitude: 76° 26' 06.1

**DATA PARAMETERS**  
 Air Temp: 34 °F  
 Water Quality: Surface/Bottom  
 Depth (ft.): 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): 1  
 D.O (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear 5 Drizzle  
 1 Partly Cloudy 6 Rain  
 2 Continuous Clouds 7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand 8 Showers  
 4 Fog/Haze 9 Thunder Storms  
 WIND DIRECTION CODE: 5  
 1 N 5 S  
 2 NE 6 SW  
 3 E 7 W  
 4 SE 8 NW  
 Wind Velocity: 05  
 TIDE CODE: 1  
 1 Ebb 3 Flood  
 2 Slack After Ebb 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:   | To:                 | Date:           | Time:           |
|---------------------|---------------------|-----------------|-----------------|
| <u>Steve Hiner</u>  | <u>Barb Santora</u> | <u>7/7/2020</u> | <u>11:03 AM</u> |
| <u>Barb Santora</u> | <u>Bryan Sactor</u> | <u>7/7/20</u>   | <u>2:00 PM</u>  |
|                     |                     |                 |                 |

Maryland Department of the Environment  
 PFAS Pilot Study  
 2020

Field Data Collection Sheet

Date: 7/7/20  
 Time: 0952 start  
end 0959

**SAMPLING TEAM**  
McKeney / Hiner

**LOCATION**  
 Water Body: St. Marys R.  
 Bottle #: FB-88  
 GPS Coordinates: Latitude: 38 09 20.  
 Longitude: 76 26 22  
WFDS-W2 + WFDS W1

**DATA PARAMETERS**  
 Air Temp: \_\_\_\_\_ °C / °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 /  
 Water Temp (°C): /  
 Cond. (µS/cm): /  
 D.O (mg/L): /  
 pH: /  
 Salinity: /

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:**  
 0 Clear 5 Drizzle  
 1 Partly Cloudy 6 Rain  
 2 Continuous Clouds 7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand 8 Showers  
 4 Fog/Haze 9 Thunder Storms  
**WIND DIRECTION CODE:**  
 1 N 5 S  
 2 NE 6 SW  
 3 E 7 W  
 4 SE 8 NW  
 Wind Velocity:    
**TIDE CODE:**  
 1 Ebb 3 Flood  
 2 Slack After Ebb 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:      | To:                    | Date:         | Time:           |
|------------------------|------------------------|---------------|-----------------|
| <u>Steve Hiner</u>     | <u>Barbara Sandona</u> | <u>7/7/20</u> | <u>11:00 am</u> |
| <u>Barbara Sandona</u> | <u>Ryan Snelter</u>    | <u>7/7/20</u> | <u>2:00 pm</u>  |
|                        |                        |               |                 |

Maryland Department of the Environment  
 PEAS Pilot Study  
 2020

Field Data Collection Sheet

Date: 7/7/2020  
 Time: 09:59 AM

**SAMPLING TEAM**  
McKay Hiner

**LOCATION**  
 Water Body: ST. MARK  
 Bottle #: WTDS-W1  
 GPS Coordinates: Latitude: 38.0914.0  
 Longitude: 76.2617.2

**DATA PARAMETERS**  
 Air Temp: 34.0  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): 1  
 D.O (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
**WIND DIRECTION CODE:** 5  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 05  
**TIDE CODE:** 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:   | To:                 | Date:           | Time:           |
|---------------------|---------------------|-----------------|-----------------|
| <u>Steve Hiner</u>  | <u>Barb Sanlana</u> | <u>7/7/2020</u> | <u>11:03 AM</u> |
| <u>Barb Sanlana</u> | <u>Ryan Snader</u>  | <u>7/7/20</u>   | <u>2:00 PM</u>  |
|                     |                     |                 |                 |



Maryland Department of the Environment  
 PFAS Pilot Study  
 2020

Field Data Collection Sheet

Date: 7/7/2020  
 Time: 09:52 AM

**SAMPLING TEAM**  
McKay Himer

**LOCATION**  
 Water Body: ST. MARYS  
 Bottle #: WFD-12  
 GPS Coordinates: Latitude: 38° 09' 20.0  
 Longitude: 76° 26' 22.0

**DATA PARAMETERS**  
 Air Temp: 34 °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): 1  
 D.O (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Cloud  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 Showers  
 Thunder Storms  
 WIND DIRECTION CODE: 5  
 1 N  
 2 NE  
 3 E  
 4 SE  
 Wind Velocity: 05  
 TIDE CODE: 1  
 1 Ebb  
 2 Slack After  
 Flood  
 Slack After Flood  
 Rain within the last 24 hours? (circle) YES NO  
**PUT BOTTLES IN COOLERS AND ICED**  
 Samples Iced? (circle) NO  
 Media Sampled (circle) Water  
 Number of oyster shells: \_\_\_\_\_  
 With (W) or Without (WO) shell liquor: \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:    | To:                  | Date:           | Time:                    |
|----------------------|----------------------|-----------------|--------------------------|
| <u>Steve Himer</u>   | <u>Barry Santana</u> | <u>7/7/2020</u> | <u>11:03 AM</u>          |
| <u>Barry Santana</u> | <u>Ryan Swader</u>   | <u>7/7/20</u>   | <u>2<sup>00</sup> PM</u> |
|                      |                      |                 |                          |

Maryland Department of the Environment  
PFAS Pilot Study  
2020

### Field Data Collection Sheet

Date: 7/7/20  
 Time: 600 am

**SAMPLING TEAM**  
Mckay  
Hiner

**LOCATION**  
 Water Body: \_\_\_\_\_  
 Bottle #: TB-001  
 GPS Coordinates: Latitude: \_\_\_\_\_  
 Longitude: \_\_\_\_\_

**DATA PARAMETERS**  
 Air Temp: \_\_\_\_\_ C / F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / \_\_\_\_\_  
 Water Temp (C): \_\_\_\_\_ / \_\_\_\_\_  
 Cond (uS/cm): \_\_\_\_\_ / \_\_\_\_\_  
 D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
 pH: \_\_\_\_\_ / \_\_\_\_\_  
 Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:**  
 0 Clear                                    5 Drizzle  
 1 Partly Cloudy                        6 Rain  
 2 Continuous Clouds                7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand                8 Showers  
 4 Fog/Haze                                9 Thunder Storms  
**WIND DIRECTION CODE:**  
 1 N    5 S  
 2 NE                                        6 SW  
 3 E    7 W  
 4 SE                                        8 NW  
 Wind Velocity: \_\_\_\_\_  
**TIDE CODE:**  
 1 Ebb                                        3 Flood  
 2 Slack After Ebb                      4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



| CHAIN OF CUSTODY   |                    |               |                |
|--------------------|--------------------|---------------|----------------|
| Transferred From:  | To:                | Date:         | Time:          |
| <u>Steve Hiner</u> | <u>Barb Sanbra</u> | <u>7/7/20</u> | <u>1103 am</u> |
|                    |                    |               |                |
|                    |                    |               |                |

Maryland Department of the Environment  
PFAS Pilot Study  
2020

### Field Data Collection Sheet-Oyster Collections

Date: 8/10/2020  
 Time: 06:00 AM

**SAMPLING TEAM**  
Debra / Hines

**LOCATION**

Water Body: \_\_\_\_\_  
 Bottle #: TB-100  
 GPS Coordinates: Latitude: \_\_\_\_\_  
 Longitude: \_\_\_\_\_

**DATA PARAMETERS**

Air Temp: \_\_\_\_\_ °C / °F

Water Quality:  
**Surface/Bottom**

Depth (ft.): 1 / \_\_\_\_\_  
 Water Temp (°C): \_\_\_\_\_ / \_\_\_\_\_  
 Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
 D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
 pH: \_\_\_\_\_ / \_\_\_\_\_  
 Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**

**WEATHER CODE:**

|                     |                        |
|---------------------|------------------------|
| 0 Clear             | 5 Drizzle              |
| 1 Partly Cloudy     | 6 Rain                 |
| 2 Continuous Clouds | 7 Snow or Snow w/ Rain |
| 3 Blowing Snow/Sand | 8 Showers              |
| 4 Fog/Haze          | 9 Thunder Storms       |

**WIND DIRECTION CODE:**

|      |      |
|------|------|
| 1 N  | 5 S  |
| 2 NE | 6 SW |
| 3 E  | 7 W  |
| 4 SE | 8 NW |

Wind Velocity:  

**TIDE CODE:**

|                   |                     |
|-------------------|---------------------|
| 1 Ebb             | 3 Flood             |
| 2 Slack After Ebb | 4 Slack After Flood |

Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor: \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:          | Time:        |
|--------------------|--------------------|----------------|--------------|
| <u>Steve Hines</u> | <u>Ryan Snader</u> | <u>8/10/20</u> | <u>11:00</u> |
|                    |                    |                |              |
|                    |                    |                |              |

Maryland Department of the Environment  
PFAS Pilot Study  
2020

### Field Data Collection Sheet-Oyster Collections

Date: 8/10/20  
 Time: 0845

**SAMPLING TEAM**  
McKay/Hiner

**LOCATION**  
 Water Body: St. In. coves.  
 Bottle #: T5-01-FB  
 GPS Coordinates: Latitude: 38 09 50.2  
 Longitude: 076 25 16.8

**DATA PARAMETERS**  
 Air Temp: 31 °C / °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): /  
 D.O (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
**WIND DIRECTION CODE:** 06  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 05  
**TIDE CODE:** 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:            | Time:        |
|--------------------|--------------------|------------------|--------------|
| <u>Steve Hiner</u> | <u>Ryan Snader</u> | <u>8/10/2020</u> | <u>11:00</u> |
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Field Data Collection Sheet-Oyster Collections

Date: 8/10/2020  
 Time: 9:05

**SAMPLING TEAM**  
McKay Hiner

**LOCATION**  
 Water Body: ST. INIGOS  
 Bottle #: TS-016  
 GPS Coordinates: Latitude: 38°29'50.2  
 Longitude: 076°25'15.8

**DATA PARAMETERS**  
 Air Temp: 31 °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 13  
 Water Temp (°C): 29.5 / 28.9  
 Cond. (µS/cm): 18450 / 21400  
 D.O (mg/L): 7.8 / 5.6  
 pH: 7.9 / 7.7  
 Salinity: 10.8 / 12.8

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
 WIND DIRECTION CODE: 6  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 05  
 TIDE CODE: 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: 12  
 With (W) or Without (WO) oyster liquor W



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:            | Time:        |
|--------------------|--------------------|------------------|--------------|
| <u>Steve Hiner</u> | <u>Ryan Snader</u> | <u>8/10/2020</u> | <u>11:00</u> |
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Maryland Department of the Environment  
PFAS Pilot Study  
2020

### Field Data Collection Sheet-Oyster Collections

Date: 8/10/20  
Time: 08:05

**SAMPLING TEAM**  
McKay / Hiner

**LOCATION**  
Water Body: St. James  
Bottle #: T-5-01  
GPS Coordinates: Latitude: 39 09 50.2  
Longitude: 76 25 13.8

**DATA PARAMETERS**  
Air Temp: 31 °F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1 / 13  
Water Temp (°C): 24.5 / 28.9  
Cond. (µS/cm): 18450 / 21400  
D.O (mg/L): 7.8 / 5.6  
pH: 7.9 / 7.7  
Salinity: 10.8 / 12.8

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
0 Clear  
 1 Partly Cloudy  
2 Continuous Clouds  
3 Blowing Snow/Sand  
4 Fog/Haze  
5 Drizzle  
6 Rain  
7 Snow or Snow w/ Rain  
8 Showers  
9 Thunder Storms  
**WIND DIRECTION CODE:** 6  
1 N  
2 NE  
3 E  
4 SE  
5 S  
 6 SW  
7 W  
8 NW  
Wind Velocity: 05  
**TIDE CODE:** 1  
 1 Ebb  
2 Slack After Ebb  
3 Flood  
4 Slack After Flood  
Rain within the last 48 hours? (circle) YES  NO   
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle) YES  NO   
Media Sampled (circle one):  Oysters  Water  
Number of oysters collected: 12  
With (W) or Without (WO) oyster liquor: WO



| CHAIN OF CUSTODY   |                    |                |              |
|--------------------|--------------------|----------------|--------------|
| Transferred From:  | To:                | Date:          | Time:        |
| <u>Steel Hiner</u> | <u>Ryan Snader</u> | <u>8/10/20</u> | <u>11:00</u> |
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Maryland Department of the Environment  
 PFAS Pilot Study  
 2020

Field Data Collection Sheet-Oyster Collections

Date: 8/10/20  
 Time: 0923

**SAMPLING TEAM**  
McKay/Hiner

**LOCATION**  
 Water Body: ST. INIGONES  
 Bottle #: T-2 O1 FB  
 GPS Coordinates: Latitude: 38 09 22  
 Longitude: 076 26 06 S

**DATA PARAMETERS**  
 Air Temp: 34 °C/F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): 1  
 D.O (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
 WIND DIRECTION CODE: 6  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 05  
 TIDE CODE: 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor: \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:          | Time:        |
|--------------------|--------------------|----------------|--------------|
| <u>Steve Hiner</u> | <u>Ryan Snoder</u> | <u>8/10/20</u> | <u>11:00</u> |
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Maryland Department of the Environment  
 PFAS Pilot Study  
 2020

Field Data Collection Sheet-Oyster Collections

Date: 8/10/2020  
 Time: 9:30 AM

**SAMPLING TEAM**  
Hirer McKay

**LOCATION**  
 Water Body: St. Inigoes  
 Bottle #: T2-01  
 GPS Coordinates: Latitude: 38.0922.2  
 Longitude: 076.2686.8

**DATA PARAMETERS**  
 Air Temp: 34 °C / °F  
 Water Quality:  
**Surface / Bottom**  
 Depth (ft.): 1 / 1  
 Water Temp (°C): 1  
 Cond. (µS/cm): 1  
 D.O (mg/L): 1  
 pH: 1  
 Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
**WIND DIRECTION CODE:** 6  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity 05  
**TIDE CODE:** 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: T2-01  
 With (W) or Without (WO) oyster liquor: WO



| CHAIN OF CUSTODY   |                    |                  |              |
|--------------------|--------------------|------------------|--------------|
| Transferred From:  | To:                | Date:            | Time:        |
| <u>Steve Hirer</u> | <u>Ryan Snader</u> | <u>8/10/2020</u> | <u>11:00</u> |
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Field Data Collection Sheet-Oyster Collections

Date: 8/10/2020  
Time: 09:30 AM

**SAMPLING TEAM**  
McKay / Hiner

**LOCATION**  
Water Body: ST. INIGOEES  
Bottle #: T2-01 L  
GPS Coordinates: Latitude: 38 09 22.2  
Longitude: 076 26 06.8

**DATA PARAMETERS**  
Air Temp: 34 °C / °F  
Water Quality:  
**Surface/Bottom**  
Depth (ft.): 1 / 1  
Water Temp (°C): 1  
Cond. (µS/cm): 1 / 1  
D.O (mg/L): 1  
pH: 1  
Salinity: 1

**ENVIRONMENTAL CONDITIONS**  
WEATHER CODE: 1  
0 Clear  
1 Partly Cloudy  
2 Continuous Clouds  
3 Blowing Snow/Sand  
4 Fog/Haze  
5 Drizzle  
6 Rain  
7 Snow or Snow w/ Rain  
8 Showers  
9 Thunder Storms  
WIND DIRECTION CODE: 6  
1 N  
2 NE  
3 E  
4 SE  
5 S  
6 SW  
7 W  
8 NW  
Wind Velocity: 05  
TIDE CODE: 1  
1 Ebb  
2 Slack After Ebb  
3 Flood  
4 Slack After Flood  
Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
Samples Iced? (circle) YES NO  
Media Sampled (circle one): Oysters Water  
Number of oysters collected: 12  
With W or Without (WO) oyster liquor W



**CHAIN OF CUSTODY**

| Transferred From:  | To:                | Date:            | Time:        |
|--------------------|--------------------|------------------|--------------|
| <u>Steve Hiner</u> | <u>Ryan Snoder</u> | <u>8/10/2020</u> | <u>11:00</u> |
|                    |                    |                  |              |
|                    |                    |                  |              |

### Field Data Collection Sheet-Oyster Collections

Date: 8/11/20  
 Time: 9:00

**SAMPLING TEAM**  
Santana  
Klein

**LOCATION**  
 Water Body: \_\_\_\_\_  
 Bottle #: TI-01FB  
 GPS Coordinates: Latitude: \_\_\_\_\_  
 Longitude: \_\_\_\_\_

**DATA PARAMETERS**  
 Air Temp: \_\_\_\_\_ °C / °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / \_\_\_\_\_  
 Water Temp (°C): \_\_\_\_\_ / \_\_\_\_\_  
 Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
 D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
 pH: \_\_\_\_\_ / \_\_\_\_\_  
 Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** \_\_\_\_\_  
 0 Clear                                    5 Drizzle  
 1 Partly Cloudy                        6 Rain  
 2 Continuous Clouds                 7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand                 8 Showers  
 4 Fog/Haze                                9 Thunder Storms  
**WIND DIRECTION CODE:** \_\_\_\_\_  
 1 N                                         5 S  
 2 NE                                        6 SW  
 3 E                                         7 W  
 4 SE                                        8 NW  
 Wind Velocity: \_\_\_\_\_  
**TIDE CODE:** \_\_\_\_\_  
 1 Ebb                                        3 Flood  
 2 Slack After Ebb                       4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



| <b>CHAIN OF CUSTODY</b> |                    |                |             |
|-------------------------|--------------------|----------------|-------------|
| Transferred From:       | To:                | Date:          | Time:       |
| <u>Barbara Santana</u>  | <u>Ryan Snaden</u> | <u>8/11/20</u> | <u>2:00</u> |
|                         |                    |                |             |
|                         |                    |                |             |

Field Data Collection Sheet

Date: 8-11-2020  
 Time: 9:36

**SAMPLING TEAM**  
Nelson  
McManus

**LOCATION**  
 Water Body: Fishing Bay  
 Bottle #: FB-W1  
 GPS Coordinates: Latitude: 38° 15' 34.7"  
 Longitude: 76° 01' 53.1"

**DATA PARAMETERS**  
 Air Temp: 29 °C/°F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 8  
 Water Temp (°C): 29.5 / 29.2  
 Cond. (µS/cm): 23440 / 23540  
 D.O (mg/L): 7.4 / 7.1  
 pH: 7.9 / 7.8  
 Salinity: 14.1 / 14.2

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
**WIND DIRECTION CODE:** 5  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 10  
**TIDE CODE:** 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor: \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From: | To:                 | Date:          | Time:        |
|-------------------|---------------------|----------------|--------------|
| <u>An McManus</u> | <u>Danny J. ...</u> | <u>8-11-20</u> | <u>10:17</u> |
| <u>...</u>        |                     |                |              |
|                   |                     |                |              |

**Field Data Collection Sheet**

Date: 8-11-2020  
 Time: 9:36 am

**SAMPLING TEAM**  
Nelson  
McMAHUS

**LOCATION**  
 Water Body: FISHING BAY  
 Bottle #: FB-01  
 GPS Coordinates: Latitude: 38° 15' 34.7"  
 Longitude: 76° 01' 53.1"

**DATA PARAMETERS**  
 Air Temp: 29 °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 8  
 Water Temp (°C): 29.5 / 29.2  
 Cond. (µS/cm): 23440 / 23540  
 D.O (mg/L): 0.74 / 0.71  
 pH: 07.9 / 07.9  
 Salinity: 14.1 / 14.2

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
 WIND DIRECTION CODE: 5  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 10  
 TIDE CODE: 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: 12  
 With (W) or Without (WO) oyster liquor WO



**CHAIN OF CUSTODY**

| Transferred From: | To:           | Date:          | Time:        |
|-------------------|---------------|----------------|--------------|
| <u>Andrews</u>    | <u>Darryl</u> | <u>8-11-20</u> | <u>10:36</u> |
| <u>Darryl</u>     |               |                |              |
|                   |               |                |              |

Field Data Collection Sheet

Date: 8-11-2020  
 Time: 9:36 am

**SAMPLING TEAM**  
Nelson  
McManis

**LOCATION**  
 Water Body: FISHING BAY  
 Bottle #: FB-01L  
 GPS Coordinates: Latitude: 38° 15' 34.7"  
 Longitude: 76° 01' 53.1"

**DATA PARAMETERS**  
 Air Temp: 29 °C/°F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 2 / 8  
 Water Temp (°C): 29.5 / 29.2  
 Cond. (µS/cm): 23440 / 23540  
 D.O (mg/L): 7.4 / 7.1  
 pH: 7.9 / 7.8  
 Salinity: 14.1 / 14.2

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
**WIND DIRECTION CODE:** 5  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 10  
**TIDE CODE:** 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: 12  
 With (W) or Without (WO) oyster liquor W



**CHAIN OF CUSTODY**

| Transferred From:              | To:                  | Date:          | Time:        |
|--------------------------------|----------------------|----------------|--------------|
| <u>Anne Marie S. VanHousen</u> | <u>Pamela J. ...</u> | <u>8-11-20</u> | <u>10:36</u> |
|                                |                      |                |              |
|                                |                      |                |              |

Field Data Collection Sheet

Date: 8-11-2020  
 Time: 6:30 AM

**SAMPLING TEAM**  
Nelson  
McManus

**LOCATION**  
 Water Body: Trip Blank  
 Bottle #: TB-201  
 GPS Coordinates: Latitude: \_\_\_\_\_  
 Longitude: \_\_\_\_\_

**DATA PARAMETERS**  
 Air Temp: \_\_\_\_\_ °C / °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 1  
 Water Temp (°C): \_\_\_\_\_ / \_\_\_\_\_  
 Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
 D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
 pH: \_\_\_\_\_ / \_\_\_\_\_  
 Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** \_\_\_\_\_  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
**WIND DIRECTION CODE:** \_\_\_\_\_  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity:    
**TIDE CODE:** \_\_\_\_\_  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



Fishing Bay

**CHAIN OF CUSTODY**

| Transferred From: | To: | Date: | Time: |
|-------------------|-----|-------|-------|
|                   |     |       |       |
|                   |     |       |       |
|                   |     |       |       |

### Field Data Collection Sheet

Date: 8-11-2020  
 Time: 9:36 AM

**SAMPLING TEAM**  
Nelson  
McManus

**LOCATION**  
 Water Body: Field Blank  
 Bottle #: FB-7A  
 GPS Coordinates: Latitude: \_\_\_\_\_  
 Longitude: \_\_\_\_\_

**DATA PARAMETERS**

Air Temp: \_\_\_\_\_ °C / °F

Water Quality:  
**Surface/Bottom**

Depth (ft.): 1 / \_\_\_\_\_

Water Temp (°C): \_\_\_\_\_ / \_\_\_\_\_

Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_

D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_

pH: \_\_\_\_\_ / \_\_\_\_\_

Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**

**WEATHER CODE:** \_\_\_\_\_

|                     |                        |
|---------------------|------------------------|
| 0 Clear             | 5 Drizzle              |
| 1 Partly Cloudy     | 6 Rain                 |
| 2 Continuous Clouds | 7 Snow or Snow w/ Rain |
| 3 Blowing Snow/Sand | 8 Showers              |
| 4 Fog/Haze          | 9 Thunder Storms       |

**WIND DIRECTION CODE:** \_\_\_\_\_

|      |      |
|------|------|
| 1 N  | 5 S  |
| 2 NE | 6 SW |
| 3 E  | 7 W  |
| 4 SE | 8 NW |

Wind Velocity: \_\_\_\_\_

**TIDE CODE:** \_\_\_\_\_

|                   |                     |
|-------------------|---------------------|
| 1 Ebb             | 3 Flood             |
| 2 Slack After Ebb | 4 Slack After Flood |

Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor: \_\_\_\_\_



Fishing Bay

**CHAIN OF CUSTODY**

| Transferred From: | To: | Date: | Time: |
|-------------------|-----|-------|-------|
|                   |     |       |       |
|                   |     |       |       |
|                   |     |       |       |

### Field Data Collection Sheet

Date: 8/11/20  
 Time: 6:00

**SAMPLING TEAM**  
R. Snader  
C. Wose

**LOCATION**  
 Water Body: \_\_\_\_\_  
 Bottle #: TB-200  
 GPS Coordinates: Latitude: \_\_\_\_\_  
 Longitude: \_\_\_\_\_

**DATA PARAMETERS**  
 Air Temp: \_\_\_\_\_ °C / °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 1  
 Water Temp (°C): \_\_\_\_\_ / \_\_\_\_\_  
 Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
 D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
 pH: \_\_\_\_\_ / \_\_\_\_\_  
 Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
 WIND DIRECTION CODE: 4  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 06  
 TIDE CODE: 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From: | To: | Date: | Time: |
|-------------------|-----|-------|-------|
|                   |     |       |       |
|                   |     |       |       |
|                   |     |       |       |



Field Data Collection Sheet

Date: 8/11/20  
 Time: 1000

**SAMPLING TEAM**  
R. Snader  
C. Wose

**DATA PARAMETERS**

Air Temp: 27 °F  
 Water Quality:  
**Surface/Bottom**

Depth (ft.): 1 / 10  
 Water Temp (°C): 28.7 / 28.2  
 Cond. (µS/cm): 22100 / 23850  
 D.O (mg/L): 6.6 / 3.0  
 pH: 7.9 / 7.5  
 Salinity: 13.2 / 14.4

**LOCATION**

Water Body: Pax River  
 Bottle #: HP-01L  
 GPS Coordinates: Latitude: 38° 18' 05.7"  
 Longitude: 76° 22' 25.2"

**ENVIRONMENTAL CONDITIONS**

WEATHER CODE: 1

|                     |                        |
|---------------------|------------------------|
| 0 Clear             | 5 Drizzle              |
| 1 Partly Cloudy     | 6 Rain                 |
| 2 Continuous Clouds | 7 Snow or Snow w/ Rain |
| 3 Blowing Snow/Sand | 8 Showers              |
| 4 Fog/Haze          | 9 Thunder Storms       |

WIND DIRECTION CODE: 4

|      |      |
|------|------|
| 1 N  | 5 S  |
| 2 NE | 6 SW |
| 3 E  | 7 W  |
| 4 SE | 8 NW |

Wind Velocity 06

TIDE CODE: 1

|                   |                     |
|-------------------|---------------------|
| 1 Ebb             | 3 Flood             |
| 2 Slack After Ebb | 4 Slack After Flood |

Rain within the last 48 hours? (circle) YES  NO

PUT BOTTLES IN COOLER AND ICED

Samples Iced? (circle) YES  NO

Media Sampled (circle one): Oysters Water

Number of oysters collected: 12

With  or Without (WO) oyster liquor W



**CHAIN OF CUSTODY**

| Transferred From: | To: | Date: | Time: |
|-------------------|-----|-------|-------|
|                   |     |       |       |
|                   |     |       |       |
|                   |     |       |       |

Field Data Collection Sheet

Date: 8/11/20  
 Time: 1000

**SAMPLING TEAM**  
R. Snader  
C. Wose

**LOCATION**  
 Water Body: Pox. River  
 Bottle #: HP-01  
 GPS Coordinates: Latitude: 38° 18' 05.7"  
 Longitude: 76° 22' 25.2"

**DATA PARAMETERS**  
 Air Temp: 27 °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 10  
 Water Temp (°C): 28.7 / 28.2  
 Cond. (µS/cm): 22100 / 23850  
 D.O (mg/L): 6.6 / 3.0  
 pH: 7.9 / 7.5  
 Salinity: 13.2 / 14.4

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear 5 Drizzle  
 1 Partly Cloudy 6 Rain  
 2 Continuous Clouds 7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand 8 Showers  
 4 Fog/Haze 9 Thunder Storms  
 WIND DIRECTION CODE: 4  
 1 N 5 S  
 2 NE 6 SW  
 3 E 7 W  
 4 SE 8 NW  
 Wind Velocity: 06  
 TIDE CODE: 1  
 1 Ebb 3 Flood  
 2 Slack After Ebb 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: 12  
 With (W) or Without (WO) oyster liquor w/o



**CHAIN OF CUSTODY**

| Transferred From: | To: | Date: | Time: |
|-------------------|-----|-------|-------|
|                   |     |       |       |
|                   |     |       |       |
|                   |     |       |       |

### Field Data Collection Sheet

Date: 8/11/20  
 Time: 1000

**LOCATION**

Water Body: Bay / Hog Pt / Pax  
 Bottle #: FB-9A  
 GPS Coordinates: Latitude: 38° 18' 05.7"  
 Longitude: 76° 22' 25.2"

**SAMPLING TEAM**

C. Wose  
R. Snader

**DATA PARAMETERS**

Air Temp: 27 °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 10  
 Water Temp (°C): 28.7 / 28.2  
 Cond. (µS/cm): 22100 / 23850  
 D.O (mg/L): 6.6 / 3.0  
 pH: 7.9 / 7.5  
 Salinity: 13.2 / 14.4

**ENVIRONMENTAL CONDITIONS**

**WEATHER CODE:** 1

|                     |                        |
|---------------------|------------------------|
| 0 Clear             | 5 Drizzle              |
| 1 Partly Cloudy     | 6 Rain                 |
| 2 Continuous Clouds | 7 Snow or Snow w/ Rain |
| 3 Blowing Snow/Sand | 8 Showers              |
| 4 Fog/Haze          | 9 Thunder Storms       |

**WIND DIRECTION CODE:** 4

|      |      |                          |
|------|------|--------------------------|
| 1 N  | 5 S  | Wind Velocity: <u>06</u> |
| 2 NE | 6 SW |                          |
| 3 E  | 7 W  |                          |
| 4 SE | 8 NW |                          |

**TIDE CODE:** 1

|                   |                     |
|-------------------|---------------------|
| 1 Ebb             | 3 Flood             |
| 2 Slack After Ebb | 4 Slack After Flood |

Rain within the last 48 hours? (circle) YES  NO

**PUT BOTTLES IN COOLER AND ICED**

Samples Iced? (circle) YES  NO

Media Sampled (circle one): Oysters  Water

Number of oysters collected: \_\_\_\_\_

With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From: | To: | Date: | Time: |
|-------------------|-----|-------|-------|
|                   |     |       |       |
|                   |     |       |       |
|                   |     |       |       |

### Field Data Collection Sheet

Date: 8/11/20  
 Time: 1000

**LOCATION**

Water Body: Pax. River  
 Bottle #: HP-W1  
 GPS Coordinates: Latitude: 38° 18' 05.7"  
 Longitude: 76° 22' 25.2"

**SAMPLING TEAM**

C. Wase  
R. Snader

**DATA PARAMETERS**

Air Temp: 27 °F  
 Water Quality:  
**Surface/Bottom**

Depth (ft.): 2 / 10  
 Water Temp (°C): 28.7 / 28.2  
 Cond. (µS/cm): 22100 / 23850  
 D.O (mg/L): 6.6 / 3.0  
 pH: 7.9 / 7.5  
 Salinity: 13.2 / 14.4

**ENVIRONMENTAL CONDITIONS**

WEATHER CODE: 1  
 0 Clear                           5 Drizzle  
 1 Partly Cloudy               6 Rain  
 2 Continuous Clouds         7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand       8 Showers  
 4 Fog/Haze                   9 Thunder Storms

WIND DIRECTION CODE: 4  
 1 N                               5 S  
 2 NE                           6 SW  
 3 E                               7 W  
 4 SE                           8 NW

Wind Velocity: 06

TIDE CODE: 1  
 1 Ebb                           3 Flood  
 2 Slack After Ebb           4 Slack After Flood

Rain within the last 48 hours? (circle) YES  NO   
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle)  YES  NO  
 Media Sampled (circle one): Oysters  Water   
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



| CHAIN OF CUSTODY  |     |       |       |
|-------------------|-----|-------|-------|
| Transferred From: | To: | Date: | Time: |
|                   |     |       |       |
|                   |     |       |       |
|                   |     |       |       |

Field Data Collection Sheet

Date: 8/11/20  
 Time: 900

**SAMPLING TEAM**  
C. Wose  
R. Snader

**LOCATION**  
 Water Body: Bay / Drum Point / Pax  
 Bottle #: FB-9B  
 GPS Coordinates: Latitude: 38° 20' 00.0"  
 Longitude: 76° 24' 27.2"

**DATA PARAMETERS**  
 Air Temp: 26 °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 7  
 Water Temp (°C): 28.8 / 28.5  
 Cond. (µS/cm): 22480 / 23210  
 D.O (mg/L): 6.7 / 4.4  
 pH: 8.0 / 7.7  
 Salinity: 13.5 / 14.0

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
 WIND DIRECTION CODE: 4  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 06  
 TIDE CODE: 1  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From: | To: | Date: | Time: |
|-------------------|-----|-------|-------|
|                   |     |       |       |
|                   |     |       |       |
|                   |     |       |       |

### Field Data Collection Sheet

Date: 8/11/20  
 Time: 900

**SAMPLING TEAM**  
C. Wose  
R. Snader

**LOCATION**  
 Water Body: Pat. River  
 Bottle #: DP-W1  
 GPS Coordinates: Latitude: 38° 20' 00.0"  
 Longitude: 76° 24' 27.2"

**DATA PARAMETERS**  
 Air Temp: 26 @ F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 1 7  
 Water Temp (°C): 28.8 / 28.5  
 Cond. (µS/cm): 22480 / 23210  
 D.O (mg/L): 6.7 / 4.4  
 pH: 8.0 / 7.7  
 Salinity: 13.5 / 14.0

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
 0 Clear 5 Drizzle  
 1 Partly Cloudy 6 Rain  
 2 Continuous Clouds 7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand 8 Showers  
 4 Fog/Haze 9 Thunder Storms  
**WIND DIRECTION CODE:** 4  
 1 N 5 S  
 2 NE 6 SW  
 3 E 7 W  
 4 SE 8 NW  
 Wind Velocity: 06  
**TIDE CODE:** 1  
 1 Ebb 3 Flood  
 2 Slack After Ebb 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From: | To: | Date: | Time: |
|-------------------|-----|-------|-------|
|                   |     |       |       |
|                   |     |       |       |
|                   |     |       |       |
|                   |     |       |       |

Field Data Collection Sheet

Date: 8/18/20  
 Time: 7:00

**SAMPLING TEAM**  
R. Snader  
C. Wose

**LOCATION**  
 Water Body: Pat. River  
 Bottle #: TB-203  
 GPS Coordinates: Latitude: \_\_\_\_\_  
 Longitude: \_\_\_\_\_

**DATA PARAMETERS**  
 Air Temp: \_\_\_\_\_ °C / °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / \_\_\_\_\_  
 Water Temp (°C): \_\_\_\_\_ / \_\_\_\_\_  
 Cond. (µS/cm): \_\_\_\_\_ / \_\_\_\_\_  
 D.O (mg/L): \_\_\_\_\_ / \_\_\_\_\_  
 pH: 1 / \_\_\_\_\_  
 Salinity: \_\_\_\_\_ / \_\_\_\_\_

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear                      5 Drizzle  
 1 Partly Cloudy          6 Rain  
 2 Continuous Clouds    7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand    8 Showers  
 4 Fog/Haze                9 Thunder Storms  
 WIND DIRECTION CODE: 8  
 1 N                            5 S  
 2 NE                        6 SW  
 3 E                            7 W  
 4 SE                         8 NW  
 Wind Velocity: 02  
 TIDE CODE: 3  
 1 Ebb                        3 Flood  
 2 Slack After Ebb        4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor: \_\_\_\_\_



**CHAIN OF CUSTODY**

| Transferred From:  | To: | Date:          | Time: |
|--------------------|-----|----------------|-------|
| <u>Ryan Snader</u> |     | <u>8/18/20</u> |       |
|                    |     |                |       |
|                    |     |                |       |
|                    |     |                |       |

**Field Data Collection Sheet**

Date: 8/18/20  
 Time: 10:40

**SAMPLING TEAM**  
R. Snader  
C. Wose

**LOCATION**  
 Water Body: Pax. River  
 Bottle #: FB-9B  
 GPS Coordinates: Latitude: 38° 18.874'  
 Longitude: 76° 27.107'

**DATA PARAMETERS**  
 Air Temp: 26 °(C) F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 13  
 Water Temp (°C): 27.5 / 27.3  
 Cond. (µS/cm): 20706 / 21400  
 O.O (mg/L): 6.8 / 5.3  
 pH: 7.8 / 7.7  
 Salinity: 12.3 / 12.8

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear                               5 Drizzle  
 1 Partly Cloudy                   6 Rain  
 2 Continuous Clouds           7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand           8 Showers  
 4 Fog/Haze                           9 Thunder Storms  
 WIND DIRECTION CODE: 8  
 1 N                                       5 S  
 2 NE                                   6 SW  
 3 E                                       7 W  
 4 SE                                   8 NW  
 Wind Velocity: 02  
 TIDE CODE: 3  
 1 Ebb                                   3 Flood  
 2 Slack After Ebb               4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: \_\_\_\_\_  
 With (W) or Without (WO) oyster liquor: \_\_\_\_\_



| <b>CHAIN OF CUSTODY</b> |     |                |       |
|-------------------------|-----|----------------|-------|
| Transferred From:       | To: | Date:          | Time: |
| <u>Ryan Snader</u>      |     | <u>8/18/20</u> |       |
|                         |     |                |       |
|                         |     |                |       |
|                         |     |                |       |



Field Data Collection Sheet

Date: 8/18/20  
 Time: 10:40

**SAMPLING TEAM**  
R. Snader  
C. Wose

**LOCATION**  
 Water Body: Pax River  
 Bottle #: DP-01L  
 GPS Coordinates: Latitude: 38° 18.8 74'  
 Longitude: 76° 27.107

**DATA PARAMETERS**  
 Air Temp: 26 °C / °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 13  
 Water Temp (°C): 27.5 / 27.3  
 Cond. (µS/cm): 20700 / 21400  
 D.O (mg/L): 6.8 / 5.3  
 pH: 7.8 / 7.7  
 Salinity: 12.3 / 12.8

**ENVIRONMENTAL CONDITIONS**  
 WEATHER CODE: 1  
 0 Clear                      5 Drizzle  
 1 Partly Cloudy          6 Rain  
 2 Continuous Clouds      7 Snow or Snow w/ Rain  
 3 Blowing Snow/Sand      8 Showers  
 4 Fog/Haze                  9 Thunder Storms  
 WIND DIRECTION CODE: 8  
 1 N                              5 S  
 2 NE                            6 SW  
 3 E                               7 W  
 4 SE                             8 NW  
 Wind Velocity: 02  
 TIDE CODE: 03  
 1 Ebb                            3 Flood  
 2 Slack After Ebb          4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: 12  
 With (W) or Without (WO) oyster liquor w



**CHAIN OF CUSTODY**

| Transferred From:  | To: | Date:          | Time: |
|--------------------|-----|----------------|-------|
| <u>Ryan Snader</u> |     | <u>8/18/20</u> |       |
|                    |     |                |       |
|                    |     |                |       |

Field Data Collection Sheet

Date: 8/18/20  
 Time: 10:40

**SAMPLING TEAM**  
R. Snader  
C. Wose

**LOCATION**  
 Water Body: Pax. River  
 Bottle #: DP-01  
 GPS Coordinates: Latitude: 38° 18.874'  
 Longitude: 76° 27.107'

**DATA PARAMETERS**  
 Air Temp: 26 °F  
 Water Quality:  
**Surface/Bottom**  
 Depth (ft.): 1 / 13  
 Water Temp (°C): 27.5 / 27.3  
 Cond. (µS/cm): 20700 / 21400  
 D.O (mg/L): 6.8 / 5.3  
 pH: 7.8 / 7.7  
 Salinity: 12.3 / 12.8

**ENVIRONMENTAL CONDITIONS**  
**WEATHER CODE:** 1  
 0 Clear  
 1 Partly Cloudy  
 2 Continuous Clouds  
 3 Blowing Snow/Sand  
 4 Fog/Haze  
 5 Drizzle  
 6 Rain  
 7 Snow or Snow w/ Rain  
 8 Showers  
 9 Thunder Storms  
**WIND DIRECTION CODE:** 8  
 1 N  
 2 NE  
 3 E  
 4 SE  
 5 S  
 6 SW  
 7 W  
 8 NW  
 Wind Velocity: 02  
**TIDE CODE:** 3  
 1 Ebb  
 2 Slack After Ebb  
 3 Flood  
 4 Slack After Flood  
 Rain within the last 48 hours? (circle) YES NO  
**PUT BOTTLES IN COOLER AND ICED**  
 Samples Iced? (circle) YES NO  
 Media Sampled (circle one): Oysters Water  
 Number of oysters collected: 12  
 With (W) or Without (WO) oyster liquor w/o



**CHAIN OF CUSTODY**

| Transferred From:  | To: | Date:          | Time: |
|--------------------|-----|----------------|-------|
| <u>Ryan Snader</u> |     | <u>8/18/20</u> |       |
|                    |     |                |       |
|                    |     |                |       |

## **APPENDIX 2: LABORATORY RESULTS**



ANALYTICAL REPORT

|                 |  |
|-----------------|--|
| Lab Number:     | L2028494   |
| Client:         | Maryland Department of the Environment<br>1800 Washington Boulevard<br>Baltimore, MD 21230 |
| ATTN:           | Amy Laliberte  |
| Phone:          | (410) 537-3614   |
| Project Name:   | PFAS STUDY   |
| Project Number: | Not Specified  |
| Report Date:    | 07/20/20   |

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

Certifications & Approvals: MA (M MA030), NH NELAP (2062), CT (PH 0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA0030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68 02089), RI (LA000299), TX (T104704419), VT (VT 0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330 17 00150), USFWS (Permit #206964).

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



Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

| Alpha<br>Sample ID | Client ID | Matrix | Sample<br>Location | Collection<br>Date/Time | Receive Date |
|--------------------|-----------|--------|--------------------|-------------------------|--------------|
| L2028494-01        | T004      | WATER  | Not Specified      | 07/07/20 06:05          | 07/07/20     |
| L2028494-02        | FB-6A     | WATER  | Not Specified      | 07/07/20 08:22          | 07/07/20     |
| L2028494-03        | SC-W1     | WATER  | Not Specified      | 07/07/20 08:22          | 07/07/20     |
| L2028494-04        | SC-W1R    | WATER  | Not Specified      | 07/07/20 08:27          | 07/07/20     |
| L2028494-05        | FB-4A     | WATER  | Not Specified      | 07/07/20 08:44          | 07/07/20     |
| L2028494-06        | T4-W3     | WATER  | Not Specified      | 07/07/20 08:44          | 07/07/20     |
| L2028494-07        | T4-W2     | WATER  | Not Specified      | 07/07/20 08:52          | 07/07/20     |
| L2028494-08        | CC-W1     | WATER  | Not Specified      | 07/07/20 09:04          | 07/07/20     |
| L2028494-09        | T4-W1     | WATER  | Not Specified      | 07/07/20 08:59          | 07/07/20     |
| L2028494-10        | FB-8C     | WATER  | Not Specified      | 07/07/20 09:14          | 07/07/20     |
| L2028494-11        | WFDS-W6   | WATER  | Not Specified      | 07/07/20 09:14          | 07/07/20     |
| L2028494-12        | WFDS-W5   | WATER  | Not Specified      | 07/07/20 09:20          | 07/07/20     |
| L2028494-13        | FB-WWEFF  | WATER  | Not Specified      | 07/07/20 10:00          | 07/07/20     |
| L2028494-14        | WWTP-EFF  | WATER  | Not Specified      | 07/07/20 10:38          | 07/07/20     |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

### Case Narrative

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

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

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

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

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

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

---



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**Case Narrative (continued)**

Perfluorinated Alkyl Acids by Isotope Dilution

L2028494-10: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

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

Authorized Signature:

 Alycia Mogayzel

Title: Technical Director/Representative

Date: 07/20/20

# ORGANICS





# SEMIVOLATILES



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

**Lab ID:** L2028494-01  
**Client ID:** T004  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 06:05  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 16:57  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/10/20 10:31

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.83 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.83 | --  | 1               |



Serial\_No:07202014:51

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-01  
Client ID: T004  
Sample Location: Not Specified

Date Collected: 07/07/20 06:05  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 97         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 72         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 87         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 91         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 100        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 89         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 96         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 89         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 85         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 81         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 95         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 86         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 81         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 61         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

**Lab ID:** L2028494-02  
**Client ID:** FB-6A  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 08:22  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 17:14  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/10/20 10:31

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.88 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.88 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.88 | --  | 1               |



Serial\_No:07202014:51

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

**Lab ID:** L2028494-02  
**Client ID:** FB-6A  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 08:22  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 103        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 80         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 87         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 92         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 104        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 94         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 98         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 102        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 91         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 77         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 98         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 101        |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 87         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 61         |           | 33-143              |



Serial\_No:07202014:51

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

**Lab ID:** L2028494-03  
**Client ID:** SC-W1  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 08:22  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 17:31  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/10/20 10:31

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.03   |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 1.94   |           | ng/l  | 1.80 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 2.28   |           | ng/l  | 1.80 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.80 | --  | 1               |



Serial\_No:07202014:51

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-03  
Client ID: SC-W1  
Sample Location: Not Specified

Date Collected: 07/07/20 08:22  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 92         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 133        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 78         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 86         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 93         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 92         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 95         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 88         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 87         |           | 58-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 78         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 86         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 69         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 83         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 75         |           | 33-143              |



Serial\_No:07202014:51

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

**Lab ID:** L2028494-04  
**Client ID:** SC-W1R  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 08:27  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 18:04  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/10/20 10:31

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.20   |           | ng/l  | 1.82 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 1.93   |           | ng/l  | 1.82 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 2.12   |           | ng/l  | 1.82 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.82 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.82 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.82 | --  | 1               |





Serial\_No:07202014:51

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-04  
Client ID: SC-W1R  
Sample Location: Not Specified

Date Collected: 07/07/20 08:27  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 100        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 139        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 80         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 87         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 99         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 88         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 90         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 96         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 84         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 62         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 77         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 87         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 70         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 47         |           | 33-143              |



Serial\_No:07202014:51

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-05  
Client ID: FB-4A  
Sample Location: Not Specified

Date Collected: 07/07/20 08:44  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:  
Matrix: Water  
Analytical Method: 134,LCMSMS-ID  
Analytical Date: 07/16/20 18:54  
Analyst: RS

Extraction Method: ALPHA 23528  
Extraction Date: 07/10/20 10:31

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.77 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.77 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.77 | --  | 1               |



Serial\_No:07202014:51

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-05  
 Client ID: FB-4A  
 Sample Location: Not Specified

Date Collected: 07/07/20 08:44  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 148        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 74         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 120        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 111        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 124        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 96         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 91         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 100        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 95         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 53         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 75         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 52         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 67         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 44         |           | 33-143              |



Serial\_No:07202014:51

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-06  
Client ID: T4-W3  
Sample Location: Not Specified

Date Collected: 07/07/20 08:44  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:  
Matrix: Water  
Analytical Method: 134,LCMSMS-ID  
Analytical Date: 07/16/20 19:10  
Analyst: RS

Extraction Method: ALPHA 23528  
Extraction Date: 07/10/20 10:31

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.03   |           | ng/l  | 1.88 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.88 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.88 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.88 | --  | 1               |



Serial\_No:07202014:51

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-06  
Client ID: T4-W3  
Sample Location: Not Specified

Date Collected: 07/07/20 08:44  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 129        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 123        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 112        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 108        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 114        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 96         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 82         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 88         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 83         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 50         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 75         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 47         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 66         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 54         |           | 33-143              |



Serial\_No:07202014:51

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-06  
Client ID: T4-W3  
Sample Location: Not Specified

Date Collected: 07/07/20 08:44  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 129        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 123        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 112        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 108        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 114        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 96         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 82         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 88         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 83         |           | 58-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 50         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 75         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 47         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 66         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 54         |           | 33-143              |



Serial\_No:07202014:51

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-07  
Client ID: T4-W2  
Sample Location: Not Specified

Date Collected: 07/07/20 08:52  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 134        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 116        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 101        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 98         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 119        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 90         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 80         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 92         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 80         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 45         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 68         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 48         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 60         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 47         |           | 33-143              |



Serial\_No:07202014:51

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

**Lab ID:** L2028494-08  
**Client ID:** CC-W1  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:04  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 19:43  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/10/20 10:31

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.01   |           | ng/l  | 1.77 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 5.26   |           | ng/l  | 1.77 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.77 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.77 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.77 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.77 | --  | 1               |





Serial\_No:07202014:51

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-08  
Client ID: CC-W1  
Sample Location: Not Specified

Date Collected: 07/07/20 09:04  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 124        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 123        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 106        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 105        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 117        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 97         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 89         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 96         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 86         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 45         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 84         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 58         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 61         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 55         |           | 33-143              |



Serial\_No:07202014:51

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-09  
Client ID: T4-W1  
Sample Location: Not Specified

Date Collected: 07/07/20 08:59  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:  
Matrix: Water  
Analytical Method: 134,LCMSMS-ID  
Analytical Date: 07/16/20 20:00  
Analyst: RS

Extraction Method: ALPHA 23528  
Extraction Date: 07/10/20 10:31

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.74 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.02   |           | ng/l  | 1.74 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.74 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.74 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.74 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.74 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 1.98   |           | ng/l  | 1.74 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.74 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.74 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.74 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.74 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.74 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.74 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.74 | --  | 1               |



Serial\_No:07202014:51

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-09  
 Client ID: T4-W1  
 Sample Location: Not Specified

Date Collected: 07/07/20 08:59  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 127        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 123        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 103        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 102        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 117        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 90         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 83         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 90         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 82         |           | 58-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 37         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 70         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 64         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 46         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 41         |           | 33-143              |



Serial\_No:07202014:51

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-10  
Client ID: FB-8C  
Sample Location: Not Specified

Date Collected: 07/07/20 09:14  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:  
Matrix: Water  
Analytical Method: 134,LCMSMS-ID  
Analytical Date: 07/16/20 20:17  
Analyst: RS

Extraction Method: ALPHA 23528  
Extraction Date: 07/10/20 10:31

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.84 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.84 | --  | 1               |



Serial\_No:07202014:51

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-10  
Client ID: FB-8C  
Sample Location: Not Specified

Date Collected: 07/07/20 09:14  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 158        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 74         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 122        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 112        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 131        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 93         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 88         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 100        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 87         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 52         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 76         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 44         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 48         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 30         | Q         | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

**Lab ID:** L2028494-11  
**Client ID:** WFDS-W6  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:14  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 20:33  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/10/20 10:31

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 2.02   |           | ng/l  | 1.98 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 2.11   |           | ng/l  | 1.98 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.98 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.98 | --  | 1               |



Serial\_No:07202014:51

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-11  
Client ID: WFDS-W6  
Sample Location: Not Specified

Date Collected: 07/07/20 09:14  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 123        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 106        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 103        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 100        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 108        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 89         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 78         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 85         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 76         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 43         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 66         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 39         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 57         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 44         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-12  
 Client ID: WFDS-W5  
 Sample Location: Not Specified

Date Collected: 07/07/20 09:20  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:  
 Matrix: Water  
 Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 07/16/20 20:50  
 Analyst: RS

Extraction Method: ALPHA 23528  
 Extraction Date: 07/10/20 10:31

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.87 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.03   |           | ng/l  | 1.87 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.87 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.87 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.87 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.87 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 1.95   |           | ng/l  | 1.87 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.87 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.87 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.87 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.87 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.87 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.87 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.87 | --  | 1               |





Serial\_No:07202014:51

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-12  
Client ID: WFDS-W5  
Sample Location: Not Specified

Date Collected: 07/07/20 09:20  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 126        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 111        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 105        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 105        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 117        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 91         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 78         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 90         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 77         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 48         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 67         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 33         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 53         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 44         |           | 33-143              |



Serial\_No:07202014:51

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-13  
Client ID: FB-WWEFF  
Sample Location: Not Specified

Date Collected: 07/07/20 10:00  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:  
Matrix: Water  
Analytical Method: 134,LCMSMS-ID  
Analytical Date: 07/16/20 21:06  
Analyst: RS

Extraction Method: ALPHA 23528  
Extraction Date: 07/10/20 10:31

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.83 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.83 | --  | 1               |



Serial\_No:07202014:51

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-13  
 Client ID: FB-WWEFF  
 Sample Location: Not Specified

Date Collected: 07/07/20 10:00  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 149        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 70         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 117        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 109        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 125        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 94         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 91         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 95         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 90         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 53         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 79         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 30         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 78         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 47         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

**Lab ID:** L2028494-14  
**Client ID:** WWTP-EFF  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 10:38  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 21:23  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/10/20 10:31

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | 16.0   |           | ng/l  | 2.00 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 49.4   |           | ng/l  | 2.00 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | 9.83   |           | ng/l  | 2.00 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | 273    |           | ng/l  | 2.00 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 23.6   |           | ng/l  | 2.00 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | 4.86   |           | ng/l  | 2.00 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 147    |           | ng/l  | 2.00 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 2.00 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 2.00 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 2.00 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 2.00 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 2.00 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 2.00 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 2.00 | --  | 1               |



Serial\_No:07202014:51

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028494-14  
 Client ID: WWTP-EFF  
 Sample Location: Not Specified

Date Collected: 07/07/20 10:38  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 103        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 125        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 62         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 68         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 98         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 69         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 63         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 83         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 59         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 22         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 49         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 24         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 37         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 38         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**Method Blank Analysis**  
**Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
Analytical Date: 07/16/20 15:51  
Analyst: RS

Extraction Method: ALPHA 23528  
Extraction Date: 07/10/20 10:33

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-14 Batch: WG1390837-1</b> |        |           |       |      |     |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDA)   | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/l  | 2.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/l  | 2.00 | --  |

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 07/16/20 15:51  
 Analyst: RS

Extraction Method: ALPHA 23528  
 Extraction Date: 07/10/20 10:33

| Parameter  | Result | Qualifier | Units | RL | MDL |
|--|--------|-----------|-------|----|-----|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-14 Batch: WG1390837-1 |        |           |       |    |     |

| Surrogate (Extracted Internal Standard)                                | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)                                   | 96        |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)                                | 126       |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 103       |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)         | 76        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 91        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 95        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 103       |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 95        |           | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)         | 71        |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 103       |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 102       |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 95        |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)         | 85        |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 83        |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 107       |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                              | 19        |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 126       |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 97        |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 75        |           | 33-143              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-14 Batch: WG1390837-2 WG1390837-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)   | 111       |      | 109       |      | 65-157           | 2   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 115       |      | 112       |      | 59-188           | 3   |      | 30         |
| Perfluorooheptanoic Acid (PFHpA)  | 112       |      | 107       |      | 58-159           | 5   |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | 109       |      | 107       |      | 59-177           | 2   |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 126       |      | 124       |      | 63-159           | 2   |      | 30         |
| Perfluorononanoic Acid (PFNA)   | 110       |      | 107       |      | 68-171           | 3   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 115       |      | 108       |      | 52-151           | 6   |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | 105       |      | 104       |      | 63-171           | 1   |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | 123       |      | 128       |      | 80-186           | 4   |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | 114       |      | 111       |      | 60-153           | 3   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)  | 113       |      | 110       |      | 45-170           | 3   |      | 30         |
| Perfluorododecanoic Acid (PFDDA)  | 99        |      | 88        |      | 67-153           | 12  |      | 30         |
| Perfluorotridecanoic Acid (PFTDA)   | 120       |      | 101       |      | 48-158           | 17  |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | 129       |      | 125       |      | 59-182           | 3   |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028494  
Report Date: 07/20/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits    | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|---------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                     |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-14 Batch: WG1390837-2 WG1390837-3 |           |      |           |      |                     |     |      |            |
| Surrogate (Extracted Internal Standard)   | LCS       |      | LCSD      |      | Acceptance Criteria |     |      |            |
|   | %Recovery | Qual | %Recovery | Qual |                     |     |      |            |
| Perfluoro[13C4]Butanoic Acid (MPFBA)  | 95        |      | 95        |      | 2-156               |     |      |            |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)   | 122       |      | 124       |      | 16-173              |     |      |            |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)   | 105       |      | 101       |      | 31-159              |     |      |            |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)  | 87        |      | 86        |      | 1-313               |     |      |            |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)  | 93        |      | 93        |      | 21-145              |     |      |            |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)   | 97        |      | 95        |      | 30-139              |     |      |            |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)  | 104       |      | 103       |      | 47-153              |     |      |            |
| Perfluoro[13C8]Octanoic Acid (M8PFDA)   | 95        |      | 98        |      | 36-149              |     |      |            |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)  | 77        |      | 83        |      | 1-244               |     |      |            |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)   | 102       |      | 105       |      | 34-146              |     |      |            |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)   | 95        |      | 98        |      | 42-146              |     |      |            |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)   | 96        |      | 96        |      | 38-144              |     |      |            |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)  | 84        |      | 89        |      | 7-170               |     |      |            |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)  | 82        |      | 81        |      | 1-181               |     |      |            |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)   | 95        |      | 100       |      | 40-144              |     |      |            |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)   | 26        |      | 23        |      | 1-87                |     |      |            |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)   | 98        |      | 98        |      | 23-146              |     |      |            |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPDDA)  | 88        |      | 101       |      | 24-181              |     |      |            |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)  | 82        |      | 79        |      | 33-143              |     |      |            |





**Matrix Spike Analysis**  
Batch Quality Control

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

| Parameter   | Native Sample | MS Added | MS Found | MS %Recovery | Qual | MSD Found | MSD %Recovery | Qual | Recovery Limits | RPD | Qual | RPD Limits |
|---|---------------|----------|----------|--------------|------|-----------|---------------|------|-----------------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1390837-4 QC Sample: L2028494-03 Client ID: SC-W1 |               |          |          |              |      |           |               |      |                 |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)   | ND            | 33.6     | 37.8     | 113          | -    | -         | -             | -    | 65-157          | -   | -    | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 2.03          | 37.9     | 45.0     | 113          | -    | -         | -             | -    | 69-168          | -   | -    | 30         |
| Perfluorohexanoic Acid (PFHxA)  | ND            | 37.9     | 42.6     | 112          | -    | -         | -             | -    | 58-159          | -   | -    | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND            | 34.6     | 38.5     | 111          | -    | -         | -             | -    | 69-177          | -   | -    | 30         |
| Perfluorooctanoic Acid (PFOA)   | 1.94          | 37.9     | 48.2     | 122          | -    | -         | -             | -    | 63-159          | -   | -    | 30         |
| Perfluorononanoic Acid (PFNA)   | ND            | 37.9     | 41.3     | 109          | -    | -         | -             | -    | 68-171          | -   | -    | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 2.28          | 35.1     | 41.0     | 110          | -    | -         | -             | -    | 52-151          | -   | -    | 30         |
| Perfluorodecanoic Acid (PFDA)   | ND            | 37.9     | 41.0     | 106          | -    | -         | -             | -    | 63-171          | -   | -    | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND            | 37.9     | 45.3     | 119          | -    | -         | -             | -    | 60-166          | -   | -    | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | ND            | 37.9     | 40.0     | 105          | -    | -         | -             | -    | 60-153          | -   | -    | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | ND            | 37.9     | 37.1     | 98           | -    | -         | -             | -    | 45-170          | -   | -    | 30         |
| Perfluorododecanoic Acid (PFDoA)  | ND            | 37.9     | 32.6     | 86           | -    | -         | -             | -    | 67-153          | -   | -    | 30         |
| Perfluorotridecanoic Acid (PFTiDA)  | ND            | 37.9     | 39.5     | 104          | -    | -         | -             | -    | 48-158          | -   | -    | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | ND            | 37.9     | 47.2     | 124          | -    | -         | -             | -    | 59-182          | -   | -    | 30         |

| Surrogate (Extracted Internal Standard)                                | MS         |           | MSD        |           | Acceptance Criteria |
|--|------------|-----------|------------|-----------|---------------------|
|  | % Recovery | Qualifier | % Recovery | Qualifier |                     |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 142        |           |            |           | 1-313               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5 NEFOSAA)   | 105        |           |            |           | 23-146              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 84         |           |            |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 87         |           |            |           | 40-144              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 86         |           |            |           | 38-144              |



**Matrix Spike Analysis**  
Batch Quality Control

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

| Parameter   | Native Sample | MS Added  | MS Found   | MS %Recovery | Qual                | MSD Found | MSD %Recovery | Qual | Recovery Limits | RPD | Qual | RPD Limits |   |    |  |     |  |                     |            |           |            |           |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
|---|---------------|-----------|------------|--------------|---------------------|-----------|---------------|------|-----------------|-----|------|------------|---|----|--|-----|--|---------------------|------------|-----------|------------|-----------|--|----|--|--|--|--------|---|----|--|--|--|--------|--|----|--|--|--|--------|---|----|--|--|--|--------|--|----|--|--|--|--------|---|----|--|--|--|--------|---------------------------------------|----|--|--|--|--------|---------------------------------------|----|--|--|--|--------|---|----|--|--|--|--------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1390837-4 QC Sample: L2028494-03 Client ID: SC-W1   |               |           |            |              |                     |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| <table border="1"> <thead> <tr> <th rowspan="2">Surrogate (Extracted Internal Standard)</th> <th colspan="2">MS</th> <th colspan="2">MSD</th> <th rowspan="2">Acceptance Criteria</th> </tr> <tr> <th>% Recovery</th> <th>Qualifier</th> <th>% Recovery</th> <th>Qualifier</th> </tr> </thead> <tbody> <tr> <td>Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)</td> <td>79</td> <td></td> <td></td> <td></td> <td>21-145</td> </tr> <tr> <td>Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)</td> <td>85</td> <td></td> <td></td> <td></td> <td>30-139</td> </tr> <tr> <td>Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)</td> <td>99</td> <td></td> <td></td> <td></td> <td>47-153</td> </tr> <tr> <td>Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)</td> <td>83</td> <td></td> <td></td> <td></td> <td>24-161</td> </tr> <tr> <td>Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)</td> <td>71</td> <td></td> <td></td> <td></td> <td>33-143</td> </tr> <tr> <td>Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)</td> <td>91</td> <td></td> <td></td> <td></td> <td>42-146</td> </tr> <tr> <td>Perfluoro[13C8]Octanoic Acid (M8PFOA)</td> <td>91</td> <td></td> <td></td> <td></td> <td>36-149</td> </tr> <tr> <td>Perfluoro[13C9]Nonanoic Acid (M9PFNA)</td> <td>91</td> <td></td> <td></td> <td></td> <td>34-146</td> </tr> <tr> <td>Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)</td> <td>96</td> <td></td> <td></td> <td></td> <td>31-159</td> </tr> </tbody> </table> |               |           |            |              |                     |           |               |      |                 |     |      |            | Surrogate (Extracted Internal Standard) | MS |  | MSD |  | Acceptance Criteria | % Recovery | Qualifier | % Recovery | Qualifier | Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA) | 79 |  |  |  | 21-145 | Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA) | 85 |  |  |  | 30-139 | Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS) | 99 |  |  |  | 47-153 | Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA) | 83 |  |  |  | 24-161 | Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA) | 71 |  |  |  | 33-143 | Perfluoro[13C8]Octanesulfonic Acid (M8PFOS) | 91 |  |  |  | 42-146 | Perfluoro[13C8]Octanoic Acid (M8PFOA) | 91 |  |  |  | 36-149 | Perfluoro[13C9]Nonanoic Acid (M9PFNA) | 91 |  |  |  | 34-146 | Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS) | 96 |  |  |  | 31-159 |
| Surrogate (Extracted Internal Standard)   | MS            |           | MSD        |              | Acceptance Criteria |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
|   | % Recovery    | Qualifier | % Recovery | Qualifier    |                     |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)  | 79            |           |            |              | 21-145              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)   | 85            |           |            |              | 30-139              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)  | 99            |           |            |              | 47-153              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)   | 83            |           |            |              | 24-161              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)  | 71            |           |            |              | 33-143              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)   | 91            |           |            |              | 42-146              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)   | 91            |           |            |              | 36-149              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)   | 91            |           |            |              | 34-146              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)   | 96            |           |            |              | 31-159              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |



Project Name: PFAS STUDY  
Project Number: Not Specified

**Lab Duplicate Analysis**  
Batch Quality Control

Lab Number: L2028494  
Report Date: 07/20/20

| Parameter  | Native Sample | Duplicate Sample | Units | RPD | Qual | RPD Limits |
|--|---------------|------------------|-------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1390837-5 QC Sample: L2028494-04 Client ID: SC-W1R |               |                  |       |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)  | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorohexanoic Acid (PFHxA)   | 2.20          | 1.96             | ng/l  | 12  |      | 30         |
| Perfluoroheptanoic Acid (PFHpA)  | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorooctanoic Acid (PFOA)  | 1.93          | 1.84F            | ng/l  | 5   |      | 30         |
| Perfluorononanoic Acid (PFNA)  | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)  | 2.12          | 2.31             | ng/l  | 9   |      | 30         |
| Perfluorodecanoic Acid (PFDA)  | ND            | ND               | ng/l  | NC  |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)  | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)   | ND            | ND               | ng/l  | NC  |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)  | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorododecanoic Acid (PFDoA)   | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorotridecanoic Acid (PFTTrDA)  | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)   | ND            | ND               | ng/l  | NC  |      | 30         |

| Surrogate (Extracted Internal Standard)                        | %Recovery | Qualifier | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|-----------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)              | 100       |           | 125       |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS) | 139       |           | 126       |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)               | 80        |           | 94        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                | 87        |           | 97        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)             | 99        |           | 117       |           | 47-153              |

Page 41 of 66



Serial\_No:07202014:51

Project Name: PFAS STUDY  
Project Number: Not Specified

**Lab Duplicate Analysis**  
Batch Quality Control

Lab Number: L2028494  
Report Date: 07/20/20

| Parameter  | Native Sample | Duplicate Sample | Units | RPD | Qual | RPD Limits |
|--|---------------|------------------|-------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1390837-5 QC Sample: L2028494-04 Client ID: SC-W1R |               |                  |       |     |      |            |

| Surrogate (Extracted Internal Standard)                                | %Recovery | Qualifier | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|-----------|-----------|---------------------|
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 88        |           | 87        |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 90        |           | 88        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 96        |           | 96        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 84        |           | 87        |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 62        |           | 44        |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUUA)                | 77        |           | 78        |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEFOSAA)   | 87        |           | 37        |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 70        |           | 65        |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 47        |           | 55        |           | 33-143              |

Page 42 of 66



Project Name: PFAS STUDY  
 Project Number: Not Specified

Serial\_No:07202014:51  
 Lab Number: L2028494  
 Report Date: 07/20/20

**Sample Receipt and Container Information**

Were project specific reporting limits specified? YES

**Cooler Information**

Cooler                      Custody Seal  
 A                              Absent

**Container Information**

| Container ID | Container Type                      | Cooler | Initial pH | Final pH | Temp deg C | Pres | Seal   | Frozen Date/Time | Analysis(*)        |
|--------------|-------------------------------------|--------|------------|----------|------------|------|--------|------------------|--------------------|
| L2028494-01A | 2 Plastic(1) Plastic(1) H2O Plastic | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-02A | 2 Plastic(1) Plastic(1) H2O Plastic | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-03A | 2 Plastic(1) Plastic(1) H2O Plastic | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-03B | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-04A | 2 Plastic(1) Plastic(1) H2O Plastic | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-04B | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-05A | 2 Plastic(1) Plastic(1) H2O Plastic | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-06A | 2 Plastic(1) Plastic(1) H2O Plastic | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-06B | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-07A | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-07B | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-08A | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-08B | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-09A | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-09B | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-10A | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-11A | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-11B | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-12A | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-12B | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-13A | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-14A | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2028494-14B | Plastic 250ml unpreserved           | A      | NA         |          | 2.7        | Y    | Absent |                  | A2-537-ISOTOPE(14) |

\*Values in parentheses indicate holding time in days



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Serial\_No:** 07202014:51  
**Lab Number:** L2028494  
**Report Date:** 07/20/20

**Container Information**

**Container ID**   **Container Type**

| <b>Cooler</b> | <b>Initial<br/>pH</b> | <b>Final<br/>pH</b> | <b>Temp<br/>deg C</b> | <b>Pres</b> | <b>Seal</b> | <b>Frozen<br/>Date/Time</b> | <b>Analysis(*)</b> |
|---------------|-----------------------|---------------------|-----------------------|-------------|-------------|-----------------------------|--------------------|
|---------------|-----------------------|---------------------|-----------------------|-------------|-------------|-----------------------------|--------------------|

\*Values in parentheses indicate holding time in days



Project Name: PFAS STUDY  
 Project Number:

Serial\_No:07202014:51  
 Lab Number: L2028494  
 Report Date: 07/20/20

**PFAS PARAMETER SUMMARY**

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



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

## GLOSSARY

### Acronyms

|                 |  |
|-----------------|--|
| <b>DL</b>       | - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  |
| <b>EDL</b>      | - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME)  |
| <b>EMPC</b>     | - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.   |
| <b>EPA</b>      | - Environmental Protection Agency.   |
| <b>LCS</b>      | - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.  |
| <b>LCSd</b>     | - Laboratory Control Sample Duplicate: Refer to LCS.   |
| <b>LIB</b>      | - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.   |
| <b>LOD</b>      | - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)   |
| <b>LOQ</b>      | - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)<br><br>Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) |
| <b>MDL</b>      | - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.  |
| <b>MS</b>       | - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 3320, the spike recovery is calculated using the native concentration, including estimated values.   |
| <b>MSD</b>      | - Matrix Spike Sample Duplicate: Refer to MS.  |
| <b>NA</b>       | - Not Applicable.  |
| <b>NC</b>       | - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.   |
| <b>NDPA/DPA</b> | - N-Nitrosodiphenylamine/Diphenylamine.  |
| <b>NI</b>       | - Not Identifiable.  |
| <b>NP</b>       | - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.  |
| <b>RI</b>       | - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RI includes any adjustments from dilutions, concentrations or moisture content, where applicable.   |
| <b>RPD</b>      | - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values, although the RPD value will be provided in the report.  |
| <b>SRM</b>      | - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.   |
| <b>STLP</b>     | - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.  |
| <b>TEF</b>      | - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.   |
| <b>TEQ</b>      | - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.  |
| <b>TIC</b>      | - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.  |

### Footnotes

Report Format: Data Usability Report



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

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

#### Terms

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1.8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

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

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

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 18 hours from sample collection, value will be reflected in **bold**.

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

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

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (S)' result is defined as the summation of results for: PFOA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

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

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

#### Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration. (DOD and NYSDEC Part 375 PFAS only.)
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP/CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration

Report Format: Data Usability Report



**Project Name:** PFAS STUDY

**Lab Number:** L2028494

**Project Number:** Not Specified

**Report Date:** 07/20/20

**Data Qualifiers**

Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only)

- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028494  
**Report Date:** 07/20/20

**REFERENCES**

- 134 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) using Isotope Dilution. Alpha SOP 23528.

**LIMITATION OF LIABILITIES**

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

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



### Certification Information

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

**Westborough Facility**

**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene  
**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene, SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene.  
**EPA 8270D:** NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.  
**SM1500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

**Mansfield Facility**

**SM 2540D:** TSS  
**EPA 8082A:** NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.  
**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.  
**EPA TO-12** Non-methane organics  
**EPA 3C** Fixed gases  
**Biological Tissue Matrix:** EPA 3050B

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

**Westborough Facility:**

**Drinking Water**

**EPA 300.6:** Chloride, Nitrate-N, Fluoride, Sulfate, **EPA 353.2:** Nitrate-N, Nitrite-N, **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**  
**EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.  
**Microbiology:** **SM9215B, SM9223-P/A, SM9223B-Colilert-QT,SM9222D.**

**Non-Potable Water**

**SM4500H.B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LCHAT 10-107-06-1-B.** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2.** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.  
**EPA 624.1** Volatile Halocarbons & Aromatics,  
**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs  
**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil  
**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

**Mansfield Facility:**

**Drinking Water**

**EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg, EPA 522.**

**Non-Potable Water**

**EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.  
**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.  
**EPA 245.1 Hg, SM2340B**

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



ANALYTICAL REPORT

|                 |  |
|-----------------|--|
| Lab Number:     | L2028495   |
| Client:         | Maryland Department of the Environment<br>1800 Washington Boulevard<br>Baltimore, MD 21230 |
| ATTN:           | Amy Laliberte  |
| Phone:          | (410) 537-3614   |
| Project Name:   | PFAS STUDY   |
| Project Number: | Not Specified  |
| Report Date:    | 07/20/20   |

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Certifications & Approvals: MA (M MA030), NH NELAP (2062), CT (PH 0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA0030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68 02089), RI (LA000299), TX (T104704419), VT (VT 0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330 17 00150), USFWS (Permit #206964).

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



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

| Alpha Sample ID | Client ID | Matrix | Sample Location | Collection Date/Time | Receive Date |
|-----------------|-----------|--------|-----------------|----------------------|--------------|
| L2028495-01     | FB-W1     | WATER  | Not Specified   | 07/07/20 10:02       | 07/07/20     |
| L2028495-02     | FB-7A     | WATER  | Not Specified   | 07/07/20 10:02       | 07/07/20     |
| L2028495-03     | TB002     | WATER  | Not Specified   | 07/07/20 06:57       | 07/07/20     |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

### Case Narrative

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

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

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

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

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

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

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**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

### Case Narrative (continued)

#### Perfluorinated Alkyl Acids by Isotope Dilution

L2028495-01 and -02: The MeOH fraction of the extraction is reported for the following compounds: N-Methyl Perfluorooctane Sulfonamide (NMeFOSA) and N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA) due to better extraction efficiency of the Surrogates (Extracted Internal Standards).

L2028495-01 and -02(MEOH): Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

L2028495-01 and -02: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

WG1391399-1 through -4(MEOH): Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

WG1391399-1 through -4: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

WG1391399-2/-3: The LCS/LCSD recoveries, associated with L2028495-01 and -02, are above the acceptance criteria for perfluorotridecanoic acid (pftnda) (196%/159%), perfluorohexadecanoic acid (pfxda) (396%/363%), 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9cl-pf3ons) (302%/297%), 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11cl-pf3ouds) (300%/302%), n-methyl perfluorooctanesulfonamido ethanol (nmefose) (386%/273%) and n-ethyl perfluorooctanesulfonamido ethanol (nefose) (266%/298%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

WG1391399-2/-3: The LCS/LCSD RPDs, associated with L2028495-01 and -02, are above the acceptance criteria for n-ethyl perfluorooctanesulfonamidoacetic acid (nefosaa) (51%) and n-methyl perfluorooctanesulfonamido ethanol (nmefose) (34%).

WG1391399-2/-3(MEOH): The LCS/LCSD recoveries, associated with L2028495-01 and -02, are above the acceptance criteria for n-methyl perfluorooctanesulfonamido ethanol (nmefose) (325%/392%) and n-ethyl perfluorooctanesulfonamido ethanol (nefose) (214% LCS only); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

WG1391399-2/-3(MEOH): The LCS/LCSD RPD, associated with L2028495-01 and -02, are above the

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

**Case Narrative (continued)**

acceptance criteria for n-ethyl perfluorooctanesulfonamido ethanol (netfose) (60%).

WG1391400-2/-3: The LCS/LCSD recovery, associated with L2028495-03, is above the acceptance criteria for perfluorotridecanoic acid (pfrda) (181%/162%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

WG1391400-2/-3: The LCS/LCSD RPD, associated with L2028495-03, is above the acceptance criteria for n-ethyl perfluorooctanesulfonamidoacetic acid (netfosaa) (37%).

WG1391399-4: The MeOH fraction of the extraction is reported for the following compounds: N-Methyl Perfluorooctane Sulfonamide (NMeFOSA) and N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA) due to better extraction efficiency of the Surrogates (Extracted Internal Standards).

WG1391399-4: The MS recoveries, performed on L2028495-01, are outside the acceptance criteria for n-ethyl perfluorooctanesulfonamidoacetic acid (netfosaa) (202%), perfluorotridecanoic acid (pfrda) (164%), 2,3,3,3-tetrafluoro-2-[1,1,2,2,3,3,3-heptafluoropropoxy]-propanoic acid (hfpo-da) (165%), perfluorohexadecanoic acid (pfhxda) (397%), 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9cl-pf3ons) (309%), 11-chloroicosadecafluoro-3-oxaundecane-1-sulfonic acid (11cl-pf3ouds) (301%), n-methyl perfluorooctanesulfonamido ethanol (nmefose) (230%) and n-ethyl perfluorooctanesulfonamido ethanol (netfose) (258%).

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

Authorized Signature:

 Alycia Mogayzel

Title: Technical Director/Representative

Date: 07/20/20



# ORGANICS





# SEMIVOLATILES



Serial\_No:07202017:33

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

**Lab ID:** L2028495-01  
**Client ID:** FB-W1  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 10:02  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/17/20 09:32  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 06:41

| Parameter  | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|--|--------|-----------|-------|------|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |      |     |                 |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                 | ND     |           | ng/l  | 18.4 | --  | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                  | ND     |           | ng/l  | 18.4 | --  | 1               |

| Surrogate (Extracted Internal Standard)                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA) | 8          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)  | 6          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

**Lab ID:** L2028495-01  
**Client ID:** FB-W1  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 10:02  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/17/20 23:21  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 06:41

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |      |     |                 |
| Perfluorobutanoic Acid (PFBA)   | 2.12   |           | ng/l  | 1.84 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 1.90   |           | ng/l  | 1.84 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 2.67   |           | ng/l  | 1.84 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                          | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/l  | 46.1 | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/l  | 3.69 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

**Lab ID:** L2028495-01  
**Client ID:** FB-W1  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 10:02  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/l  | 3.69 | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/l  | 1.84 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/l  | 4.61 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)         | ND     |           | ng/l  | 1.84 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/l  | 1.84 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/l  | 46.1 | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEFOSE)                   | ND     |           | ng/l  | 46.1 | -   | 1               |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 30         |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 31         |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 114        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 129        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 27         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 28         | Q         | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 105        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 27         | Q         | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 69         |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 27         | Q         | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 76         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 29         | Q         | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 52         |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 34         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 32         | Q         | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 19         |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 21         | Q         | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 27         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 27         | Q         | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 8          | Q         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 61         |           | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 19         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)                     | 10         | Q         | 50-150              |



Serial\_No:07202017:33

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028495  
Report Date: 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028495-02  
Client ID: FB-7A  
Sample Location: Not Specified

Date Collected: 07/07/20 10:02  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:  
Matrix: Water  
Analytical Method: 134,LCMSMS-ID  
Analytical Date: 07/17/20 10:05  
Analyst: RS

Extraction Method: ALPHA 23528  
Extraction Date: 07/13/20 06:41

| Parameter  | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|--|--------|-----------|-------|------|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |      |     |                 |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                 | ND     |           | ng/l  | 18.3 | --  | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                  | ND     |           | ng/l  | 18.3 | --  | 1               |

| Surrogate (Extracted Internal Standard)                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA) | 7          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)  | 5          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

**Lab ID:** L2028495-02  
**Client ID:** FB-7A  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 10:02  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/17/20 23:54  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 06:41

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |      |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                          | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)   | ND     |           | ng/l  | 1.83 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/l  | 45.7 | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/l  | 1.83 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/l  | 3.65 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

**Lab ID:** L2028495-02  
**Client ID:** FB-7A  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 10:02  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/l  | 3.65 | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/l  | 1.83 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/l  | 4.57 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)         | ND     |           | ng/l  | 1.83 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/l  | 1.83 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/l  | 45.7 | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEFOSE)                   | ND     |           | ng/l  | 45.7 | -   | 1               |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 53         |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 71         |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 122        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 63         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 59         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 52         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 103        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 47         |           | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 62         |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 39         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 79         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 43         |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 54         |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 28         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 36         | Q         | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 39         |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 14         | O         | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 21         | O         | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 21         | O         | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 15         | O         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 45         | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 23         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)                     | 8          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

**Lab ID:** L2028495-03  
**Client ID:** TB002  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 06:57  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 22:45  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 07:30

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.80 | --  | 1               |





Serial\_No:07202017:33

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

**SAMPLE RESULTS**

Lab ID: L2028495-03  
 Client ID: TB002  
 Sample Location: Not Specified

Date Collected: 07/07/20 06:57  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 136        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 68         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 101        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 96         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 105        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 85         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 76         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 89         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 78         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 53         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 75         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 59         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 62         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 33         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 07/17/20 08:42  
 Analyst: RS

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 06:41

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-02 Batch: WG1391399-1</b> |        |           |       |      |     |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | ND     |           | ng/l  | 20.0 | --  |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)   | ND     |           | ng/l  | 20.0 | --  |
| N-Methyl Perfluorooctanesulfonamide Ethanol (NMeFOSE)   | ND     |           | ng/l  | 50.0 | --  |
| N-Ethyl Perfluorooctanesulfonamide Ethanol (NEtFOSE)  | ND     |           | ng/l  | 50.0 | --  |

| Surrogate (Extracted Internal Standard)                               | %Recovery | Qualifier | Acceptance Criteria |
|---|-----------|-----------|---------------------|
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                             | 10        |           | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 8         | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                 | 7         | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 7         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)  | 6         | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

**Method Blank Analysis  
 Batch Quality Control**

**Analytical Method:** 134.LCMSMS-ID  
**Analytical Date:** 07/17/20 22:10  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 06:41

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-02 Batch: WG1391399-1</b> |        |           |       |      |     |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/l  | 2.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/l  | 2.00 | --  |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy] Propanoic Acid (HFPO-DA)                             | ND     |           | ng/l  | 50.0 | --  |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)   | ND     |           | ng/l  | 2.00 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

**Method Blank Analysis  
 Batch Quality Control**

**Analytical Method:** 134.LCMSMS-ID  
**Analytical Date:** 07/17/20 22:10  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 06:41

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-02 Batch: WG1391399-1</b> |        |           |       |      |     |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/l  | 4.00 | --  |
| Perfluorooctadecanoic Acid (PFODA)  | ND     |           | ng/l  | 4.00 | --  |
| Perfluorododecane Sulfonic Acid (PFDoDS)  | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)  | ND     |           | ng/l  | 5.00 | --  |
| 9-Chlorohexadecafluoro-3-Oxanon-1-Sulfonic Acid (9Cl-PF3ONS)  | ND     |           | ng/l  | 2.00 | --  |
| 11-Chloroicosafafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)   | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | ND     |           | ng/l  | 20.0 | --  |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | ND     |           | ng/l  | 20.0 | --  |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)   | ND     |           | ng/l  | 50.0 | --  |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEFOSE)   | ND     |           | ng/l  | 50.0 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 07/17/20 22:10  
 Analyst: RS

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 06:41

**Parameter** **Result** **Qualifier** **Units** **RL** **MDL**  
 Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-02 Batch: WG1391399-1

| Surrogate (Extracted Internal Standard)  | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 43        |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 60        |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 118       |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 63        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 53        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 49        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 100       |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 44        |           | 38-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 63        |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 42        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 84        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 46        |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 48        |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 26        |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 47        |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 59        |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 17        | Q         | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 38        |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 34        |           | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 13        | Q         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 86        |           | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 5         | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                                    | 4         | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 15        | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)                     | 9         | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 07/17/20 18:01  
 Analyst: RS

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 07:30

| Parameter  | Result | Qualifier | Units | RL   | MDL |
|--|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 03 Batch: WG1391400-1 R</b> |        |           |       |      |     |
| Perfluorobutanesulfonic Acid (PFBS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanoic Acid (PFHxA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanoic Acid (PFOA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanoic Acid (PFNA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDA)  | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)   | ND     |           | ng/l  | 2.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDoA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)   | ND     |           | ng/l  | 2.00 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 07/17/20 18:01  
 Analyst: RS

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 07:30

| Parameter   | Result | Qualifier | Units | RL | MDL |
|---|--------|-----------|-------|----|-----|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 03 Batch: WG1391400-1 R |        |           |       |    |     |

| Surrogate (Extracted Internal Standard)                                | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)                                   | 88        |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)                                | 110       |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 117       |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)         | 94        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 102       |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 94        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 101       |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 86        |           | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)         | 81        |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 83        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 87        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 81        |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)         | 83        |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 65        |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 85        |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                              | 38        |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 63        |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 70        |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 60        |           | 33-143              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028495  
Report Date: 07/20/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 Batch: WG1391399-2 WG1391399-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanoic Acid (PFBA)   | 111       |      | 107       |      | 67-148           | 4   |      | 30         |
| Perfluoropentanoic Acid (PFPeA)   | 113       |      | 109       |      | 63-181           | 4   |      | 30         |
| Perfluorobutanesulfonic Acid (PFBS)   | 112       |      | 108       |      | 65-157           | 4   |      | 30         |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | 122       |      | 110       |      | 37-219           | 10  |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 115       |      | 114       |      | 69-188           | 1   |      | 30         |
| Perfluoropentanesulfonic Acid (PFPS)  | 119       |      | 120       |      | 52-156           | 1   |      | 30         |
| Perfluorohexanoic Acid (PFHpA)  | 117       |      | 114       |      | 58-159           | 3   |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | 109       |      | 110       |      | 69-177           | 1   |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 123       |      | 117       |      | 63-159           | 5   |      | 30         |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (8:2FTS)   | 137       |      | 123       |      | 49-187           | 11  |      | 30         |
| Perfluorooheptanesulfonic Acid (PFHpS)  | 137       |      | 134       |      | 61-179           | 2   |      | 30         |
| Perfluorononanoic Acid (PFNA)   | 112       |      | 111       |      | 68-171           | 1   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 110       |      | 108       |      | 52-151           | 2   |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | 112       |      | 109       |      | 63-171           | 3   |      | 30         |
| 1H,1H,2H,2H-Perfluorodecane sulfonic Acid (8:2FTS)  | 123       |      | 141       |      | 56-173           | 14  |      | 30         |
| Perfluorononanesulfonic Acid (PFNS)   | 95        |      | 97        |      | 48-150           | 2   |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | 108       |      | 105       |      | 60-166           | 1   |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | 105       |      | 105       |      | 80-153           | 0   |      | 30         |
| Perfluorodecane sulfonic Acid (PFDS)  | 90        |      | 84        |      | 38-156           | 7   |      | 30         |
| Perfluorooctanesulfonamide (FOSA)   | 114       |      | 116       |      | 46-170           | 2   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | 85        |      | 143       |      | 45-170           | 51  | Q    | 30         |
| Perfluorododecanoic Acid (PFDoA)  | 145       |      | 108       |      | 67-153           | 29  |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028495  
Report Date: 07/20/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 Batch: WG1391399-2 WG1391399-3 |           |      |           |      |                  |     |      |            |
| Perfluorotridecanoic Acid (PFTrDA)  | 196       | Q    | 159       | O    | 48-158           | 21  |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | 158       |      | 181       |      | 58-182           | 15  |      | 30         |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Hexafluoropropoxy]-Propanoic Acid (HFPO-DA)  | 133       |      | 128       |      | 50-150           | 4   |      | 30         |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)   | 111       |      | 104       |      | 50-150           | 7   |      | 30         |
| Perfluorohexadecanoic Acid (PFHxDA)   | 306       | Q    | 363       | O    | 50-150           | 9   |      | 30         |
| Perfluorooctadecanoic Acid (PFODA)  | 74        |      | 57        |      | 50-150           | 26  |      | 30         |
| Perfluorododecane Sulfonic Acid (PFDS)  | 125       |      | 125       |      | 50-150           | 0   |      | 30         |
| 1H,1H,2H,2H-Perfluorododecane sulfonic Acid (10:2FTS)   | 131       |      | 117       |      | 50-150           | 11  |      | 30         |
| 9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)   | 302       | Q    | 297       | O    | 50-150           | 2   |      | 30         |
| 11-Chlorooctadecafluoro-3-Oxandecane-1-Sulfonic Acid (11Cl-PF3ONS)  | 300       | Q    | 302       | O    | 50-150           | 1   |      | 30         |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | 104       |      | 83        |      | 50-150           | 22  |      | 30         |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | 105       |      | 103       |      | 50-150           | 2   |      | 30         |
| N-Methyl Perfluorooctanesulfonamide Ethanol (NMeFOSE)   | 368       | Q    | 273       | O    | 50-150           | 34  | Q    | 30         |
| N-Ethyl Perfluorooctanesulfonamide Ethanol (NEFOSE)   | 266       | Q    | 296       | O    | 50-150           | 11  |      | 30         |





**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028495  
Report Date: 07/20/20

| Parameter   | LCS           |      | LCSD           |      | %Recovery Limits | RPD | Qual | RPD Limits          |
|---|---------------|------|----------------|------|------------------|-----|------|---------------------|
|   | %Recovery     | Qual | %Recovery      | Qual |                  |     |      |                     |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 Batch: WG1391399-2 WG1391399-3 |               |      |                |      |                  |     |      |                     |
| Surrogate (Extracted Internal Standard)   | LCS %Recovery | Qual | LCSD %Recovery | Qual |                  |     |      | Acceptance Criteria |
| Perfluoro[13C4]Butanoic Acid (MPFBA)  | 50            |      | 58             |      |                  |     |      | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)   | 64            |      | 75             |      |                  |     |      | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)   | 131           |      | 127            |      |                  |     |      | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-6:2FTS)  | 81            |      | 83             |      |                  |     |      | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)  | 56            |      | 66             |      |                  |     |      | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)   | 50            |      | 62             |      |                  |     |      | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)  | 113           |      | 107            |      |                  |     |      | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)   | 45            |      | 55             |      |                  |     |      | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-8:2FTS)  | 76            |      | 83             |      |                  |     |      | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)   | 40            |      | 50             |      |                  |     |      | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)   | 92            |      | 93             |      |                  |     |      | 42-148              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)   | 47            |      | 56             |      |                  |     |      | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)  | 61            |      | 64             |      |                  |     |      | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)  | 35            |      | 40             |      |                  |     |      | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)   | 43            |      | 48             |      |                  |     |      | 40-144              |
| Perfluoro[13C6]Octanesulfonamide (M6FOSA)   | 64            |      | 57             |      |                  |     |      | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)   | 30            |      | 26             |      |                  |     |      | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (M2PFDOA)  | 32            |      | 40             |      |                  |     |      | 24-181              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEA)   | 38            |      | 37             |      |                  |     |      | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)                                  | 19            | Q    | 25             | Q    |                  |     |      | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)   | 85            |      | 86             |      |                  |     |      | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)  | 8             | Q    | 2              | Q    |                  |     |      | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)   | 5             | Q    | 1              | Q    |                  |     |      | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)   | 42            | Q    | 57             |      |                  |     |      | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)  | 20            | Q    | 18             | Q    |                  |     |      | 50-150              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028495  
Report Date: 07/20/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 Batch: WG1391399-2 WG1391399-3 |           |      |           |      |                  |     |      |            |
| Perfluorooctanesulfonamide (FOSA)   | 104       |      | 89        |      | 46-170           | 25  |      | 30         |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | 122       |      | 100       |      | 50-150           | 4   |      | 30         |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | 103       |      | 104       |      | 50-150           | 1   |      | 30         |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)   | 325       | Q    | 322       | Q    | 50-150           | 2   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEIFOSE)  | 214       | Q    | 143       |      | 50-150           | 60  | Q    | 30         |

| Surrogate (Extracted Internal Standard)                               | LCS       |      | LCSD      |      | Acceptance Criteria |
|---|-----------|------|-----------|------|---------------------|
|   | %Recovery | Qual | %Recovery | Qual |                     |
| Perfluoro[13C6]Octanesulfonamide (M6FOSA)                             | 9         |      | 9         |      | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 7         | Q    | 6         | Q    | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                 | 6         | Q    | 5         | Q    | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 17        | Q    | 12        | Q    | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)  | 6         | Q    | 9         | Q    | 50-150              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028495  
Report Date: 07/20/20

| Parameter  | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|--|-----------|------|-----------|------|------------------|-----|------|------------|
|  | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 03 Batch: WG1391400-2 WG1391400-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)  | 111       |      | 108       |      | 65-157           | 3   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)   | 116       |      | 114       |      | 59-188           | 2   |      | 30         |
| Perfluorooctanoic Acid (PFHxA)   | 113       |      | 111       |      | 58-159           | 2   |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)   | 112       |      | 107       |      | 59-177           | 5   |      | 30         |
| Perfluorooctanoic Acid (PFOA)  | 122       |      | 115       |      | 63-159           | 6   |      | 30         |
| Perfluorononanoic Acid (PFNA)  | 109       |      | 112       |      | 68-171           | 3   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)  | 108       |      | 106       |      | 52-151           | 3   |      | 30         |
| Perfluorodecanoic Acid (PFDA)  | 119       |      | 110       |      | 63-171           | 8   |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)  | 103       |      | 119       |      | 80-186           | 14  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)   | 119       |      | 102       |      | 60-153           | 15  |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)   | 147       |      | 101       |      | 45-170           | 17  | Q    | 30         |
| Perfluorododecanoic Acid (PFDDA)   | 110       |      | 110       |      | 67-153           | 0   |      | 30         |
| Perfluorotridecanoic Acid (PFTDA)  | 111       | Q    | 162       | O    | 48-158           | 11  |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)   | 146       |      | 126       |      | 59-182           | 15  |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028495  
Report Date: 07/20/20

| Parameter  | LCS       |      | LCSD      |      | %Recovery Limits    | RPD | Qual | RPD Limits |
|--|-----------|------|-----------|------|---------------------|-----|------|------------|
|  | %Recovery | Qual | %Recovery | Qual |                     |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 03 Batch: WG1391400-2 WG1391400-3 |           |      |           |      |                     |     |      |            |
| Surrogate (Extracted Internal Standard)  | LCS       |      | LCSD      |      | Acceptance Criteria |     |      |            |
|  | %Recovery | Qual | %Recovery | Qual |                     |     |      |            |
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 85        |      | 85        |      |                     |     |      | 2-156      |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 107       |      | 108       |      |                     |     |      | 16-173     |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 122       |      | 122       |      |                     |     |      | 31-159     |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)   | 95        |      | 94        |      |                     |     |      | 1-313      |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 98        |      | 101       |      |                     |     |      | 21-145     |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 92        |      | 94        |      |                     |     |      | 30-139     |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)   | 101       |      | 104       |      |                     |     |      | 47-153     |
| Perfluoro[13C8]Octanoic Acid (M8PFDA)  | 83        |      | 86        |      |                     |     |      | 36-149     |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)   | 84        |      | 82        |      |                     |     |      | 1-244      |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 79        |      | 80        |      |                     |     |      | 34-146     |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 91        |      | 86        |      |                     |     |      | 42-146     |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 77        |      | 85        |      |                     |     |      | 38-144     |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)   | 77        |      | 87        |      |                     |     |      | 7-170      |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)   | 77        |      | 70        |      |                     |     |      | 1-181      |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)  | 74        |      | 72        |      |                     |     |      | 40-144     |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 85        |      | 87        |      |                     |     |      | 1-87       |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 47        |      | 59        |      |                     |     |      | 23-146     |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPDDA)   | 54        |      | 52        |      |                     |     |      | 24-181     |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 55        |      | 55        |      |                     |     |      | 33-143     |



**Matrix Spike Analysis**  
Batch Quality Control

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

| Parameter   | Native Sample | MS Added | MS Found | MS %Recovery | Qual | MSD Found | MSD %Recovery | Qual | Recovery Limits | RPD | Qual | RPD Limits |
|---|---------------|----------|----------|--------------|------|-----------|---------------|------|-----------------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1391399-4 QC Sample: L2028495-01 Client ID: FB-W1 |               |          |          |              |      |           |               |      |                 |     |      |            |
| Perfluorobutanoic Acid (PFBA)   | 2.12          | 38.5     | 44.0     | 109          |      | -         | -             |      | 67-148          | -   |      | 30         |
| Perfluoropentanoic Acid (PFPeA)   | ND            | 38.5     | 44.6     | 116          |      | -         | -             |      | 63-161          | -   |      | 30         |
| Perfluorobutanesulfonic Acid (PFBS)   | ND            | 34.1     | 39.7     | 116          |      | -         | -             |      | 65-157          | -   |      | 30         |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | ND            | 36       | 43.4     | 120          |      | -         | -             |      | 37-219          | -   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 1.90          | 38.5     | 46.8     | 117          |      | -         | -             |      | 69-168          | -   |      | 30         |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND            | 34.6     | 41.4     | 119          |      | -         | -             |      | 52-156          | -   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | ND            | 38.5     | 47.4     | 123          |      | -         | -             |      | 58-159          | -   |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND            | 35.1     | 41.4     | 118          |      | -         | -             |      | 69-177          | -   |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 2.67          | 38.5     | 51.8     | 127          |      | -         | -             |      | 63-159          | -   |      | 30         |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (8:2FTS)   | ND            | 36.8     | 51.7     | 141          |      | -         | -             |      | 49-187          | -   |      | 30         |
| Perfluorooheptanesulfonic Acid (PFHpS)  | ND            | 36.8     | 49.8     | 136          |      | -         | -             |      | 61-179          | -   |      | 30         |
| Perfluorononanoic Acid (PFNA)   | ND            | 38.5     | 44.9     | 117          |      | -         | -             |      | 66-171          | -   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | ND            | 35.8     | 40.8     | 114          |      | -         | -             |      | 52-151          | -   |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | ND            | 38.5     | 42.2     | 110          |      | -         | -             |      | 63-171          | -   |      | 30         |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)   | ND            | 37       | 36.8     | 100          |      | -         | -             |      | 56-173          | -   |      | 30         |
| Perfluorononanesulfonic Acid (PFNS)   | ND            | 37       | 33.1     | 90           |      | -         | -             |      | 48-150          | -   |      | 30         |
| N Methyl Perfluorooctanesulfonamideacetic Acid (NMeFOSAA)   | ND            | 38.5     | 50.6     | 131          |      | -         | -             |      | 60-166          | -   |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | ND            | 38.5     | 42.8     | 111          |      | -         | -             |      | 60-153          | -   |      | 30         |
| Perfluorodecanesulfonic Acid (PFDS)   | ND            | 37.2     | 31.4     | 84           |      | -         | -             |      | 38-156          | -   |      | 30         |
| Perfluorooctanesulfonamide (FOSA)   | ND            | 38.5     | 41.6F    | 108          |      | -         | -             |      | 46-170          | -   |      | 30         |
| N Ethyl Perfluorooctanesulfonamideacetic Acid (NEFOSAA)   | ND            | 38.5     | 77.8     | 202          | Q    | -         | -             |      | 45-170          | -   |      | 30         |
| Perfluorododecanoic Acid (PFDoA)  | ND            | 38.5     | 47.7     | 124          |      | -         | -             |      | 67-153          | -   |      | 30         |



**Matrix Spike Analysis**  
Batch Quality Control

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

| Parameter   | Native Sample | MS Added | MS Found | MS %Recovery | Qual | MSD Found | MSD %Recovery | Qual | Recovery Limits | RPD | Qual | RPD Limits |
|---|---------------|----------|----------|--------------|------|-----------|---------------|------|-----------------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1391399-4 QC Sample: L2028495-01 Client ID: FB-W1 |               |          |          |              |      |           |               |      |                 |     |      |            |
| Perfluorotridecanoic Acid (PFTDA)   | ND            | 38.5     | 63.0     | 164          | Q    | -         | -             |      | 48-158          | -   |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | ND            | 38.5     | 51.1     | 133          |      | -         | -             |      | 59-182          | -   |      | 30         |
| 2,3,3,3-Tetrafluoro-2-[1,1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-D4)   | ND            | 770      | 1270     | 165          | Q    | -         | -             |      | 50-150          | -   |      | 30         |
| 4,8-Dioxa-3H-Perfluorononanoic Acid (ADONA)   | ND            | 38.5     | 24.2     | 63           |      | -         | -             |      | 50-150          | -   |      | 30         |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND            | 38.5     | 153      | 397          | Q    | -         | -             |      | 50-150          | -   |      | 30         |
| Perfluorooctadecanoic Acid (PFODA)  | ND            | 38.5     | 36.8     | 96           |      | -         | -             |      | 50-150          | -   |      | 30         |
| Perfluorododecane Sulfonic Acid (PFDoDS)  | ND            | 37.3     | 41.7     | 112          |      | -         | -             |      | 50-150          | -   |      | 30         |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)  | ND            | 37.1     | 32.0     | 86           |      | -         | -             |      | 50-150          | -   |      | 30         |
| 9-Chlorohexadecafluoro-3-Oxanon-1-Sulfonic Acid (9Cl-PF3ONS)  | ND            | 35.9     | 111      | 309          | Q    | -         | -             |      | 50-150          | -   |      | 30         |
| 11-Chlorooctadecafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)  | ND            | 36.3     | 109      | 301          | Q    | -         | -             |      | 50-150          | -   |      | 30         |
| N Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | ND            | 385      | 509      | 132          |      | -         | -             |      | 50-150          | -   |      | 30         |
| N Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | ND            | 385      | 409      | 106          |      | -         | -             |      | 50-150          | -   |      | 30         |
| N Methyl Perfluorooctanesulfonamide Ethanol (NMeFOSE)   | ND            | 385      | 887      | 230          | Q    | -         | -             |      | 50-150          | -   |      | 30         |
| N Ethyl Perfluorooctanesulfonamide Ethanol (NEFOSE)   | ND            | 385      | 994E     | 258          | Q    | -         | -             |      | 50-150          | -   |      | 30         |

| Surrogate (Extracted Internal Standard)                        | MS         |           | MSD        |           | Acceptance Criteria |
|--|------------|-----------|------------|-----------|---------------------|
|  | % Recovery | Qualifier | % Recovery | Qualifier |                     |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS) | 63         |           |            |           | 7-170               |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS) | 126        |           |            |           | 1-313               |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS) | 72         |           |            |           | 1-244               |



**Matrix Spike Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028495  
Report Date: 07/20/20

| Parameter   | Native Sample | MS Added | MS Found | MS %Recovery | Qual | MSD Found | MSD %Recovery | Qual | Recovery Limits | RPD | Qual | RPD Limits |
|---|---------------|----------|----------|--------------|------|-----------|---------------|------|-----------------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1391399-4 QC Sample: L2028495-01 Client ID: FB-W1 |               |          |          |              |      |           |               |      |                 |     |      |            |

| Surrogate (Extracted Internal Standard)  | MS         |           | MSD        |           | Acceptance Criteria |
|--|------------|-----------|------------|-----------|---------------------|
|  | % Recovery | Qualifier | % Recovery | Qualifier |                     |
| 2,3,3,3-Tetrafluoro-2-[1,1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 8          | Q         |            |           | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEFOSE)                        | 3          | Q         |            |           | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                      | 10         | Q         |            |           | 50-150              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEFOSAA)                       | 16         | Q         |            |           | 23-146              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                     | 23         |           |            |           | 1-181               |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEFOSA)                                       | 7          | Q         |            |           | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                     | 7          | Q         |            |           | 50-150              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                    | 36         | Q         |            |           | 40-144              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 36         | Q         |            |           | 38-144              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 27         |           |            |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 26         | Q         |            |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)   | 102        |           |            |           | 47-153              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 30         |           |            |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 28         | Q         |            |           | 33-143              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 57         |           |            |           | 50-150              |
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 31         |           |            |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 34         |           |            |           | 16-173              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 6          |           |            |           | 1-87                |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 89         |           |            |           | 42-146              |
| Perfluoro[13C8]Octanoic Acid (M8FFOA)  | 28         | Q         |            |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 29         | Q         |            |           | 34-146              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 113        |           |            |           | 31-159              |

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Serial\_No:** 07202017.33  
**Lab Number:** L2028495  
**Report Date:** 07/20/20

**Sample Receipt and Container Information**

Were project specific reporting limits specified? YES

**Cooler Information**

**Cooler**                      **Custody Seal**  
A                                      Absent

**Container Information**

| <b>Container ID</b> | <b>Container Type</b>     | <b>Cooler</b> | <b>Initial pH</b> | <b>Final pH</b> | <b>Temp deg C</b> | <b>Pres</b> | <b>Seal</b> | <b>Frozen Date/Time</b> | <b>Analysis(*)</b>     |
|---------------------|---------------------------|---------------|-------------------|-----------------|-------------------|-------------|-------------|-------------------------|------------------------|
| L2028495-01A        | Plastic 250ml unpreserved | A             | NA                |                 | 2.5               | Y           | Absent      |                         | A2-537-ISOTOPE-36(14); |
| L2028495-01B        | Plastic 250ml unpreserved | A             | NA                |                 | 2.5               | Y           | Absent      |                         | A2-537-ISOTOPE-36(14); |
| L2028495-02A        | Plastic 250ml unpreserved | A             | NA                |                 | 2.5               | Y           | Absent      |                         | A2-537-ISOTOPE-36(14); |
| L2028495-03A        | Plastic 250ml unpreserved | A             | NA                |                 | 2.5               | Y           | Absent      |                         | A2-537-ISOTOPE(14)     |

\*Values in parentheses indicate holding time in days



Project Name: PFAS STUDY  
 Project Number:

Serial\_No:07202017:33  
 Lab Number: L2028495  
 Report Date: 07/20/20

**PFAS PARAMETER SUMMARY**

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



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

## GLOSSARY

### Acronyms

|                 |  |
|-----------------|--|
| <b>DL</b>       | - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  |
| <b>EDL</b>      | - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME)  |
| <b>EMPC</b>     | - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.   |
| <b>EPA</b>      | - Environmental Protection Agency.   |
| <b>LCS</b>      | - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.  |
| <b>LCSd</b>     | - Laboratory Control Sample Duplicate: Refer to LCS.   |
| <b>LIB</b>      | - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.   |
| <b>LOD</b>      | - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)   |
| <b>LOQ</b>      | - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)<br><br>Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) |
| <b>MDL</b>      | - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.  |
| <b>MS</b>       | - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 3320, the spike recovery is calculated using the native concentration, including estimated values.   |
| <b>MSD</b>      | - Matrix Spike Sample Duplicate: Refer to MS.  |
| <b>NA</b>       | - Not Applicable.  |
| <b>NC</b>       | - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.   |
| <b>NDPA/DPA</b> | - N-Nitrosodiphenylamine/Diphenylamine.  |
| <b>NI</b>       | - Not Identifiable.  |
| <b>NP</b>       | - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.  |
| <b>RI</b>       | - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RI includes any adjustments from dilutions, concentrations or moisture content, where applicable.   |
| <b>RPD</b>      | - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values, although the RPD value will be provided in the report.  |
| <b>SRM</b>      | - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.   |
| <b>STLP</b>     | - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.  |
| <b>TEF</b>      | - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.   |
| <b>TEQ</b>      | - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.  |
| <b>TIC</b>      | - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.  |

### Footnotes

Report Format: Data Usability Report



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

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

#### Terms

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1.8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

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

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

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 18 hours from sample collection, value will be reflected in **bold**.

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

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

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (S)' result is defined as the summation of results for: PFOA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

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

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

#### Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration. (DOD and NYSDEC Part 375 PFAS only.)
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP/CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration

Report Format: Data Usability Report





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

**Data Qualifiers**

Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only)

- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028495  
**Report Date:** 07/20/20

**REFERENCES**

- 134 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) using Isotope Dilution. Alpha SOP 23528.

**LIMITATION OF LIABILITIES**

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

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



### Certification Information

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

**Westborough Facility**

**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene  
**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene, SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene.  
**EPA 8270D:** NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.  
**SM1500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

**Mansfield Facility**

**SM 2540D:** TSS  
**EPA 8082A:** NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.  
**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.  
**EPA TO-12** Non-methane organics  
**EPA 3C** Fixed gases  
**Biological Tissue Matrix:** EPA 3050B

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

**Westborough Facility:**

**Drinking Water**

**EPA 300.6:** Chloride, Nitrate-N, Fluoride, Sulfate, **EPA 353.2:** Nitrate-N, Nitrite-N, **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**  
**EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.  
**Microbiology:** **SM9215B, SM9223-P/A, SM9223B-Colilert-QT,SM9222D.**

**Non-Potable Water**

**SM4500H.B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LCHAT 10-107-06-1-B.** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2.** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.  
**EPA 624.1** Volatile Halocarbons & Aromatics,  
**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs  
**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil  
**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

**Mansfield Facility:**

**Drinking Water**

**EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.  
**EPA 522.**

**Non-Potable Water**

**EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.  
**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.  
**EPA 245.1** Hg.  
**SM2340B**

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



ANALYTICAL REPORT

|                 |  |
|-----------------|--|
| Lab Number:     | L2028498   |
| Client:         | Maryland Department of the Environment<br>1800 Washington Boulevard<br>Baltimore, MD 21230 |
| ATTN:           | Amy Laliberte  |
| Phone:          | (410) 537-3614   |
| Project Name:   | PFAS STUDY   |
| Project Number: | Not Specified  |
| Report Date:    | 08/07/20   |

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Certifications & Approvals: MA (M MA030), NH NELAP (2062), CT (PH 0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA0030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68 02089), RI (LA000299), TX (T104704419), VT (VT 0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330 17 00150), USFWS (Permit #206964).

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



Project Name: PFAS STUDY  
 Project Number: Not Specified

Lab Number: L2028498  
 Report Date: 08/07/20

| Alpha Sample ID | Client ID | Matrix | Sample Location | Collection Date/Time | Receive Date |
|-----------------|-----------|--------|-----------------|----------------------|--------------|
| L2028498-01     | FB-1A     | WATER  | Not Specified   | 07/07/20 09:02       | 07/07/20     |
| L2028498-02     | T1-W1     | WATER  | Not Specified   | 07/07/20 09:02       | 07/07/20     |
| L2028498-03     | T1-W2     | WATER  | Not Specified   | 07/07/20 09:17       | 07/07/20     |
| L2028498-04     | T1-W2R    | WATER  | Not Specified   | 07/07/20 09:21       | 07/07/20     |
| L2028498-05     | T1-W3     | WATER  | Not Specified   | 07/07/20 09:27       | 07/07/20     |
| L2028498-06     | FB-3A     | WATER  | Not Specified   | 07/07/20 09:43       | 07/07/20     |
| L2028498-07     | T3-W4     | WATER  | Not Specified   | 07/07/20 09:43       | 07/07/20     |
| L2028498-08     | T3-W4R    | WATER  | Not Specified   | 07/07/20 09:57       | 07/07/20     |
| L2028498-09     | T3-W3     | WATER  | Not Specified   | 07/07/20 10:02       | 07/07/20     |
| L2028498-10     | TB003     | WATER  | Not Specified   | 07/07/20 06:00       | 07/07/20     |
| L2028498-11     | T3-W2     | WATER  | Not Specified   | 07/07/20 10:07       | 07/07/20     |
| L2028498-12     | T3-W1     | WATER  | Not Specified   | 07/07/20 10:13       | 07/07/20     |
| L2028498-13     | FB-8A     | WATER  | Not Specified   | 07/07/20 10:19       | 07/07/20     |
| L2028498-14     | WFDS-W4   | WATER  | Not Specified   | 07/07/20 10:19       | 07/07/20     |
| L2028498-15     | WFDS-W3   | WATER  | Not Specified   | 07/07/20 10:25       | 07/07/20     |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

### Case Narrative

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

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

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

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

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

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

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**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**Case Narrative (continued)**

**Perfluorinated Alkyl Acids by Isotope Dilution**

L2028498-06 and -12: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

L2028498-06: The MeOH fraction was not reported due to no improvement in extraction efficiency, however report displays QC association.

L2028498-12: The MeOH fraction of the extraction is reported for the following compounds:

Perfluorooctanesulfonamide (FOSA), N-Methyl Perfluorooctane Sulfonamide (NMeFOSA), N-Ethyl Perfluorooctane Sulfonamide (NEFOSA), N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE), and N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE) due to better extraction efficiency of the Surrogates (Extracted Internal Standards).

L2028498-12(MEOH): Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

WG1391399-1, WG1391399-2, and WG1391399-3(MEOH): Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

WG1391399-1, WG1391399-2, and WG1391399-3: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

WG1391399-2/-3: The LCS/LCSD recoveries, associated with L2028498-06 and -12, are above the acceptance criteria for perfluorotridecanoic acid (pftdda) (196%/159%), perfluorohexadecanoic acid (pfxda) (395%/363%), 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9cl-pf3ons) (302%/297%), 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11cl-pf3ouds) (300%/302%), n-methyl perfluorooctanesulfonamido ethanol (nmefose) (386%/273%) and n-ethyl perfluorooctanesulfonamido ethanol (nefose) (266%/298); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

WG1391399-2/-3: The LCS/LCSD RPDs, associated with L2028498-06 and -12, are above the acceptance criteria for n-ethyl perfluorooctanesulfonamidoacetic acid (nefosaa) (51%) and n-methyl perfluorooctanesulfonamido ethanol (nmefose) (34%).

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**Case Narrative (continued)**

WG1391399-2(MEOH): The LCS/LCSD recoveries, associated with L2028498-12, are above the acceptance criteria for n-methyl perfluorooctanesulfonamido ethanol (nmefose) (325%/392%) and n-ethyl perfluorooctanesulfonamido ethanol (nefose) (214% LCSD only); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

WG1391399-2/-3(MEOH): The LCS/LCSD RPD, associated with L2028498-12, is above the acceptance criteria for n-ethyl perfluorooctanesulfonamido ethanol (nefose) (60%).

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

Authorized Signature:

 Alycia Mogayzel

Title: Technical Director/Representative

Date: 08/07/20



# ORGANICS



# SEMIVOLATILES



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

**Lab ID:** L2028498-01  
**Client ID:** FB-IA  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:02  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 13:34  
**Analyst:** JW

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 13:08

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.84 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.84 | --  | 1               |



Serial\_No:08072015:17

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028498  
Report Date: 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-01  
Client ID: FB-IA  
Sample Location: Not Specified

Date Collected: 07/07/20 09:02  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 79         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 55         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 72         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 77         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 84         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 76         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 73         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 78         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 75         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 62         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 87         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 64         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 82         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 49         |           | 33-143              |



Serial\_No:08072015:17

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028498  
Report Date: 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-02  
Client ID: T1-W1  
Sample Location: Not Specified

Date Collected: 07/07/20 09:02  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:  
Matrix: Water  
Analytical Method: 134,LCMSMS-ID  
Analytical Date: 07/16/20 13:51  
Analyst: JW

Extraction Method: ALPHA 23528  
Extraction Date: 07/13/20 13:08

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.37   |           | ng/l  | 1.82 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 2.21   |           | ng/l  | 1.82 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 5.17   |           | ng/l  | 1.82 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.82 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.82 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.82 | --  | 1               |



Serial\_No:08072015:17

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028498  
Report Date: 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-02  
Client ID: T1-W1  
Sample Location: Not Specified

Date Collected: 07/07/20 09:02  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 75         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 82         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 67         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 75         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 82         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 71         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 66         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 71         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 69         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 53         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 75         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 49         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 66         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 53         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

**Lab ID:** L2028498-03  
**Client ID:** T1-W2  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:17  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 14:24  
**Analyst:** JW

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 13:08

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.48   |           | ng/l  | 1.86 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 2.10   |           | ng/l  | 1.86 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 2.17   |           | ng/l  | 1.86 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.86 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.86 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.86 | --  | 1               |



Serial\_No:08072015:17

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

**Lab ID:** L2028498-03  
**Client ID:** T1-W2  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:17  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 77         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 72         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 67         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 76         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 83         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 72         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 65         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 65         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 61         |           | 58-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 35         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 65         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 45         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 60         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 47         |           | 33-143              |





Serial\_No:08072015:17

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028498  
Report Date: 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-04  
Client ID: T1-W2R  
Sample Location: Not Specified

Date Collected: 07/07/20 09:21  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:  
Matrix: Water  
Analytical Method: 134,LCMSMS-ID  
Analytical Date: 07/16/20 14:57  
Analyst: JW

Extraction Method: ALPHA 23528  
Extraction Date: 07/13/20 13:08

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.36   |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 2.00   |           | ng/l  | 1.80 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 1.94   |           | ng/l  | 1.80 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.80 | --  | 1               |



Serial\_No:08072015:17

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-04  
 Client ID: T1-W2R  
 Sample Location: Not Specified

Date Collected: 07/07/20 09:21  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 76         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 70         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 65         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 74         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 83         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 72         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 65         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 69         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 63         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 41         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 67         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 49         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 62         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 49         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-05  
 Client ID: T1-W3  
 Sample Location: Not Specified

Date Collected: 07/07/20 09:27  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:  
 Matrix: Water  
 Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 07/16/20 15:13  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 13:08

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.41   |           | ng/l  | 1.81 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 1.94   |           | ng/l  | 1.81 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 1.93   |           | ng/l  | 1.81 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.81 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.81 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.81 | --  | 1               |



Serial\_No:08072015:17

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-05  
 Client ID: T1-W3  
 Sample Location: Not Specified

Date Collected: 07/07/20 09:27  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 73         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 69         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 62         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 72         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 78         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 67         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 63         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 64         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 57         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 33         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 62         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 39         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 59         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 49         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

**Lab ID:** L2028498-06  
**Client ID:** FB-3A  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:43  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/18/20 01:01  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 06:41

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |      |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                          | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/l  | 45.0 | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/l  | 3.60 | --  | 1               |



Serial\_No:08072015:17

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028498  
Report Date: 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-06  
Client ID: FB-3A  
Sample Location: Not Specified

Date Collected: 07/07/20 09:43  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/l  | 3.60 | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/l  | 1.80 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/l  | 4.50 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)         | ND     |           | ng/l  | 1.80 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/l  | 18.0 | -   | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)                          | ND     |           | ng/l  | 18.0 | -   | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/l  | 45.0 | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEFOSE)                   | ND     |           | ng/l  | 45.0 | -   | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

**Lab ID:** L2028498-06  
**Client ID:** FB-3A  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:43  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 56         |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 77         |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 128        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                             | 70         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 64         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 57         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)   | 115        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 48         |           | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                             | 63         |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 42         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 89         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 44         |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                             | 44         |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                     | 30         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                   | 41         |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 53         |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                      | 19         | Q         | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 28         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 17         | Q         | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 16         | Q         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 44         | Q         | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                     | 11         | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                      | 8          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                      | 41         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                       | 14         | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

**Lab ID:** L2028498-07  
**Client ID:** T3-W4  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:43  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 15:30  
**Analyst:** JW

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 13:08

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.47   |           | ng/l  | 1.81 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 2.01   |           | ng/l  | 1.81 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 2.50   |           | ng/l  | 1.81 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.81 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.81 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.81 | --  | 1               |





Serial\_No:08072015:17

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-07  
 Client ID: T3-W4  
 Sample Location: Not Specified

Date Collected: 07/07/20 09:43  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 74         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 66         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 65         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 75         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 82         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 73         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 66         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 68         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 66         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 39         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 70         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 45         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 68         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 51         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

**Lab ID:** L2028498-08  
**Client ID:** T3-W4R  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:57  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 15:47  
**Analyst:** JW

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 13:08

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.58   |           | ng/l  | 1.82 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 2.03   |           | ng/l  | 1.82 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 3.87   |           | ng/l  | 1.82 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.82 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.82 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.82 | --  | 1               |



Serial\_No:08072015:17

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-08  
 Client ID: T3-W4R  
 Sample Location: Not Specified

Date Collected: 07/07/20 09:57  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 78         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 70         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 61         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 70         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 84         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 67         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 66         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 68         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 65         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 37         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 73         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 43         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 67         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 54         |           | 33-143              |



Serial\_No:08072015:17

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028498  
Report Date: 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-09  
Client ID: T3-W3  
Sample Location: Not Specified

Date Collected: 07/07/20 10:02  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:  
Matrix: Water  
Analytical Method: 134,LCMSMS-ID  
Analytical Date: 07/16/20 16:03  
Analyst: JW

Extraction Method: ALPHA 23528  
Extraction Date: 07/13/20 13:08

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.46   |           | ng/l  | 1.78 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 1.83   |           | ng/l  | 1.78 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 2.91   |           | ng/l  | 1.78 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.78 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.78 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.78 | --  | 1               |



Serial\_No:08072015:17

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-09  
 Client ID: T3-W3  
 Sample Location: Not Specified

Date Collected: 07/07/20 10:02  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 77         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 74         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 59         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 70         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 84         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 70         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 67         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 73         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 68         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 45         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 73         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 45         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 67         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 52         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

**Lab ID:** L2028498-10  
**Client ID:** TB003  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 06:00  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 16:36  
**Analyst:** JW

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 13:08

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.82 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.82 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.82 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.82 | --  | 1               |



Serial\_No:08072015:17

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028498  
Report Date: 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-10  
Client ID: TB003  
Sample Location: Not Specified

Date Collected: 07/07/20 06:00  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 85         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 45         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 71         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 76         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 85         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 75         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 73         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 74         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 70         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 55         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 79         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 52         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 72         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEdA)                       | 38         |           | 33-143              |



Serial\_No:08072015:17

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028498  
Report Date: 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-11  
Client ID: T3-W2  
Sample Location: Not Specified

Date Collected: 07/07/20 10:07  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:  
Matrix: Water  
Analytical Method: 134,LCMSMS-ID  
Analytical Date: 07/16/20 16:53  
Analyst: JW

Extraction Method: ALPHA 23528  
Extraction Date: 07/13/20 13:08

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.59   |           | ng/l  | 1.79 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | 2.10   |           | ng/l  | 1.79 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 2.04   |           | ng/l  | 1.79 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 6.72   |           | ng/l  | 1.79 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.79 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.79 | --  | 1               |





Serial\_No:08072015:17

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-11  
 Client ID: T3-W2  
 Sample Location: Not Specified

Date Collected: 07/07/20 10:07  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 76         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 76         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 62         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 69         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 81         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 68         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 66         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 69         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 63         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 34         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 67         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 38         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 62         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 49         |           | 33-143              |



Serial\_No:08072015:17

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-12  
 Client ID: T3-W1  
 Sample Location: Not Specified

Date Collected: 07/07/20 10:13  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:  
 Matrix: Water  
 Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 07/17/20 11:28  
 Analyst: RS

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 06:41

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorooctanesulfonamide (FOSA)                                     | ND     |           | ng/l  | 1.79 | --  | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/l  | 17.9 | --  | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/l  | 17.9 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/l  | 44.8 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/l  | 44.8 | --  | 1               |

| Surrogate (Extracted Internal Standard)                               | % Recovery | Qualifier | Acceptance Criteria |
|---|------------|-----------|---------------------|
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                             | 8          |           | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 8          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                 | 7          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 9          | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)  | 4          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

**Lab ID:** L2028498-12  
**Client ID:** T3-W1  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 10:13  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/18/20 01:17  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 06:41

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>                 |        |           |       |      |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                     | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 1.99   |           | ng/l  | 1.79 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                     | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | 2.43   |           | ng/l  | 1.79 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                     | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                             | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)                               | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/l  | 1.79 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,1,2,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/l  | 44.8 | --  | 1               |
| 4,8-Dioxo-3h-Perfluorononanoic Acid (ADONA)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/l  | 3.58 | --  | 1               |
| Perfluorooctadecanoic Acid (PFODA)  | ND     |           | ng/l  | 3.58 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

**Lab ID:** L2028498-12  
**Client ID:** T3-W1  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 10:13  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/l  | 1.79 | -   | 1               |
| 1H,1H,2H,2H Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/l  | 4.48 | -   | 1               |
| 9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)         | ND     |           | ng/l  | 1.79 | -   | 1               |
| 11-Chloroicosafafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUDS)   | ND     |           | ng/l  | 1.79 | -   | 1               |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 21         |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 22         |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 111        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2,4:2FTS)                           | 113        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 17         | Q         | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 17         | Q         | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 101        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 18         | Q         | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 67         |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 18         | Q         | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 79         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 24         | Q         | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 44         |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 27         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 26         | Q         | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 9          | Q         | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 21         | Q         | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 21         | Q         | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 5          | Q         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 60         |           | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

**Lab ID:** L2028498-13  
**Client ID:** FB-8A  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 10:19  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 17:09  
**Analyst:** JW

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 13:08

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.86 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.86 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.86 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.86 | --  | 1               |



Serial\_No:08072015:17

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028498  
Report Date: 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-13  
Client ID: FB-8A  
Sample Location: Not Specified

Date Collected: 07/07/20 10:19  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 78         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 45         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 67         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 74         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 83         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 74         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 73         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 74         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 71         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 51         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 79         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 48         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 75         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 38         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

**Lab ID:** L2028498-14  
**Client ID:** WFDS-W4  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 10:19  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 17:26  
**Analyst:** JW

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 13:08

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.40   |           | ng/l  | 1.85 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 2.03   |           | ng/l  | 1.85 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 3.23   |           | ng/l  | 1.85 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.85 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.85 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.85 | --  | 1               |



Serial\_No:08072015:17

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-14  
 Client ID: WFDS-W4  
 Sample Location: Not Specified

Date Collected: 07/07/20 10:19  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 74         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 71         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 61         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 70         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 83         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 69         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 67         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 75         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 69         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 41         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 74         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 44         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 73         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 55         |           | 33-143              |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-15  
 Client ID: WFDS-W3  
 Sample Location: Not Specified

Date Collected: 07/07/20 10:25  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:  
 Matrix: Water  
 Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 07/16/20 17:43  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 13:08

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.98   |           | ng/l  | 1.85 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | 2.26   |           | ng/l  | 1.85 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 2.51   |           | ng/l  | 1.85 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 5.42   |           | ng/l  | 1.85 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.85 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.85 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.85 | --  | 1               |



Serial\_No:08072015:17

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028498  
Report Date: 08/07/20

**SAMPLE RESULTS**

Lab ID: L2028498-15  
Client ID: WFDS-W3  
Sample Location: Not Specified

Date Collected: 07/07/20 10:25  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 76         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 77         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 58         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 69         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 82         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 68         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 65         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 71         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 65         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 47         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 69         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 42         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 68         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 50         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 07/17/20 08:42  
 Analyst: RS

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 06:41

| Parameter  | Result | Qualifier | Units | RL   | MDL |
|--|--------|-----------|-------|------|-----|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 06,12 Batch: WG1391399-1 |        |           |       |      |     |
| Perfluorooctanesulfonamide (FOSA)  | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)   | ND     |           | ng/l  | 20.0 | --  |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)  | ND     |           | ng/l  | 20.0 | --  |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)  | ND     |           | ng/l  | 50.0 | --  |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)   | ND     |           | ng/l  | 50.0 | --  |

| Surrogate (Extracted Internal Standard)                               | %Recovery | Qualifier | Acceptance Criteria |
|---|-----------|-----------|---------------------|
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                             | 10        |           | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 8         | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                 | 7         | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 7         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)  | 6         | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**Method Blank Analysis**  
**Batch Quality Control**

**Analytical Method:** 134.LCMSMS-ID  
**Analytical Date:** 07/17/20 22:10  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 06:41

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 06,12 Batch: WG1391399-1</b> |        |           |       |      |     |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/l  | 2.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/l  | 2.00 | --  |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy] Propanoic Acid (HFPO-DA)                             | ND     |           | ng/l  | 50.0 | --  |
| 4,8-Dioxo-3h-Perfluorononanoic Acid (ADONA)   | ND     |           | ng/l  | 2.00 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 07/17/20 22:10  
 Analyst: RS

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 06:41

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 06,12 Batch: WG1391399-1</b> |        |           |       |      |     |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/l  | 4.00 | --  |
| Perfluorooctadecanoic Acid (PFODA)  | ND     |           | ng/l  | 4.00 | --  |
| Perfluorododecane Sulfonic Acid (PFDoDS)  | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)  | ND     |           | ng/l  | 5.00 | --  |
| 9-Chlorohexadecafluoro-3-Oxanon-1-Sulfonic Acid (9Cl-PF3ONS)  | ND     |           | ng/l  | 2.00 | --  |
| 11-Chloroicosafafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)   | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | ND     |           | ng/l  | 20.0 | --  |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | ND     |           | ng/l  | 20.0 | --  |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)   | ND     |           | ng/l  | 50.0 | --  |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEFOSE)   | ND     |           | ng/l  | 50.0 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**Method Blank Analysis  
 Batch Quality Control**

**Analytical Method:** 134.LCMSMS-ID  
**Analytical Date:** 07/17/20 22:10  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 06:41

**Parameter** **Result** **Qualifier** **Units** **RL** **MDL**  
 Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 06,12 Batch: WG1391399-1

| Surrogate (Extracted Internal Standard)  | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 43        |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 60        |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 118       |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 63        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 53        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 49        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 100       |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 44        |           | 38-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 63        |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 42        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 84        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 46        |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 48        |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 26        |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 47        |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 59        |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 17        | Q         | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 38        |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 34        |           | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 13        | Q         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 86        |           | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 5         | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                                    | 4         | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 15        | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)                     | 9         | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 07/16/20 12:28  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 13:08

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-05,07-11,13-15 Batch: WG1391540-1</b> |        |           |       |      |     |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/l  | 2.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/l  | 2.00 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 07/16/20 12:28  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 13:08

| Parameter  | Result | Qualifier | Units | RL | MDL |
|--|--------|-----------|-------|----|-----|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-05,07-11,13-15 Batch: WG1391540-1 |        |           |       |    |     |

| Surrogate (Extracted Internal Standard)                                | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)                                   | 75        |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)                                | 71        |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 81        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)         | 53        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 69        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 75        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 85        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 72        |           | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-8:2FTS)         | 60        |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 67        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 75        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 72        |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)         | 58        |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 53        |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLDA)                | 82        |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                              | 25        |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 58        |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 75        |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 60        |           | 33-143              |





**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028498  
Report Date: 08/07/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 06,12 Batch: WG1391399-2 WG1391399-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanoic Acid (PFBA)   | 111       |      | 107       |      | 67-148           | 4   |      | 30         |
| Perfluoropentanoic Acid (PFPeA)   | 113       |      | 109       |      | 63-181           | 4   |      | 30         |
| Perfluorobutanesulfonic Acid (PFBS)   | 112       |      | 108       |      | 65-157           | 4   |      | 30         |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | 122       |      | 110       |      | 37-219           | 10  |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 115       |      | 114       |      | 69-188           | 1   |      | 30         |
| Perfluoropentanesulfonic Acid (PFPeS)   | 119       |      | 120       |      | 52-156           | 1   |      | 30         |
| Perfluorohexanoic Acid (PFHpA)  | 117       |      | 114       |      | 58-159           | 3   |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | 109       |      | 110       |      | 69-177           | 1   |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 123       |      | 117       |      | 63-159           | 5   |      | 30         |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (8:2FTS)   | 137       |      | 123       |      | 49-187           | 11  |      | 30         |
| Perfluorooheptanesulfonic Acid (PFHpS)  | 137       |      | 134       |      | 61-179           | 2   |      | 30         |
| Perfluorononanoic Acid (PFNA)   | 112       |      | 111       |      | 68-171           | 1   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 110       |      | 108       |      | 52-151           | 2   |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | 112       |      | 109       |      | 63-171           | 3   |      | 30         |
| 1H,1H,2H,2H-Perfluorodecane sulfonic Acid (8:2FTS)  | 123       |      | 141       |      | 56-173           | 14  |      | 30         |
| Perfluorononanesulfonic Acid (PFNS)   | 95        |      | 97        |      | 48-150           | 2   |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | 108       |      | 105       |      | 60-166           | 1   |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | 105       |      | 105       |      | 80-153           | 0   |      | 30         |
| Perfluorodecane sulfonic Acid (PFDS)  | 90        |      | 84        |      | 38-156           | 7   |      | 30         |
| Perfluorooctanesulfonamide (FOSA)   | 114       |      | 116       |      | 46-170           | 2   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | 85        |      | 143       |      | 45-170           | 51  | Q    | 30         |
| Perfluorododecanoic Acid (PFDoA)  | 145       |      | 108       |      | 67-153           | 29  |      | 30         |

Page 46 of 80



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028498  
Report Date: 08/07/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 06,12 Batch: WG1391399-2 WG1391399-3 |           |      |           |      |                  |     |      |            |
| Perfluorotridecanoic Acid (PFTriDA)   | 196       | Q    | 159       | O    | 48-158           | 21  |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | 158       |      | 181       |      | 58-182           | 15  |      | 30         |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Hexafluoroisopropoxy]-Propanoic Acid (HFPO-DA)                                       | 133       |      | 128       |      | 50-150           | 4   |      | 30         |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)   | 111       |      | 104       |      | 50-150           | 7   |      | 30         |
| Perfluorohexadecanoic Acid (PFHxDA)   | 306       | Q    | 363       | O    | 50-150           | 9   |      | 30         |
| Perfluorooctadecanoic Acid (PFODA)  | 74        |      | 57        |      | 50-150           | 26  |      | 30         |
| Perfluorododecane Sulfonic Acid (PFDS)  | 125       |      | 125       |      | 50-150           | 0   |      | 30         |
| 1H,1H,2H,2H-Perfluorododecane sulfonic Acid (10:2FTS)   | 131       |      | 117       |      | 50-150           | 11  |      | 30         |
| 9-Chlorohexadecafluoro-3-Oxanon-1-Sulfonic Acid (9Cl-PF3ONS)  | 302       | Q    | 297       | O    | 50-150           | 2   |      | 30         |
| 11-Chlorooctadecafluoro-3-Oxandecane-1-Sulfonic Acid (11Cl-PF3ONS)  | 300       | Q    | 302       | O    | 50-150           | 1   |      | 30         |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | 104       |      | 83        |      | 50-150           | 22  |      | 30         |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | 105       |      | 103       |      | 50-150           | 2   |      | 30         |
| N-Methyl Perfluorooctanesulfonamide Ethanol (NMeFOSE)   | 368       | Q    | 273       | O    | 50-150           | 34  | Q    | 30         |
| N-Ethyl Perfluorooctanesulfonamide Ethanol (NEFOSE)   | 266       | Q    | 296       | O    | 50-150           | 11  |      | 30         |

Page 47 of 80



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028498  
Report Date: 08/07/20

| Parameter   | LCS           |      | LCSD           |      | %Recovery Limits | RPD | Qual | RPD Limits          |
|---|---------------|------|----------------|------|------------------|-----|------|---------------------|
|   | %Recovery     | Qual | %Recovery      | Qual |                  |     |      |                     |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 06,12 Batch: WG1391399-2 WG1391399-3 |               |      |                |      |                  |     |      |                     |
| Surrogate (Extracted Internal Standard)   | LCS %Recovery | Qual | LCSD %Recovery | Qual |                  |     |      | Acceptance Criteria |
| Perfluoro[13C4]Butanoic Acid (MPFBA)  | 50            |      | 58             |      |                  |     |      | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)   | 64            |      | 75             |      |                  |     |      | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)   | 131           |      | 127            |      |                  |     |      | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)  | 81            |      | 83             |      |                  |     |      | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)  | 56            |      | 66             |      |                  |     |      | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)   | 50            |      | 62             |      |                  |     |      | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)  | 113           |      | 107            |      |                  |     |      | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)   | 45            |      | 55             |      |                  |     |      | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)  | 76            |      | 83             |      |                  |     |      | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)   | 40            |      | 50             |      |                  |     |      | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)   | 92            |      | 93             |      |                  |     |      | 42-148              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)   | 47            |      | 56             |      |                  |     |      | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)  | 61            |      | 64             |      |                  |     |      | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)  | 35            |      | 40             |      |                  |     |      | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUUA)   | 43            |      | 48             |      |                  |     |      | 40-144              |
| Perfluoro[13C6]Octanesulfonamide (M6FOSA)   | 64            |      | 57             |      |                  |     |      | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)   | 30            |      | 26             |      |                  |     |      | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (M2PFDOA)  | 32            |      | 40             |      |                  |     |      | 24-181              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEA)   | 38            |      | 37             |      |                  |     |      | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)                                  | 19            | Q    | 25             | Q    |                  |     |      | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)   | 85            |      | 86             |      |                  |     |      | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)  | 8             | Q    | 2              | Q    |                  |     |      | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)   | 5             | Q    | 1              | Q    |                  |     |      | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)   | 42            | Q    | 57             |      |                  |     |      | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)  | 20            | Q    | 18             | Q    |                  |     |      | 50-150              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028498  
Report Date: 08/07/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 06,12 Batch: WG1391399-2 WG1391399-3 |           |      |           |      |                  |     |      |            |
| Perfluorooctanesulfonamide (FOSA)   | 104       |      | 89        |      | 46-170           | 25  |      | 30         |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | 122       |      | 100       |      | 50-150           | 4   |      | 30         |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | 103       |      | 104       |      | 50-150           | 1   |      | 30         |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)   | 325       | Q    | 322       | Q    | 50-150           | 2   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEIFOSE)  | 214       | Q    | 143       |      | 50-150           | 60  | Q    | 30         |

| Surrogate (Extracted Internal Standard)                               | LCS %Recovery | Qual | LCSD %Recovery | Qual |  | Acceptance Criteria |
|---|---------------|------|----------------|------|--|---------------------|
| Perfluoro[13C6]Octanesulfonamide (M6FOSA)                             | 9             |      | 9              |      |  | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 7             | Q    | 6              | Q    |  | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                 | 6             | Q    | 5              | Q    |  | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 17            | Q    | 12             | Q    |  | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)  | 6             | Q    | 9              | Q    |  | 50-150              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028498  
Report Date: 08/07/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-05,07-11,13-15 Batch: WG1391540-2 WG1391540-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)   | 126       |      | 137       |      | 65-157           | 8   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 126       |      | 139       |      | 59-188           | 10  |      | 30         |
| Perfluorooheptanoic Acid (PFHpA)  | 118       |      | 130       |      | 58-159           | 10  |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | 116       |      | 133       |      | 59-177           | 14  |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 125       |      | 136       |      | 63-159           | 8   |      | 30         |
| Perfluorononanoic Acid (PFNA)   | 122       |      | 134       |      | 68-171           | 9   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 127       |      | 129       |      | 52-151           | 2   |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | 122       |      | 127       |      | 63-171           | 4   |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | 114       |      | 128       |      | 80-186           | 12  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | 124       |      | 134       |      | 60-153           | 8   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)  | 127       |      | 136       |      | 45-170           | 7   |      | 30         |
| Perfluorododecanoic Acid (PFDDA)  | 127       |      | 133       |      | 67-153           | 5   |      | 30         |
| Perfluorotridecanoic Acid (PFTDA)   | 119       |      | 122       |      | 48-158           | 2   |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | 122       |      | 131       |      | 59-182           | 7   |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028498  
Report Date: 08/07/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits    | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|---------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                     |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-05,07-11,13-15 Batch: WG1391540-2 WG1391540-3 |           |      |           |      |                     |     |      |            |
| Surrogate (Extracted Internal Standard)   | LCS       |      | LCSD      |      | Acceptance Criteria |     |      |            |
|   | %Recovery | Qual | %Recovery | Qual |                     |     |      |            |
| Perfluoro[13C4]Butanoic Acid (MPFBA)  | 78        |      | 73        |      |                     |     |      | 2-156      |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)   | 74        |      | 70        |      |                     |     |      | 16-173     |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)   | 83        |      | 80        |      |                     |     |      | 31-159     |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)  | 59        |      | 55        |      |                     |     |      | 1-313      |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)  | 72        |      | 66        |      |                     |     |      | 21-145     |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)   | 81        |      | 73        |      |                     |     |      | 30-139     |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)  | 88        |      | 82        |      |                     |     |      | 47-153     |
| Perfluoro[13C8]Octanoic Acid (M8PFDA)   | 76        |      | 71        |      |                     |     |      | 36-149     |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)  | 67        |      | 65        |      |                     |     |      | 1-244      |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)   | 74        |      | 69        |      |                     |     |      | 34-146     |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)   | 76        |      | 78        |      |                     |     |      | 42-146     |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)   | 76        |      | 74        |      |                     |     |      | 38-144     |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)  | 63        |      | 65        |      |                     |     |      | 7-170      |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)  | 66        |      | 58        |      |                     |     |      | 1-181      |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)   | 84        |      | 79        |      |                     |     |      | 40-144     |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)   | 33        |      | 38        |      |                     |     |      | 1-87       |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)   | 62        |      | 55        |      |                     |     |      | 23-145     |
| Perfluoro[1,2-13C2]Dodecanoic Acid (M2PFDDA)  | 82        |      | 77        |      |                     |     |      | 24-181     |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)  | 65        |      | 62        |      |                     |     |      | 33-143     |



**Matrix Spike Analysis**  
Batch Quality Control

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

| Parameter  | Native Sample | MS Added | MS Found | MS %Recovery | Qual | MSD Found | MSD %Recovery | Qual | Recovery Limits | RPD | Qual | RPD Limits |
|--|---------------|----------|----------|--------------|------|-----------|---------------|------|-----------------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-05,07-11,13-15 QC Batch ID: WG1391540-4 QC Sample: L2028498-02<br>Client ID: T1-W1 |               |          |          |              |      |           |               |      |                 |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)  | ND            | 33.9     | 43.1     | 127          | -    | -         | -             | -    | 65-157          | -   | -    | 30         |
| Perfluorohexanoic Acid (PFHxA)   | 2.37          | 38.2     | 51.2     | 128          | -    | -         | -             | -    | 69-168          | -   | -    | 30         |
| Perfluorheptanoic Acid (PFHpA)   | ND            | 38.2     | 48.0     | 126          | -    | -         | -             | -    | 58-159          | -   | -    | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND            | 34.9     | 45.2     | 130          | -    | -         | -             | -    | 69-177          | -   | -    | 30         |
| Perfluorooctanoic Acid (PFOA)  | 2.21          | 38.2     | 52.2     | 131          | -    | -         | -             | -    | 63-159          | -   | -    | 30         |
| Perfluorononanoic Acid (PFNA)  | ND            | 38.2     | 51.8     | 136          | -    | -         | -             | -    | 68-171          | -   | -    | 30         |
| Perfluorooctanesulfonic Acid (PFOS)  | 5.17          | 35.4     | 58.1     | 150          | -    | -         | -             | -    | 52-151          | -   | -    | 30         |
| Perfluorodecanoic Acid (PFDA)  | ND            | 38.2     | 52.0     | 136          | -    | -         | -             | -    | 63-171          | -   | -    | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)  | ND            | 38.2     | 45.4     | 119          | -    | -         | -             | -    | 60-166          | -   | -    | 30         |
| Perfluoroundecanoic Acid (PFUnA)   | ND            | 38.2     | 51.4     | 134          | -    | -         | -             | -    | 60-153          | -   | -    | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)  | ND            | 38.2     | 51.6     | 135          | -    | -         | -             | -    | 45-170          | -   | -    | 30         |
| Perfluorododecanoic Acid (PFDoA)   | ND            | 38.2     | 51.2     | 134          | -    | -         | -             | -    | 67-153          | -   | -    | 30         |
| Perfluorotridecanoic Acid (PFTiDA)   | ND            | 38.2     | 48.2     | 126          | -    | -         | -             | -    | 48-158          | -   | -    | 30         |
| Perfluorotetradecanoic Acid (PFTA)   | ND            | 38.2     | 53.6     | 140          | -    | -         | -             | -    | 59-182          | -   | -    | 30         |

| Surrogate (Extracted Internal Standard)                                | MS         |           | MSD        |           | Acceptance Criteria |
|--|------------|-----------|------------|-----------|---------------------|
|  | % Recovery | Qualifier | % Recovery | Qualifier |                     |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 81         |           |            |           | 1-313               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5 NEFOSAA)   | 48         |           |            |           | 23-146              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 51         |           |            |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 73         |           |            |           | 40-144              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 68         |           |            |           | 38-144              |



**Matrix Spike Analysis**  
Batch Quality Control

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

| Parameter  | Native Sample | MS Added | MS Found | MS %Recovery | Qual | MSD Found | MSD %Recovery | Qual | Recovery Limits | RPD | Qual | RPD Limits |
|--|---------------|----------|----------|--------------|------|-----------|---------------|------|-----------------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-05,07-11,13-15 QC Batch ID: WG1391540-4 QC Sample: L2028498-02<br>Client ID: T1-W1 |               |          |          |              |      |           |               |      |                 |     |      |            |
| <b>Surrogate (Extracted Internal Standard)</b>   |               |          |          |              |      |           |               |      |                 |     |      |            |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   |               |          |          | 69           |      |           |               |      |                 |     |      | 21-145     |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  |               |          |          | 79           |      |           |               |      |                 |     |      | 30-139     |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)   |               |          |          | 86           |      |           |               |      |                 |     |      | 47-153     |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  |               |          |          | 71           |      |           |               |      |                 |     |      | 24-161     |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   |               |          |          | 54           |      |           |               |      |                 |     |      | 33-143     |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  |               |          |          | 73           |      |           |               |      |                 |     |      | 42-146     |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  |               |          |          | 74           |      |           |               |      |                 |     |      | 36-149     |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  |               |          |          | 68           |      |           |               |      |                 |     |      | 34-146     |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  |               |          |          | 80           |      |           |               |      |                 |     |      | 31-159     |



Project Name: PFAS STUDY  
Project Number: Not Specified

**Lab Duplicate Analysis**  
Batch Quality Control

Lab Number: L2028498  
Report Date: 08/07/20

| Parameter   | Native Sample | Duplicate Sample | Units | RPD | Qual | RPD Limits |
|---|---------------|------------------|-------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-05,07-11,13-15 QC Batch ID: WG1391540-5 QC Sample: L2028498-03 Client ID: T1-W2 |               |                  |       |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)   | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 2.48          | 2.42             | ng/l  | 2   |      | 30         |
| Perfluoroheptanoic Acid (PFHpA)   | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 2.10          | 2.08             | ng/l  | 1   |      | 30         |
| Perfluorononanoic Acid (PFNA)   | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 2.17          | 2.04             | ng/l  | 6   |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | ND            | ND               | ng/l  | NC  |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | ND            | ND               | ng/l  | NC  |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorododecanoic Acid (PFDoA)  | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorotridecanoic Acid (PFTriDA)   | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | ND            | ND               | ng/l  | NC  |      | 30         |

| Surrogate (Extracted Internal Standard)                        | %Recovery | Qualifier | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|-----------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)              | 77        |           | 75        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS) | 72        |           | 71        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)               | 67        |           | 65        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                | 76        |           | 74        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)             | 83        |           | 80        |           | 47-153              |



Project Name: PFAS STUDY  
Project Number: Not Specified

**Lab Duplicate Analysis**  
Batch Quality Control

Lab Number: L2028498  
Report Date: 08/07/20

| Parameter  | Native Sample | Duplicate Sample | Units     | RPD       | Qual                | RPD Limits |   |           |           |           |           |                     |                                       |    |  |    |  |        |                                       |    |  |    |  |        |   |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |       |   |    |  |    |  |        |  |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |        |
|--|---------------|------------------|-----------|-----------|---------------------|------------|---|-----------|-----------|-----------|-----------|---------------------|---------------------------------------|----|--|----|--|--------|---------------------------------------|----|--|----|--|--------|---|----|--|----|--|--------|---|----|--|----|--|--------|--|----|--|----|--|-------|---|----|--|----|--|--------|--|----|--|----|--|--------|---|----|--|----|--|--------|--|----|--|----|--|--------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-05,07-11,13-15 QC Batch ID: WG1391540-5 QC Sample: L2028498-03 Client ID: T1-W2  |               |                  |           |           |                     |            |   |           |           |           |           |                     |                                       |    |  |    |  |        |                                       |    |  |    |  |        |   |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |       |   |    |  |    |  |        |  |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |        |
| <table border="1"> <thead> <tr> <th>Surrogate (Extracted Internal Standard)</th> <th>%Recovery</th> <th>Qualifier</th> <th>%Recovery</th> <th>Qualifier</th> <th>Acceptance Criteria</th> </tr> </thead> <tbody> <tr> <td>Perfluoro[13C8]Octanoic Acid (M8PFOA)</td> <td>72</td> <td></td> <td>70</td> <td></td> <td>36-149</td> </tr> <tr> <td>Perfluoro[13C9]Nonanoic Acid (M9PFNA)</td> <td>65</td> <td></td> <td>63</td> <td></td> <td>34-146</td> </tr> <tr> <td>Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)</td> <td>65</td> <td></td> <td>65</td> <td></td> <td>42-146</td> </tr> <tr> <td>Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)</td> <td>61</td> <td></td> <td>62</td> <td></td> <td>38-144</td> </tr> <tr> <td>N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)</td> <td>35</td> <td></td> <td>44</td> <td></td> <td>1-181</td> </tr> <tr> <td>Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUUA)</td> <td>65</td> <td></td> <td>67</td> <td></td> <td>40-144</td> </tr> <tr> <td>N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEFOSAA)</td> <td>45</td> <td></td> <td>43</td> <td></td> <td>23-146</td> </tr> <tr> <td>Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)</td> <td>60</td> <td></td> <td>63</td> <td></td> <td>24-161</td> </tr> <tr> <td>Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)</td> <td>47</td> <td></td> <td>50</td> <td></td> <td>33-143</td> </tr> </tbody> </table> |               |                  |           |           |                     |            | Surrogate (Extracted Internal Standard) | %Recovery | Qualifier | %Recovery | Qualifier | Acceptance Criteria | Perfluoro[13C8]Octanoic Acid (M8PFOA) | 72 |  | 70 |  | 36-149 | Perfluoro[13C9]Nonanoic Acid (M9PFNA) | 65 |  | 63 |  | 34-146 | Perfluoro[13C8]Octanesulfonic Acid (M8PFOS) | 65 |  | 65 |  | 42-146 | Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA) | 61 |  | 62 |  | 38-144 | N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 35 |  | 44 |  | 1-181 | Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUUA) | 65 |  | 67 |  | 40-144 | N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEFOSAA) | 45 |  | 43 |  | 23-146 | Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA) | 60 |  | 63 |  | 24-161 | Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA) | 47 |  | 50 |  | 33-143 |
| Surrogate (Extracted Internal Standard)  | %Recovery     | Qualifier        | %Recovery | Qualifier | Acceptance Criteria |            |   |           |           |           |           |                     |                                       |    |  |    |  |        |                                       |    |  |    |  |        |   |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |       |   |    |  |    |  |        |  |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |        |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 72            |                  | 70        |           | 36-149              |            |   |           |           |           |           |                     |                                       |    |  |    |  |        |                                       |    |  |    |  |        |   |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |       |   |    |  |    |  |        |  |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |        |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 65            |                  | 63        |           | 34-146              |            |   |           |           |           |           |                     |                                       |    |  |    |  |        |                                       |    |  |    |  |        |   |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |       |   |    |  |    |  |        |  |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |        |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 65            |                  | 65        |           | 42-146              |            |   |           |           |           |           |                     |                                       |    |  |    |  |        |                                       |    |  |    |  |        |   |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |       |   |    |  |    |  |        |  |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |        |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 61            |                  | 62        |           | 38-144              |            |   |           |           |           |           |                     |                                       |    |  |    |  |        |                                       |    |  |    |  |        |   |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |       |   |    |  |    |  |        |  |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |        |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)   | 35            |                  | 44        |           | 1-181               |            |   |           |           |           |           |                     |                                       |    |  |    |  |        |                                       |    |  |    |  |        |   |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |       |   |    |  |    |  |        |  |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |        |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUUA)  | 65            |                  | 67        |           | 40-144              |            |   |           |           |           |           |                     |                                       |    |  |    |  |        |                                       |    |  |    |  |        |   |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |       |   |    |  |    |  |        |  |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |        |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEFOSAA)   | 45            |                  | 43        |           | 23-146              |            |   |           |           |           |           |                     |                                       |    |  |    |  |        |                                       |    |  |    |  |        |   |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |       |   |    |  |    |  |        |  |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |        |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 60            |                  | 63        |           | 24-161              |            |   |           |           |           |           |                     |                                       |    |  |    |  |        |                                       |    |  |    |  |        |   |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |       |   |    |  |    |  |        |  |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |        |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 47            |                  | 50        |           | 33-143              |            |   |           |           |           |           |                     |                                       |    |  |    |  |        |                                       |    |  |    |  |        |   |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |       |   |    |  |    |  |        |  |    |  |    |  |        |   |    |  |    |  |        |  |    |  |    |  |        |



Project Name: PFAS STUDY  
 Project Number: Not Specified

Serial\_No:08072015:17  
 Lab Number: L2028498  
 Report Date: 08/07/20

**Sample Receipt and Container Information**

Were project specific reporting limits specified? YES

**Cooler Information**  
 Cooler Custody Seal  
 A Absent

**Container Information**

| Container ID | Container Type                      | Cooler | Initial pH | Final pH | Temp deg C | Pres | Seal   | Frozen Date/Time | Analysis(*)           |
|--------------|-------------------------------------|--------|------------|----------|------------|------|--------|------------------|-----------------------|
| L2028498-01A | 2 Plastic(1) Plastic(1) H2O Plastic | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-02A | 2 Plastic(1) Plastic(1) H2O Plastic | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-02B | Plastic 250ml unpreserved           | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-03A | Plastic 250ml unpreserved           | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-03B | Plastic 250ml unpreserved           | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-04A | Plastic 250ml unpreserved           | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-04B | Plastic 250ml unpreserved           | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-05A | Plastic 250ml unpreserved           | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-05B | Plastic 250ml unpreserved           | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-06A | 2 Plastic(1) Plastic(1) H2O Plastic | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE-36(14) |
| L2028498-07A | Plastic 250ml unpreserved           | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-07B | Plastic 250ml unpreserved           | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-08A | Plastic 250ml unpreserved           | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-08B | Plastic 250ml unpreserved           | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-09A | 2 Plastic(1) Plastic(1) H2O Plastic | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-09B | Plastic 250ml unpreserved           | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-10A | Plastic 250ml unpreserved           | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-10B | Plastic 250ml unpreserved           | A      | NA         |          | 3.2        | Y    | Absent |                  | -                     |
| L2028498-11A | Plastic 250ml unpreserved           | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-11B | Plastic 250ml unpreserved           | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |
| L2028498-12A | 2 Plastic(1) Plastic(1) H2O Plastic | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE-36(14) |
| L2028498-12B | 2 Plastic(1) Plastic(1) H2O Plastic | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE-36(14) |
| L2028498-13A | 2 Plastic(1) Plastic(1) H2O Plastic | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14)    |

\*Values in parentheses indicate holding time in days



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Serial\_No:**08072015:17  
**Lab Number:** L2028498  
**Report Date:** 08/07/20

**Container Information**

| <b>Container ID</b> | <b>Container Type</b>     | <b>Cooler</b> | <b>Initial pH</b> | <b>Final pH</b> | <b>Temp deg C</b> | <b>Pres</b> | <b>Seal</b> | <b>Frozen Date/Time</b> | <b>Analysis(*)</b> |
|---------------------|---------------------------|---------------|-------------------|-----------------|-------------------|-------------|-------------|-------------------------|--------------------|
| L2028498-14A        | Plastic 250ml unpreserved | A             | NA                |                 | 3.2               | Y           | Absent      |                         | A2-537-ISOTOPE(14) |
| L2028498-14B        | Plastic 250ml unpreserved | A             | NA                |                 | 3.2               | Y           | Absent      |                         | A2-537-ISOTOPE(14) |
| L2028498-15A        | Plastic 250ml unpreserved | A             | NA                |                 | 3.2               | Y           | Absent      |                         | A2-537-ISOTOPE(14) |
| L2028498-15B        | Plastic 250ml unpreserved | A             | NA                |                 | 3.2               | Y           | Absent      |                         | A2-537-ISOTOPE(14) |

\*Values in parentheses indicate holding time in days



Project Name: PFAS STUDY  
 Project Number:

Serial\_No:08072015:17  
 Lab Number: L2028498  
 Report Date: 08/07/20

**PFAS PARAMETER SUMMARY**

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





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

## GLOSSARY

### Acronyms

|                 |  |
|-----------------|--|
| <b>DL</b>       | - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  |
| <b>EDL</b>      | - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME)  |
| <b>EMPC</b>     | - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.   |
| <b>EPA</b>      | - Environmental Protection Agency.   |
| <b>LCS</b>      | - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.  |
| <b>LCSd</b>     | - Laboratory Control Sample Duplicate: Refer to LCS.   |
| <b>LIB</b>      | - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.   |
| <b>LOD</b>      | - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)   |
| <b>LOQ</b>      | - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)<br><br>Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) |
| <b>MDL</b>      | - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.  |
| <b>MS</b>       | - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 3320, the spike recovery is calculated using the native concentration, including estimated values.   |
| <b>MSD</b>      | - Matrix Spike Sample Duplicate: Refer to MS.  |
| <b>NA</b>       | - Not Applicable.  |
| <b>NC</b>       | - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.   |
| <b>NDPA/DPA</b> | - N-Nitrosodiphenylamine/Diphenylamine.  |
| <b>NI</b>       | - Not Identifiable.  |
| <b>NP</b>       | - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.  |
| <b>RI</b>       | - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RI includes any adjustments from dilutions, concentrations or moisture content, where applicable.   |
| <b>RPD</b>      | - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values, although the RPD value will be provided in the report.  |
| <b>SRM</b>      | - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.   |
| <b>STLP</b>     | - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.  |
| <b>TEF</b>      | - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.   |
| <b>TEQ</b>      | - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.  |
| <b>TIC</b>      | - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.  |

### Footnotes

Report Format: Data Usability Report



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

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

**Terms**

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1.8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

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

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

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 18 hours from sample collection, value will be reflected in **bold**.

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

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

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (S)' result is defined as the summation of results for: PFOA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

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

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

**Data Qualifiers**

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration. (DOD and NYSDEC Part 375 PFAS only.)
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP/CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration

Report Format: Data Usability Report



**Project Name:** PFAS STUDY

**Lab Number:** L2028498

**Project Number:** Not Specified

**Report Date:** 08/07/20

**Data Qualifiers**

Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only)

- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028498  
**Report Date:** 08/07/20

**REFERENCES**

- 134 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) using Isotope Dilution. Alpha SOP 23528.

**LIMITATION OF LIABILITIES**

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

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



### Certification Information

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

**Westborough Facility**

**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene  
**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene, SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene.  
**EPA 8270D:** NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.  
**SM1500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

**Mansfield Facility**

**SM 2540D:** TSS  
**EPA 8082A:** NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.  
**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.  
**EPA TO-12** Non-methane organics  
**EPA 3C** Fixed gases  
**Biological Tissue Matrix:** EPA 3050B

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

**Westborough Facility:**

**Drinking Water**

**EPA 300.6:** Chloride, Nitrate-N, Fluoride, Sulfate, **EPA 353.2:** Nitrate-N, Nitrite-N, **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM1500H-B, SM4500NO2-B**  
**EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.  
**Microbiology:** **SM9215B, SM9223-P/A, SM9223B-Colilert-QT,SM9222D.**

**Non-Potable Water**

**SM4500H.B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LCHAT 10-107-06-1-B,** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2.** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.  
**EPA 624.1** Volatile Halocarbons & Aromatics,  
**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs  
**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil  
**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

**Mansfield Facility:**

**Drinking Water**

**EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg, EPA 522.**

**Non-Potable Water**

**EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.  
**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.  
**EPA 245.1 Hg, SM2340B**

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



ANALYTICAL REPORT

|                 |  |
|-----------------|--|
| Lab Number:     | L2028496   |
| Client:         | Maryland Department of the Environment<br>1800 Washington Boulevard<br>Baltimore, MD 21230 |
| ATTN:           | Amy Laliberte  |
| Phone:          | (410) 537-3614   |
| Project Name:   | PFAS STUDY   |
| Project Number: | Not Specified  |
| Report Date:    | 08/06/20   |

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

Certifications & Approvals: MA (M MA030), NH NELAP (2062), CT (PH 0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA0030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68 02089), RI (LA000299), TX (T104704419), VT (VT 0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330 17 00150), USFWS (Permit #206964).

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



Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028496  
Report Date: 08/06/20

| Alpha Sample ID | Client ID | Matrix | Sample Location | Collection Date/Time | Receive Date |
|-----------------|-----------|--------|-----------------|----------------------|--------------|
| L2028496-01     | FB-5A     | WATER  | Not Specified   | 07/07/20 09:00       | 07/07/20     |
| L2028496-02     | T5-W3     | WATER  | Not Specified   | 07/07/20 09:00       | 07/07/20     |
| L2028496-03     | T5-W2     | WATER  | Not Specified   | 07/07/20 09:10       | 07/07/20     |
| L2028496-04     | T5-W1     | WATER  | Not Specified   | 07/07/20 09:18       | 07/07/20     |
| L2028496-05     | FB-2A     | WATER  | Not Specified   | 07/07/20 09:31       | 07/07/20     |
| L2028496-06     | T2-W3     | WATER  | Not Specified   | 07/07/20 09:31       | 07/07/20     |
| L2028496-07     | T2-W2     | WATER  | Not Specified   | 07/07/20 09:38       | 07/07/20     |
| L2028496-08     | T2-W1     | WATER  | Not Specified   | 07/07/20 09:44       | 07/07/20     |
| L2028496-09     | FB-8B     | WATER  | Not Specified   | 07/07/20 09:52       | 07/07/20     |
| L2028496-10     | WFDS-W2   | WATER  | Not Specified   | 07/07/20 09:52       | 07/07/20     |
| L2028496-11     | WFDS-W1   | WATER  | Not Specified   | 07/07/20 09:59       | 07/07/20     |
| L2028496-12     | TB-001    | WATER  | Not Specified   | 07/07/20 06:00       | 07/07/20     |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

### Case Narrative

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

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

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

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

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

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

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**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**Case Narrative (continued)**

**Perfluorinated Alkyl Acids by Isotope Dilution**

L2028496-01, -03, -04, -05, -07, -08, and -09: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

L2028496-05: The MeOH fraction of the extraction is reported for the following compounds: N-Methyl Perfluorooctane Sulfonamide (NMeFOSA) and N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA) due to better extraction efficiency of the Surrogates (Extracted Internal Standards).

L2028496-07: The MeOH fraction of the extraction is reported for the following compounds:

Perfluorooctanesulfonamide (FOSA), N-Methyl Perfluorooctane Sulfonamide (NMeFOSA), N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA), N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE), and N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE) due to better extraction efficiency of the Surrogates (Extracted Internal Standards).

L2028496-05 and -07(MEOH): Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

WG1391399-1, WG1391399-2, WG1391399-3, and WG1391399-5(MEOH): Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

WG1391399-1, WG1391399-2, and WG1391399-3: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

WG1391399-2/-3: The LCS/LCSD recoveries, associated with L2028496-05 and -07, are above the acceptance criteria for perfluorotridecanoic acid (pftdda) (196%/159%), perfluorohexadecanoic acid (pfxda) (396%/363%), 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9cl-pf3ons) (302%/297%), 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11cl-pf3ouds) (300%/302%), n-methyl perfluorooctanesulfonamido ethanol (nmefose) (386%/273%) and n-ethyl perfluorooctanesulfonamido ethanol (nefose) (266%/298%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

WG1391399-2/-3: The LCS/LCSD RPD, associated with L2028496-05 and -07, is above the acceptance criteria for n-ethyl perfluorooctanesulfonamidoacetic acid (nefosaa) (51%) and n-methyl

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**Case Narrative (continued)**

perfluorooctanesulfonamido ethanol (nmefose) (34%).

WG1391399-2/-3(MEOH): The LCS/LCSD recoveries, associated with L2028496-05 and -07, are above the acceptance criteria for n-methyl perfluorooctanesulfonamido ethanol (nmefose) (325%/392%) and n-ethyl perfluorooctanesulfonamido ethanol (nefose) (214% LCS only); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

WG1391399-2/-3(MEOH): The LCS/LCSD RPD, associated with L2028496-05 and -07, is above the acceptance criteria for n-ethyl perfluorooctanesulfonamido ethanol (nefose) (60%).

WG1391400-2/-3: The LCS/LCSD recoveries, associated with L2028496-01 through -04,-06 and -08 through -11 are above the acceptance criteria for perfluorotridecanoic acid (pftdda) (181%/162%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

WG1391400-2/-3: The LCS/LCSD RPD, associated with L2028496-L2028496-01 through -04,-06 and -08 through -11 is above the acceptance criteria for n-ethyl perfluorooctanesulfonamidoacetic acid (nefosaa) (37%).

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

Authorized Signature:

 Alycia Mogayzel

Title: Technical Director/Representative

Date: 08/06/20



# ORGANICS



# SEMIVOLATILES



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

**Lab ID:** L2028496-01  
**Client ID:** FB-5A  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:00  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 23:02  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 07:30

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.88 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.88 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.88 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

Lab ID: L2028496-01  
 Client ID: FB-5A  
 Sample Location: Not Specified

Date Collected: 07/07/20 09:00  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 129        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 67         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 101        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 95         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 108        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 83         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 81         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 87         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 80         |           | 58-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 46         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 74         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 32         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 57         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 32         | Q         | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

**Lab ID:** L2028496-02  
**Client ID:** T5-W3  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:00  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 23:19  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 07:30

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.33   |           | ng/l  | 2.04 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 2.12   |           | ng/l  | 2.04 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 2.04 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 2.04 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)              | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 2.04 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

Lab ID: L2028496-02  
 Client ID: T5-W3  
 Sample Location: Not Specified

Date Collected: 07/07/20 09:00  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 118        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 106        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 89         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 83         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 104        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 73         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 70         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 78         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 65         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 42         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 57         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 34         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 48         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 37         |           | 33-143              |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

Lab ID: L2028496-03  
 Client ID: T5-W2  
 Sample Location: Not Specified

Date Collected: 07/07/20 09:10  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:  
 Matrix: Water  
 Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 07/16/20 23:52  
 Analyst: RS

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 07:30

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.91 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.10   |           | ng/l  | 1.91 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.91 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.91 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 2.12   |           | ng/l  | 1.91 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.91 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 1.99   |           | ng/l  | 1.91 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.91 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.91 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.91 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.91 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.91 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.91 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.91 | --  | 1               |



Serial\_No:08062017:02

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

Lab ID: L2028496-03  
 Client ID: T5-W2  
 Sample Location: Not Specified

Date Collected: 07/07/20 09:10  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 112        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 102        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 93         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 90         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 102        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 77         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 70         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 76         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 68         |           | 58-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 37         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 58         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 41         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 51         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 32         | Q         | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

**Lab ID:** L2028496-04  
**Client ID:** T5-W1  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:18  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/17/20 00:25  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 07:30

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.28   |           | ng/l  | 1.85 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 2.19   |           | ng/l  | 1.85 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 2.10   |           | ng/l  | 1.85 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.85 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.85 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.85 | --  | 1               |



Serial\_No:08062017:02

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028496  
Report Date: 08/06/20

**SAMPLE RESULTS**

Lab ID: L2028496-04  
Client ID: T5-W1  
Sample Location: Not Specified

Date Collected: 07/07/20 09:18  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 107        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 95         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 88         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 84         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 97         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 72         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 66         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 67         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 68         |           | 58-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 28         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 59         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 23         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 38         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 29         | Q         | 33-143              |



Serial\_No:08062017:02

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

Lab ID: L2028496-05  
Client ID: FB-2A  
Sample Location: Not Specified

Date Collected: 07/07/20 09:31  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:  
Matrix: Water  
Analytical Method: 134,LCMSMS-ID  
Analytical Date: 07/17/20 10:22  
Analyst: RS

Extraction Method: ALPHA 23528  
Extraction Date: 07/13/20 06:41

| Parameter  | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|--|--------|-----------|-------|------|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |      |     |                 |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                 | ND     |           | ng/l  | 17.8 | --  | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                  | ND     |           | ng/l  | 17.8 | --  | 1               |

| Surrogate (Extracted Internal Standard)                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA) | 10         | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)  | 6          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

**Lab ID:** L2028496-05  
**Client ID:** FB-2A  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:31  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/18/20 00:11  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 06:41

| Parameter  | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|--|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>              |        |           |       |      |     |                 |
| Perfluorobutanoic Acid (PFBA)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorononanoic Acid (PFNA)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                          | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                           | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoro(propoxy)-Propanoic Acid (HFPO-DA) | ND     |           | ng/l  | 44.4 | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)  | ND     |           | ng/l  | 3.55 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

**Lab ID:** L2028496-05  
**Client ID:** FB-2A  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:31  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/l  | 3.55 | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/l  | 1.78 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/l  | 4.44 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)         | ND     |           | ng/l  | 1.78 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/l  | 1.78 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/l  | 44.4 | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEFOSE)                   | ND     |           | ng/l  | 44.4 | -   | 1               |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 57         |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 75         |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 136        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 78         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 66         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 61         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 123        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 55         |           | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 74         |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 48         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 104        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 51         |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 58         |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 27         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 50         |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 59         |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 27         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 36         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 23         | O         | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 19         | O         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 51         |           | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 27         | O         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)                     | 12         | O         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

Lab ID: L2028496-06  
 Client ID: T2-W3  
 Sample Location: Not Specified

Date Collected: 07/07/20 09:31  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:  
 Matrix: Water  
 Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 07/17/20 00:42  
 Analyst: RS

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 07:30

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.18   |           | ng/l  | 1.84 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 1.91   | F         | ng/l  | 1.84 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 2.17   |           | ng/l  | 1.84 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.84 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.84 | --  | 1               |





Serial\_No:08062017:02

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028496  
Report Date: 08/06/20

**SAMPLE RESULTS**

Lab ID: L2028496-06  
Client ID: T2-W3  
Sample Location: Not Specified

Date Collected: 07/07/20 09:31  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 116        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 103        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 92         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 92         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 106        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 80         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 74         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 80         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 78         |           | 58-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 39         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 58         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 42         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 51         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 35         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

**Lab ID:** L2028496-07  
**Client ID:** T2-W2  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:38  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/17/20 10:38  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 06:41

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorooctanesulfonamide (FOSA)                                     | ND     |           | ng/l  | 1.98 | --  | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/l  | 19.8 | --  | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/l  | 19.8 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/l  | 49.6 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/l  | 49.6 | --  | 1               |

| Surrogate (Extracted Internal Standard)                               | % Recovery | Qualifier | Acceptance Criteria |
|---|------------|-----------|---------------------|
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                             | 7          |           | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 9          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                 | 7          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 13         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)  | 6          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

**Lab ID:** L2028496-07  
**Client ID:** T2-W2  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:38  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/18/20 00:27  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 06:41

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |      |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.09   |           | ng/l  | 1.98 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 2.20   |           | ng/l  | 1.98 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)                           | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/l  | 1.98 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/l  | 49.6 | --  | 1               |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/l  | 3.97 | --  | 1               |
| Perfluorooctadecanoic Acid (PFODA)  | ND     |           | ng/l  | 3.97 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

**Lab ID:** L2028496-07  
**Client ID:** T2-W2  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:38  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/l  | 1.98 | -   | 1               |
| 1H,1H,2H,2H Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/l  | 4.98 | -   | 1               |
| 9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)         | ND     |           | ng/l  | 1.98 | -   | 1               |
| 11-Chloroicosafafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUDS)   | ND     |           | ng/l  | 1.98 | -   | 1               |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 11         |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 11         | Q         | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 60         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2,4:2FTS)                           | 57         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 8          | Q         | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 8          | Q         | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 53         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 7          | Q         | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 32         |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 8          | Q         | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 42         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 10         | Q         | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 25         |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 19         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 12         | Q         | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 19         | Q         | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 16         | Q         | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 13         | Q         | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 2          | Q         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 28         | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

**Lab ID:** L2028496-08  
**Client ID:** T2-W1  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:44  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/17/20 00:58  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 07:30

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 2.08 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.23   |           | ng/l  | 2.08 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 2.08 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 2.08 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 2.10   |           | ng/l  | 2.08 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 2.08 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 2.08 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 2.08 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 2.08 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 2.08 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 2.08 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 2.08 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 2.08 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 2.08 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

Lab ID: L2028496-08  
 Client ID: T2-W1  
 Sample Location: Not Specified

Date Collected: 07/07/20 09:44  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 112        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 90         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 87         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 89         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 99         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 78         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 69         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 70         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 68         |           | 58-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 33         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 59         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 36         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 51         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 30         | Q         | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

**Lab ID:** L2028496-09  
**Client ID:** FB-8B  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:52  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/17/20 01:15  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 07:30

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.81 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.81 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.81 | --  | 1               |



Serial\_No:08062017:02

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

**Lab ID:** L2028496-09  
**Client ID:** FB-8B  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:52  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 128        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 52         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 98         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 90         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 106        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 80         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 74         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 79         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 77         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 40         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 66         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 53         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 65         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 31         | Q         | 33-143              |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

**Lab ID:** L2028496-10  
**Client ID:** WFDS-W2  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 09:52  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/17/20 01:31  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 07:30

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.11   |           | ng/l  | 2.04 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 2.07   |           | ng/l  | 2.04 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 2.04 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 2.04 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 2.04 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 2.04 | --  | 1               |



Serial\_No:08062017:02

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

Lab ID: L2028496-10  
 Client ID: WFDS-W2  
 Sample Location: Not Specified

Date Collected: 07/07/20 09:52  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 126        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 101        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 99         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 98         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 111        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 82         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 71         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 79         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 73         |           | 58-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 39         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 67         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 37         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 50         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 39         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

Lab ID: L2028496-11 R  
 Client ID: WFDS-W1  
 Sample Location: Not Specified

Date Collected: 07/07/20 09:59  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:  
 Matrix: Water  
 Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 07/20/20 21:35  
 Analyst: SG

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 07:30

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.33   |           | ng/l  | 1.85 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 2.34   |           | ng/l  | 1.85 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.85 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.85 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.85 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.85 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

Lab ID: L2028496-11 R  
 Client ID: WFDS-W1  
 Sample Location: Not Specified

Date Collected: 07/07/20 09:59  
 Date Received: 07/07/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 90         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 129        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 83         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 82         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 86         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 78         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 72         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 74         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 68         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 59         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 58         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 53         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 53         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 53         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**SAMPLE RESULTS**

**Lab ID:** L2028496-12  
**Client ID:** TB-001  
**Sample Location:** Not Specified

**Date Collected:** 07/07/20 06:00  
**Date Received:** 07/07/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 07/16/20 13:17  
**Analyst:** JW

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 13:08

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.81 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.81 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.81 | --  | 1               |



Serial\_No:08062017:02

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028496  
Report Date: 08/06/20

**SAMPLE RESULTS**

Lab ID: L2028496-12  
Client ID: TB-001  
Sample Location: Not Specified

Date Collected: 07/07/20 06:00  
Date Received: 07/07/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 81         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 55         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 68         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 75         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 83         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 73         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 67         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 74         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 70         |           | 58-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 56         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 78         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 55         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 72         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 42         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 07/17/20 08:42  
 Analyst: RS

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 06:41

| Parameter  | Result | Qualifier | Units | RL   | MDL |
|--|--------|-----------|-------|------|-----|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 05,07 Batch: WG1391399-1 |        |           |       |      |     |
| Perfluorooctanesulfonamide (FOSA)  | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)   | ND     |           | ng/l  | 20.0 | --  |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)  | ND     |           | ng/l  | 20.0 | --  |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)  | ND     |           | ng/l  | 50.0 | --  |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)   | ND     |           | ng/l  | 50.0 | --  |

| Surrogate (Extracted Internal Standard)                               | %Recovery | Qualifier | Acceptance Criteria |
|---|-----------|-----------|---------------------|
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                             | 10        |           | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 8         | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                 | 7         | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 7         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)  | 6         | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 07/17/20 22:10  
 Analyst: RS

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 06:41

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 05,07 Batch: WG1391399-1</b> |        |           |       |      |     |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/l  | 2.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/l  | 2.00 | --  |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy] Propanoic Acid (HFPO-DA)                             | ND     |           | ng/l  | 50.0 | --  |
| 4,8-Dioxo-3h-Perfluorononanoic Acid (ADONA)   | ND     |           | ng/l  | 2.00 | --  |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**Method Blank Analysis  
 Batch Quality Control**

**Analytical Method:** 134.LCMSMS-ID  
**Analytical Date:** 07/17/20 22:10  
**Analyst:** RS

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 07/13/20 06:41

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 05,07 Batch: WG1391399-1</b> |        |           |       |      |     |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/l  | 4.00 | --  |
| Perfluorooctadecanoic Acid (PFODA)  | ND     |           | ng/l  | 4.00 | --  |
| Perfluorododecane Sulfonic Acid (PFDoDS)  | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)  | ND     |           | ng/l  | 5.00 | --  |
| 9-Chlorohexadecafluoro-3-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)   | ND     |           | ng/l  | 2.00 | --  |
| 11-Chloroicosafafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)   | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | ND     |           | ng/l  | 20.0 | --  |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | ND     |           | ng/l  | 20.0 | --  |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)   | ND     |           | ng/l  | 50.0 | --  |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEFOSE)   | ND     |           | ng/l  | 50.0 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 07/17/20 22:10  
 Analyst: RS

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 06:41

**Parameter** **Result** **Qualifier** **Units** **RL** **MDL**  
 Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 05,07 Batch: WG1391399-1

| Surrogate (Extracted Internal Standard)  | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 43        |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 60        |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 118       |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 63        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 53        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 49        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 100       |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 44        |           | 38-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 63        |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 42        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 84        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 46        |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 48        |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 26        |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 47        |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 59        |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 17        | Q         | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 38        |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 34        |           | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 13        | Q         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 86        |           | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 5         | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                                    | 4         | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 15        | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)                     | 9         | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 07/17/20 18:01  
 Analyst: RS

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 07:30

| Parameter  | Result | Qualifier | Units | RL   | MDL |
|--|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-04,06,08-11 Batch: WG1391400-1 R</b> |        |           |       |      |     |
| Perfluorobutanesulfonic Acid (PFBS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanoic Acid (PFHxA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanoic Acid (PFOA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanoic Acid (PFNA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorodecanoic Acid (PFDA)  | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)   | ND     |           | ng/l  | 2.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDoA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)   | ND     |           | ng/l  | 2.00 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 07/17/20 18:01  
 Analyst: RS

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 07:30

| Parameter   | Result | Qualifier | Units | RL | MDL |
|---|--------|-----------|-------|----|-----|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-04,06,08-11 Batch: WG1391400-1 R |        |           |       |    |     |

| Surrogate (Extracted Internal Standard)                                | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)                                   | 88        |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)                                | 110       |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 117       |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)         | 94        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 102       |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 94        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 101       |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 86        |           | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-8:2FTS)         | 81        |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 83        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 87        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 61        |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)         | 83        |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 65        |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLDA)                | 85        |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                              | 38        |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 63        |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 70        |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 60        |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 07/16/20 12:28  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 13:08

| Parameter  | Result | Qualifier | Units | RL   | MDL |
|--|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 12 Batch: WG1391540-1</b> |        |           |       |      |     |
| Perfluorobutanesulfonic Acid (PFBS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanoic Acid (PFHxA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanoic Acid (PFOA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanoic Acid (PFNA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDA)  | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)   | ND     |           | ng/l  | 2.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDoA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)   | ND     |           | ng/l  | 2.00 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 07/16/20 12:28  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 07/13/20 13:08

| Parameter   | Result | Qualifier | Units | RL | MDL |
|---|--------|-----------|-------|----|-----|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 12 Batch: WG1391540-1 |        |           |       |    |     |

| Surrogate (Extracted Internal Standard)                                | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)                                   | 75        |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)                                | 71        |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 81        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)         | 53        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 69        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 75        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 86        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 72        |           | 38-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)         | 60        |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 67        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 75        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 72        |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)         | 58        |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 53        |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 82        |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                              | 25        |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 58        |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 75        |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 60        |           | 33-143              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028496  
Report Date: 08/06/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05,07 Batch: WG1391399-2 WG1391399-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanoic Acid (PFBA)   | 111       |      | 107       |      | 67-148           | 4   |      | 30         |
| Perfluoropentanoic Acid (PFPeA)   | 113       |      | 109       |      | 63-181           | 4   |      | 30         |
| Perfluorobutanesulfonic Acid (PFBS)   | 112       |      | 108       |      | 65-157           | 4   |      | 30         |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | 122       |      | 110       |      | 37-219           | 10  |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 115       |      | 114       |      | 69-188           | 1   |      | 30         |
| Perfluoropentanesulfonic Acid (PFPeS)   | 119       |      | 120       |      | 52-156           | 1   |      | 30         |
| Perfluorohepanoic Acid (PFHpA)  | 117       |      | 114       |      | 58-159           | 3   |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | 109       |      | 110       |      | 69-177           | 1   |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 123       |      | 117       |      | 63-159           | 5   |      | 30         |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (8:2FTS)   | 137       |      | 123       |      | 49-187           | 11  |      | 30         |
| Perfluorooheptanesulfonic Acid (PFHpS)  | 137       |      | 134       |      | 61-179           | 2   |      | 30         |
| Perfluorononanoic Acid (PFNA)   | 112       |      | 111       |      | 68-171           | 1   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 110       |      | 108       |      | 52-151           | 2   |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | 112       |      | 109       |      | 63-171           | 3   |      | 30         |
| 1H,1H,2H,2H-Perfluorodecane sulfonic Acid (8:2FTS)  | 123       |      | 141       |      | 56-173           | 14  |      | 30         |
| Perfluorononanesulfonic Acid (PFNS)   | 95        |      | 97        |      | 48-150           | 2   |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | 108       |      | 105       |      | 60-166           | 1   |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | 105       |      | 105       |      | 60-153           | 0   |      | 30         |
| Perfluorodecane sulfonic Acid (PFDS)  | 90        |      | 84        |      | 38-156           | 7   |      | 30         |
| Perfluorooctanesulfonamide (FOSA)   | 114       |      | 116       |      | 46-170           | 2   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | 85        |      | 143       |      | 45-170           | 51  | Q    | 30         |
| Perfluorododecanoic Acid (PFDoA)  | 145       |      | 108       |      | 67-153           | 29  |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028496  
Report Date: 08/06/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05,07 Batch: WG1391399-2 WG1391399-3 |           |      |           |      |                  |     |      |            |
| Perfluorotridecanoic Acid (PFTrDA)  | 196       | Q    | 159       | O    | 48-158           | 21  |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | 158       |      | 181       |      | 58-182           | 15  |      | 30         |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Hexafluoroisopropoxy]-Propanoic Acid (HFPO-DA)                                       | 133       |      | 128       |      | 50-150           | 4   |      | 30         |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)   | 111       |      | 104       |      | 50-150           | 7   |      | 30         |
| Perfluorohexadecanoic Acid (PFHxDA)   | 306       | Q    | 363       | O    | 50-150           | 9   |      | 30         |
| Perfluorooctadecanoic Acid (PFODA)  | 74        |      | 57        |      | 50-150           | 26  |      | 30         |
| Perfluorododecane Sulfonic Acid (PFDS)  | 125       |      | 125       |      | 50-150           | 0   |      | 30         |
| 1H,1H,2H,2H-Perfluorododecane sulfonic Acid (10:2FTS)   | 131       |      | 117       |      | 50-150           | 11  |      | 30         |
| 9-Chlorohexadecafluoro-3-Oxane-1-Sulfonic Acid (9Cl-PF3ONS)   | 302       | Q    | 297       | O    | 50-150           | 2   |      | 30         |
| 11-Chlorooctadecafluoro-3-Oxandecane-1-Sulfonic Acid (11Cl-PF3ONS)  | 300       | Q    | 302       | O    | 50-150           | 1   |      | 30         |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | 104       |      | 83        |      | 50-150           | 22  |      | 30         |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | 105       |      | 103       |      | 50-150           | 2   |      | 30         |
| N-Methyl Perfluorooctanesulfonamide Ethanol (NMeFOSE)   | 368       | Q    | 273       | O    | 50-150           | 34  | Q    | 30         |
| N-Ethyl Perfluorooctanesulfonamide Ethanol (NEFOSE)   | 266       | Q    | 296       | O    | 50-150           | 11  |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028496  
Report Date: 08/06/20

| Parameter   | LCS           |      | LCSD           |      | %Recovery Limits | RPD | Qual | RPD Limits          |
|---|---------------|------|----------------|------|------------------|-----|------|---------------------|
|   | %Recovery     | Qual | %Recovery      | Qual |                  |     |      |                     |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05,07 Batch: WG1391399-2 WG1391399-3 |               |      |                |      |                  |     |      |                     |
| Surrogate (Extracted Internal Standard)   | LCS %Recovery | Qual | LCSD %Recovery | Qual |                  |     |      | Acceptance Criteria |
| Perfluoro[13C4]Butanoic Acid (MPFBA)  | 50            |      | 58             |      |                  |     |      | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)   | 64            |      | 75             |      |                  |     |      | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)   | 131           |      | 127            |      |                  |     |      | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-6:2FTS)  | 81            |      | 83             |      |                  |     |      | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)  | 56            |      | 66             |      |                  |     |      | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)   | 50            |      | 62             |      |                  |     |      | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)  | 113           |      | 107            |      |                  |     |      | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PF OA)  | 45            |      | 55             |      |                  |     |      | 36-143              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-8:2FTS)  | 76            |      | 83             |      |                  |     |      | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)   | 40            |      | 50             |      |                  |     |      | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)   | 92            |      | 93             |      |                  |     |      | 42-148              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)   | 47            |      | 56             |      |                  |     |      | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)  | 61            |      | 64             |      |                  |     |      | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)  | 35            |      | 40             |      |                  |     |      | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFU DA)  | 43            |      | 48             |      |                  |     |      | 40-144              |
| Perfluoro[13C6]Octanesulfonamide (M6FOSA)   | 64            |      | 57             |      |                  |     |      | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)   | 30            |      | 26             |      |                  |     |      | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (M2PFDOA)  | 32            |      | 40             |      |                  |     |      | 24-181              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)  | 38            |      | 37             |      |                  |     |      | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)                                  | 19            | Q    | 25             | Q    |                  |     |      | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)   | 85            |      | 86             |      |                  |     |      | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)  | 8             | Q    | 2              | Q    |                  |     |      | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)   | 5             | Q    | 1              | Q    |                  |     |      | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)   | 42            | Q    | 57             |      |                  |     |      | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)  | 20            | Q    | 18             | Q    |                  |     |      | 50-150              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028496  
Report Date: 08/06/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05,07 Batch: WG1391399-2 WG1391399-3 |           |      |           |      |                  |     |      |            |
| Perfluorooctanesulfonamide (FOSA)   | 104       |      | 89        |      | 46-170           | 25  |      | 30         |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | 122       |      | 100       |      | 50-150           | 4   |      | 30         |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | 103       |      | 104       |      | 50-150           | 1   |      | 30         |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)   | 325       | Q    | 322       | Q    | 50-150           | 2   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEIFOSE)  | 214       | Q    | 143       |      | 50-150           | 60  | Q    | 30         |

| Surrogate (Extracted Internal Standard)                               | LCS       |      | LCSD      |      | Acceptance Criteria |
|---|-----------|------|-----------|------|---------------------|
|   | %Recovery | Qual | %Recovery | Qual |                     |
| Perfluoro[13C6]Octanesulfonamide (M6FOSA)                             | 9         |      | 9         |      | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 7         | Q    | 6         | Q    | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                 | 6         | Q    | 5         | Q    | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 17        | Q    | 12        | Q    | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)  | 6         | Q    | 9         | Q    | 50-150              |





**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028496  
Report Date: 08/06/20

| Parameter  | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|--|-----------|------|-----------|------|------------------|-----|------|------------|
|  | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04,08,08-11 Batch: WG1391400-2 WG1391400-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)  | 111       |      | 108       |      | 65-157           | 3   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)   | 116       |      | 114       |      | 59-188           | 2   |      | 30         |
| Perfluorheptanoic Acid (PFHpA)   | 113       |      | 111       |      | 58-159           | 2   |      | 30         |
| Perfluorhexanesulfonic Acid (PFHxS)  | 112       |      | 107       |      | 59-177           | 5   |      | 30         |
| Perfluorooctanoic Acid (PFOA)  | 122       |      | 115       |      | 63-159           | 6   |      | 30         |
| Perfluorononanoic Acid (PFNA)  | 109       |      | 112       |      | 68-171           | 3   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)  | 108       |      | 106       |      | 52-151           | 3   |      | 30         |
| Perfluorodecanoic Acid (PFDA)  | 119       |      | 110       |      | 63-171           | 8   |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)  | 103       |      | 119       |      | 80-186           | 14  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)   | 119       |      | 102       |      | 60-153           | 15  |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)   | 147       |      | 101       |      | 45-170           | 17  | Q    | 30         |
| Perfluorododecanoic Acid (PFDDA)   | 110       |      | 110       |      | 67-153           | 0   |      | 30         |
| Perfluorotridecanoic Acid (PFTDA)  | 111       | Q    | 162       | O    | 48-158           | 11  |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)   | 146       |      | 126       |      | 59-182           | 15  |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028496  
Report Date: 08/06/20

| Parameter  | LCS       |      | LCSD      |      | %Recovery Limits    | RPD | Qual | RPD Limits |
|--|-----------|------|-----------|------|---------------------|-----|------|------------|
|  | %Recovery | Qual | %Recovery | Qual |                     |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04,08,08-11 Batch: WG1391400-2 WG1391400-3 |           |      |           |      |                     |     |      |            |
| Surrogate (Extracted Internal Standard)  | LCS       |      | LCSD      |      | Acceptance Criteria |     |      |            |
|  | %Recovery | Qual | %Recovery | Qual |                     |     |      |            |
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 85        |      | 85        |      | 2-156               |     |      |            |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 107       |      | 108       |      | 16-173              |     |      |            |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 122       |      | 122       |      | 31-159              |     |      |            |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)   | 95        |      | 94        |      | 1-313               |     |      |            |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 98        |      | 101       |      | 21-145              |     |      |            |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 92        |      | 94        |      | 30-139              |     |      |            |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)   | 101       |      | 104       |      | 47-153              |     |      |            |
| Perfluoro[13C8]Octanoic Acid (M8PFDA)  | 83        |      | 86        |      | 36-149              |     |      |            |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)   | 84        |      | 82        |      | 1-244               |     |      |            |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 79        |      | 80        |      | 34-146              |     |      |            |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 91        |      | 86        |      | 42-146              |     |      |            |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 77        |      | 85        |      | 38-144              |     |      |            |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)   | 77        |      | 87        |      | 7-170               |     |      |            |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)   | 77        |      | 70        |      | 1-181               |     |      |            |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)  | 74        |      | 72        |      | 40-144              |     |      |            |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 85        |      | 87        |      | 1-87                |     |      |            |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 47        |      | 59        |      | 23-146              |     |      |            |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPDDA)   | 54        |      | 52        |      | 24-181              |     |      |            |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 55        |      | 55        |      | 33-143              |     |      |            |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028496  
Report Date: 08/06/20

| Parameter  | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|--|-----------|------|-----------|------|------------------|-----|------|------------|
|  | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 12 Batch: WG1391540-2 WG1391540-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)  | 126       |      | 137       |      | 65-157           | 8   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)   | 126       |      | 139       |      | 59-188           | 10  |      | 30         |
| Perfluorheptanoic Acid (PFHpA)   | 118       |      | 130       |      | 58-159           | 10  |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)   | 116       |      | 133       |      | 59-177           | 14  |      | 30         |
| Perfluorooctanoic Acid (PFOA)  | 125       |      | 136       |      | 63-159           | 8   |      | 30         |
| Perfluorononanoic Acid (PFNA)  | 122       |      | 134       |      | 68-171           | 9   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)  | 127       |      | 129       |      | 52-151           | 2   |      | 30         |
| Perfluorodecanoic Acid (PFDA)  | 122       |      | 127       |      | 63-171           | 4   |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)  | 114       |      | 128       |      | 80-186           | 12  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)   | 124       |      | 134       |      | 60-153           | 8   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)   | 127       |      | 136       |      | 45-170           | 7   |      | 30         |
| Perfluorododecanoic Acid (PFDDA)   | 127       |      | 133       |      | 67-153           | 5   |      | 30         |
| Perfluorotridecanoic Acid (PFTDA)  | 119       |      | 122       |      | 48-158           | 2   |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)   | 122       |      | 131       |      | 59-182           | 7   |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2028496  
Report Date: 08/06/20

| Parameter  | LCS       |      | LCSD      |      | %Recovery Limits    | RPD | Qual | RPD Limits |
|--|-----------|------|-----------|------|---------------------|-----|------|------------|
|  | %Recovery | Qual | %Recovery | Qual |                     |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 12 Batch: WG1391540-2 WG1391540-3 |           |      |           |      |                     |     |      |            |
| Surrogate (Extracted Internal Standard)  | LCS       |      | LCSD      |      | Acceptance Criteria |     |      |            |
|  | %Recovery | Qual | %Recovery | Qual |                     |     |      |            |
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 78        |      | 73        |      | 2-156               |     |      |            |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 74        |      | 70        |      | 16-173              |     |      |            |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 83        |      | 80        |      | 31-159              |     |      |            |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)   | 59        |      | 55        |      | 1-313               |     |      |            |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 72        |      | 66        |      | 21-145              |     |      |            |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 81        |      | 73        |      | 30-139              |     |      |            |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)   | 88        |      | 82        |      | 47-153              |     |      |            |
| Perfluoro[13C8]Octanoic Acid (M8PFDA)  | 76        |      | 71        |      | 36-149              |     |      |            |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)   | 67        |      | 65        |      | 1-244               |     |      |            |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 74        |      | 69        |      | 34-146              |     |      |            |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 76        |      | 78        |      | 42-146              |     |      |            |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 76        |      | 74        |      | 38-144              |     |      |            |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)   | 63        |      | 65        |      | 7-170               |     |      |            |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)  | 66        |      | 58        |      | 1-181               |     |      |            |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)  | 84        |      | 79        |      | 40-144              |     |      |            |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 33        |      | 38        |      | 1-87                |     |      |            |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 62        |      | 55        |      | 23-145              |     |      |            |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPDDA)   | 82        |      | 77        |      | 24-181              |     |      |            |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 65        |      | 62        |      | 33-143              |     |      |            |



**Matrix Spike Analysis**  
Batch Quality Control

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

| Parameter   | Native Sample | MS Added | MS Found | MS %Recovery | Qual | MSD Found | MSD %Recovery | Qual | Recovery Limits | RPD | Qual | RPD Limits |
|---|---------------|----------|----------|--------------|------|-----------|---------------|------|-----------------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04,06,08-11 QC Batch ID: WG1391400-4 QC Sample: L2028496-02<br>Client ID: T5-W3 |               |          |          |              |      |           |               |      |                 |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)   | ND            | 35.2     | 43.4     | 123          | -    | -         | -             | -    | 65-157          | -   | -    | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 2.33          | 39.8     | 48.4     | 116          | -    | -         | -             | -    | 69-168          | -   | -    | 30         |
| Perfluorooheptanoic Acid (PFHpA)  | ND            | 39.8     | 45.7     | 115          | -    | -         | -             | -    | 58-159          | -   | -    | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND            | 36.3     | 44.1     | 122          | -    | -         | -             | -    | 69-177          | -   | -    | 30         |
| Perfluorooctanoic Acid (PFOA)   | 2.12          | 39.8     | 56.2     | 136          | -    | -         | -             | -    | 63-159          | -   | -    | 30         |
| Perfluorononanoic Acid (PFNA)   | ND            | 39.8     | 44.8     | 113          | -    | -         | -             | -    | 68-171          | -   | -    | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | ND            | 36.8     | 47.2     | 128          | -    | -         | -             | -    | 52-151          | -   | -    | 30         |
| Perfluorodecanoic Acid (PFDA)   | ND            | 39.8     | 46.9     | 118          | -    | -         | -             | -    | 63-171          | -   | -    | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND            | 39.8     | 56.3     | 142          | -    | -         | -             | -    | 60-166          | -   | -    | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | ND            | 39.8     | 43.6     | 110          | -    | -         | -             | -    | 60-153          | -   | -    | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | ND            | 39.8     | 42.0     | 106          | -    | -         | -             | -    | 45-170          | -   | -    | 30         |
| Perfluorododecanoic Acid (PFDoA)  | ND            | 39.8     | 32.9     | 83           | -    | -         | -             | -    | 67-153          | -   | -    | 30         |
| Perfluorotridecanoic Acid (PFTiDA)  | ND            | 39.8     | 37.9     | 95           | -    | -         | -             | -    | 48-158          | -   | -    | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | ND            | 39.8     | 60.3     | 152          | -    | -         | -             | -    | 59-182          | -   | -    | 30         |

| Surrogate (Extracted Internal Standard)                                | MS         |           | MSD        |           | Acceptance Criteria |
|--|------------|-----------|------------|-----------|---------------------|
|  | % Recovery | Qualifier | % Recovery | Qualifier |                     |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 113        |           |            |           | 1-313               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5 NEIFOSAA)  | 47         |           |            |           | 23-146              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 40         |           |            |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 61         |           |            |           | 40-144              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 67         |           |            |           | 38-144              |



**Matrix Spike Analysis**  
Batch Quality Control

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

| Parameter  | Native Sample | MS Added  | MS Found   | MS %Recovery | Qual                | MSD Found | MSD %Recovery | Qual | Recovery Limits | RPD | Qual | RPD Limits |  |            |           |            |           |                     |  |    |  |  |  |        |   |    |  |  |  |        |  |     |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |     |  |  |  |        |
|--|---------------|-----------|------------|--------------|---------------------|-----------|---------------|------|-----------------|-----|------|------------|--|------------|-----------|------------|-----------|---------------------|--|----|--|--|--|--------|---|----|--|--|--|--------|--|-----|--|--|--|--------|---|----|--|--|--|--------|--|----|--|--|--|--------|---|----|--|--|--|--------|---------------------------------------|----|--|--|--|--------|---------------------------------------|----|--|--|--|--------|---|-----|--|--|--|--------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04,06,08-11 QC Batch ID: WG1391400-4 QC Sample: L2028496-02<br>Client ID: T5-W3  |               |           |            |              |                     |           |               |      |                 |     |      |            |  |            |           |            |           |                     |  |    |  |  |  |        |   |    |  |  |  |        |  |     |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |     |  |  |  |        |
| <b>Surrogate (Extracted Internal Standard)</b>   |               |           |            |              |                     |           |               |      |                 |     |      |            |  |            |           |            |           |                     |  |    |  |  |  |        |   |    |  |  |  |        |  |     |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |     |  |  |  |        |
| <table border="1"> <thead> <tr> <th></th> <th>% Recovery</th> <th>Qualifier</th> <th>% Recovery</th> <th>Qualifier</th> <th>Acceptance Criteria</th> </tr> </thead> <tbody> <tr> <td>Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)</td> <td>92</td> <td></td> <td></td> <td></td> <td>21-145</td> </tr> <tr> <td>Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)</td> <td>89</td> <td></td> <td></td> <td></td> <td>30-139</td> </tr> <tr> <td>Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)</td> <td>106</td> <td></td> <td></td> <td></td> <td>47-153</td> </tr> <tr> <td>Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)</td> <td>63</td> <td></td> <td></td> <td></td> <td>24-161</td> </tr> <tr> <td>Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)</td> <td>39</td> <td></td> <td></td> <td></td> <td>33-143</td> </tr> <tr> <td>Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)</td> <td>79</td> <td></td> <td></td> <td></td> <td>42-146</td> </tr> <tr> <td>Perfluoro[13C8]Octanoic Acid (M8PFOA)</td> <td>76</td> <td></td> <td></td> <td></td> <td>36-149</td> </tr> <tr> <td>Perfluoro[13C9]Nonanoic Acid (M9PFNA)</td> <td>73</td> <td></td> <td></td> <td></td> <td>34-146</td> </tr> <tr> <td>Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)</td> <td>121</td> <td></td> <td></td> <td></td> <td>31-159</td> </tr> </tbody> </table> |               |           |            |              |                     |           |               |      |                 |     |      |            |  | % Recovery | Qualifier | % Recovery | Qualifier | Acceptance Criteria | Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA) | 92 |  |  |  | 21-145 | Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA) | 89 |  |  |  | 30-139 | Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS) | 106 |  |  |  | 47-153 | Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA) | 63 |  |  |  | 24-161 | Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA) | 39 |  |  |  | 33-143 | Perfluoro[13C8]Octanesulfonic Acid (M8PFOS) | 79 |  |  |  | 42-146 | Perfluoro[13C8]Octanoic Acid (M8PFOA) | 76 |  |  |  | 36-149 | Perfluoro[13C9]Nonanoic Acid (M9PFNA) | 73 |  |  |  | 34-146 | Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS) | 121 |  |  |  | 31-159 |
|  | % Recovery    | Qualifier | % Recovery | Qualifier    | Acceptance Criteria |           |               |      |                 |     |      |            |  |            |           |            |           |                     |  |    |  |  |  |        |   |    |  |  |  |        |  |     |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |     |  |  |  |        |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 92            |           |            |              | 21-145              |           |               |      |                 |     |      |            |  |            |           |            |           |                     |  |    |  |  |  |        |   |    |  |  |  |        |  |     |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |     |  |  |  |        |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 89            |           |            |              | 30-139              |           |               |      |                 |     |      |            |  |            |           |            |           |                     |  |    |  |  |  |        |   |    |  |  |  |        |  |     |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |     |  |  |  |        |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)   | 106           |           |            |              | 47-153              |           |               |      |                 |     |      |            |  |            |           |            |           |                     |  |    |  |  |  |        |   |    |  |  |  |        |  |     |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |     |  |  |  |        |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 63            |           |            |              | 24-161              |           |               |      |                 |     |      |            |  |            |           |            |           |                     |  |    |  |  |  |        |   |    |  |  |  |        |  |     |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |     |  |  |  |        |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 39            |           |            |              | 33-143              |           |               |      |                 |     |      |            |  |            |           |            |           |                     |  |    |  |  |  |        |   |    |  |  |  |        |  |     |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |     |  |  |  |        |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 79            |           |            |              | 42-146              |           |               |      |                 |     |      |            |  |            |           |            |           |                     |  |    |  |  |  |        |   |    |  |  |  |        |  |     |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |     |  |  |  |        |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 76            |           |            |              | 36-149              |           |               |      |                 |     |      |            |  |            |           |            |           |                     |  |    |  |  |  |        |   |    |  |  |  |        |  |     |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |     |  |  |  |        |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 73            |           |            |              | 34-146              |           |               |      |                 |     |      |            |  |            |           |            |           |                     |  |    |  |  |  |        |   |    |  |  |  |        |  |     |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |     |  |  |  |        |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 121           |           |            |              | 31-159              |           |               |      |                 |     |      |            |  |            |           |            |           |                     |  |    |  |  |  |        |   |    |  |  |  |        |  |     |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |     |  |  |  |        |



Project Name: PFAS STUDY  
 Project Number: Not Specified

**Lab Duplicate Analysis**  
 Batch Quality Control

Lab Number: L2028496  
 Report Date: 08/06/20

| Parameter   | Native Sample | Duplicate Sample | Units | RPD | Qual | RPD Limits |
|---|---------------|------------------|-------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05,07 QC Batch ID: WG1391399-5 QC Sample: L2028496-07 Client ID: T2-W2 |               |                  |       |     |      |            |
| Perfluorooctanesulfonamide (FOSA)   | ND            | ND               | ng/l  | NC  |      | 30         |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | ND            | ND               | ng/l  | NC  |      | 30         |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | ND            | ND               | ng/l  | NC  |      | 30         |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)   | ND            | ND               | ng/l  | NC  |      | 30         |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEFOSE)   | ND            | ND               | ng/l  | NC  |      | 30         |

| Surrogate (Extracted Internal Standard)                               | %Recovery | Qualifier | %Recovery | Qualifier | Acceptance Criteria |
|---|-----------|-----------|-----------|-----------|---------------------|
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                             | 7         |           | 8         |           | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 9         | Q         | 11        | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEFOSA)                  | 7         | Q         | 8         | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 13        | Q         | 15        | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEFOSE)   | 6         | Q         | 6         | Q         | 50-150              |



Project Name: PFAS STUDY  
 Project Number: Not Specified

**Lab Duplicate Analysis**  
 Batch Quality Control

Lab Number: L2028496  
 Report Date: 08/06/20

| Parameter  | Native Sample | Duplicate Sample | Units | RPD | Qual | RPD Limits |
|--|---------------|------------------|-------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04,06,08-11 QC Batch ID: WG1391400-5 QC Sample: L2028496-03 Client ID: T5-W2 |               |                  |       |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)  | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorohexanoic Acid (PFHxA)   | 2.10          | 2.13             | ng/l  | 1   |      | 30         |
| Perfluoroheptanoic Acid (PFHpA)  | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorooctanoic Acid (PFOA)  | 2.12          | ND               | ng/l  | NC  |      | 30         |
| Perfluorononanoic Acid (PFNA)  | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)  | 1.99          | ND               | ng/l  | NC  |      | 30         |
| Perfluorodecanoic Acid (PFDA)  | ND            | ND               | ng/l  | NC  |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)  | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)   | ND            | ND               | ng/l  | NC  |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)  | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorododecanoic Acid (PFDoA)   | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorotridecanoic Acid (PFTriDA)  | ND            | ND               | ng/l  | NC  |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)   | ND            | ND               | ng/l  | NC  |      | 30         |

| Surrogate (Extracted Internal Standard)                        | %Recovery | Qualifier | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|-----------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)              | 112       |           | 118       |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS) | 102       |           | 102       |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)               | 93        |           | 94        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                | 99        |           | 92        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)             | 102       |           | 106       |           | 47-153              |



Project Name: PFAS STUDY  
Project Number: Not Specified

**Lab Duplicate Analysis**  
Batch Quality Control

Lab Number: L2028496  
Report Date: 08/06/20

| Parameter  | Native Sample | Duplicate Sample | Units | RPD | Qual | RPD Limits |
|--|---------------|------------------|-------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04,06,08-11 QC Batch ID: WG1391400-5 QC Sample: L2028496-03 Client ID: T5-W2 |               |                  |       |     |      |            |

| Surrogate (Extracted Internal Standard)                                | %Recovery | Qualifier | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|-----------|-----------|---------------------|
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 77        |           | 81        |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 70        |           | 71        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 76        |           | 77        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 68        |           | 67        |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 37        |           | 33        |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUOA)                | 58        |           | 56        |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NE[FOSAA]) | 41        |           | 50        |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 51        |           | 46        |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 32        | Q         | 44        |           | 33-143              |



Project Name: PFAS STUDY  
Project Number: Not Specified

**Lab Duplicate Analysis**  
Batch Quality Control

Lab Number: L2028496  
Report Date: 08/06/20

| Parameter  | Native Sample | Duplicate Sample | Units | RPD | Qual | RPD Limits |
|--|---------------|------------------|-------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04,06,08-11 QC Batch ID: WG1391400-5 QC Sample: L2028496-03 Client ID: T5-W2 |               |                  |       |     |      |            |

| Surrogate (Extracted Internal Standard)                                | %Recovery | Qualifier | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|-----------|-----------|---------------------|
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 77        |           | 81        |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 70        |           | 71        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 76        |           | 77        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 68        |           | 67        |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 37        |           | 33        |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUOA)                | 58        |           | 56        |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NE[FOSAA]) | 41        |           | 50        |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 51        |           | 46        |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 32        | Q         | 44        |           | 33-143              |



Project Name: PFAS STUDY  
 Project Number: Not Specified

Serial\_No:08062017.02  
 Lab Number: L2028496  
 Report Date: 08/06/20

**Sample Receipt and Container Information**

Were project specific reporting limits specified? YES

**Cooler Information**

Cooler                      Custody Seal  
 A                              Absent

**Container Information**

| Container ID | Container Type  | Cooler | Initial pH | Final pH | Temp deg C | Pres | Seal   | Frozen Date/Time | Analysis(*)            |
|--------------|---|--------|------------|----------|------------|------|--------|------------------|------------------------|
| L2028496-01A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |
| L2028496-02A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |
| L2028496-02B | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |
| L2028496-03A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |
| L2028496-03B | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |
| L2028496-04A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |
| L2028496-04B | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |
| L2028496-05A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE-36(14); |
| L2028496-06A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |
| L2028496-06B | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |
| L2028496-07A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE-36(14); |
| L2028496-07B | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE-36(14); |
| L2028496-08A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |
| L2028496-08B | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |
| L2028496-09A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |
| L2028496-10A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |
| L2028496-10B | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |
| L2028496-11A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |
| L2028496-11B | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |
| L2028496-12A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 4.5        | Y    | Absent |                  | A2-537-ISOTOPE(14)     |

\*Values in parentheses indicate holding time in days



Project Name: PFAS STUDY  
 Project Number:

Serial\_No:08062017.02  
 Lab Number: L2028496  
 Report Date: 08/06/20

**PFAS PARAMETER SUMMARY**

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



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

## GLOSSARY

### Acronyms

|                 |  |
|-----------------|--|
| <b>DL</b>       | - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  |
| <b>EDL</b>      | - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME)  |
| <b>EMPC</b>     | - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.   |
| <b>EPA</b>      | - Environmental Protection Agency.   |
| <b>LCS</b>      | - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.  |
| <b>LCSd</b>     | - Laboratory Control Sample Duplicate: Refer to LCS.   |
| <b>LIB</b>      | - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.   |
| <b>LOD</b>      | - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)   |
| <b>LOQ</b>      | - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)<br><br>Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) |
| <b>MDL</b>      | - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.  |
| <b>MS</b>       | - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 3320, the spike recovery is calculated using the native concentration, including estimated values.   |
| <b>MSD</b>      | - Matrix Spike Sample Duplicate: Refer to MS.  |
| <b>NA</b>       | - Not Applicable.  |
| <b>NC</b>       | - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.   |
| <b>NDPA/DPA</b> | - N-Nitrosodiphenylamine/Diphenylamine.  |
| <b>NI</b>       | - Not Identifiable.  |
| <b>NP</b>       | - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.  |
| <b>RI</b>       | - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RI includes any adjustments from dilutions, concentrations or moisture content, where applicable.   |
| <b>RPD</b>      | - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values, although the RPD value will be provided in the report.  |
| <b>SRM</b>      | - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.   |
| <b>STLP</b>     | - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.  |
| <b>TEF</b>      | - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.   |
| <b>TEQ</b>      | - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.  |
| <b>TIC</b>      | - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.  |

### Footnotes

**Report Format:** Data Usability Report





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

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

#### Terms

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1.8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

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

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

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 18 hours from sample collection, value will be reflected in **bold**.

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

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

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (S)' result is defined as the summation of results for: PFOA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

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

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

#### Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration. (DOD and NYSDEC Part 375 PFAS only.)
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP/CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration

Report Format: Data Usability Report



**Project Name:** PFAS STUDY

**Lab Number:** L2028496

**Project Number:** Not Specified

**Report Date:** 08/06/20

**Data Qualifiers**

Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only)

- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2028496  
**Report Date:** 08/06/20

#### REFERENCES

- 134 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) using Isotope Dilution. Alpha SOP 23528.

#### LIMITATION OF LIABILITIES

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

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



### Certification Information

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

**Westborough Facility**

**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene  
**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene, SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene.  
**EPA 8270D:** NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.  
**SM1500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

**Mansfield Facility**

**SM 2540D:** TSS  
**EPA 8082A:** NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.  
**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.  
**EPA TO-12** Non-methane organics  
**EPA 3C** Fixed gases  
**Biological Tissue Matrix:** EPA 3050B

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

**Westborough Facility:**

**Drinking Water**

**EPA 300.6:** Chloride, Nitrate-N, Fluoride, Sulfate, **EPA 353.2:** Nitrate-N, Nitrite-N, **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**  
**EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.  
**Microbiology:** **SM9215B, SM9223-P/A, SM9223B-Colilert-QT,SM9222D.**

**Non-Potable Water**

**SM4500H.B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LCHAT 10-107-06-1-B.** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2.** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.  
**EPA 624.1** Volatile Halocarbons & Aromatics,  
**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs  
**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil  
**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

**Mansfield Facility:**

**Drinking Water**

**EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**  
**EPA 522.**

**Non-Potable Water**

**EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.  
**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.  
**EPA 245.1 Hg.**  
**SM2340B**

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



ANALYTICAL REPORT

|                 |  |
|-----------------|--|
| Lab Number:     | L2032321   |
| Client:         | Maryland Department of the Environment<br>1800 Washington Boulevard<br>Baltimore, MD 21230 |
| ATTN:           | Amy Laliberte  |
| Phone:          | (410) 537-3614   |
| Project Name:   | PFAS STUDY   |
| Project Number: | Not Specified  |
| Report Date:    | 08/24/20   |

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

Certifications & Approvals: MA (M MA030), NH NELAP (2062), CT (PH 0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA0030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68 02089), RI (LA000299), TX (T104704419), VT (VT 0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330 17 00150), USFWS (Permit #206964).

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



Project Name: PFAS STUDY  
 Project Number: Not Specified

Lab Number: L2032321  
 Report Date: 08/24/20

| Alpha Sample ID | Client ID  | Matrix | Sample Location | Collection Date/Time | Receive Date |
|-----------------|------------|--------|-----------------|----------------------|--------------|
| L2032321-01     | TB101      | WATER  | Not Specified   | 08/10/20 06:00       | 08/10/20     |
| L2032321-02     | T1-01FB    | WATER  | Not Specified   | 08/10/20 09:00       | 08/10/20     |
| L2032321-03     | T1-01      | TISSUE | Not Specified   | 08/10/20 09:45       | 08/10/20     |
| L2032321-04     | T1-01L     | TISSUE | Not Specified   | 08/10/20 09:00       | 08/10/20     |
| L2032321-05     | FB-01      | TISSUE | Not Specified   | 08/10/20 10:20       | 08/10/20     |
| L2032321-06     | FB-01L     | TISSUE | Not Specified   | 08/10/20 10:20       | 08/10/20     |
| L2032321-07     | FB-01FB    | WATER  | Not Specified   | 08/10/20 10:20       | 08/10/20     |
| L2032321-08     | TB103      | WATER  | Not Specified   | 08/10/20 10:20       | 08/10/20     |
| L2032321-09     | TB100      | WATER  | Not Specified   | 08/10/20 06:00       | 08/10/20     |
| L2032321-10     | T5-01FB    | WATER  | Not Specified   | 08/10/20 08:45       | 08/10/20     |
| L2032321-11     | T5-01L     | TISSUE | Not Specified   | 08/10/20 09:05       | 08/10/20     |
| L2032321-12     | T5-01      | TISSUE | Not Specified   | 08/10/20 09:05       | 08/10/20     |
| L2032321-13     | T2-01FB    | WATER  | Not Specified   | 08/10/20 09:23       | 08/10/20     |
| L2032321-14     | T2-01      | TISSUE | Not Specified   | 08/10/20 09:30       | 08/10/20     |
| L2032321-15     | T2-01L     | TISSUE | Not Specified   | 08/10/20 09:30       | 08/10/20     |
| L2032321-16     | SC-01      | TISSUE | Not Specified   | 08/10/20 09:00       | 08/10/20     |
| L2032321-17     | SC-01L     | TISSUE | Not Specified   | 08/10/20 09:00       | 08/10/20     |
| L2032321-18     | WFWWTP-01  | TISSUE | Not Specified   | 08/10/20 10:15       | 08/10/20     |
| L2032321-19     | WFWWTP-01L | TISSUE | Not Specified   | 08/10/20 10:15       | 08/10/20     |
| L2032321-20     | CC-01      | TISSUE | Not Specified   | 08/10/20 09:45       | 08/10/20     |
| L2032321-21     | CC-01L     | TISSUE | Not Specified   | 08/10/20 09:45       | 08/10/20     |
| L2032321-22     | SRM        | TISSUE | Not Specified   | 08/10/20 09:45       | 08/10/20     |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

### Case Narrative

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

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

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

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

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

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

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**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**Case Narrative (continued)**

**Sample Receipt**

L2032321-04: The sample identified as "T1-01L" on the chain of custody was identified as "T1-01" on the container label. At the client's request, the sample is reported as "T1-01L".

**Perfluorinated Alkyl Acids by Isotope Dilution**

L2032321-03, -04, -05, -06, -11, -12, -14, -15, -16, -17, -18, -19, -20, -21, and -22: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

WG1398959-1, -2, -3, -4, -5 and WG1401095-1, -2, -3, -4, -5: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

The WG1401095-2 LCS recovery, associated with L2032321-05, -06, -11, and -12, is above the acceptance criteria for 1h,1h,2h,2h-perfluorododecanesulfonic acid (10:2fts) (201%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

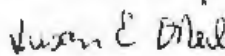
The WG1401095-3 LCSD recoveries, associated with L2032321-05, -06, -11, and -12, are above the acceptance criteria for 1h,1h,2h,2h-perfluorododecanesulfonic acid (10:2fts) (175%), n-methyl perfluorooctanesulfonamido ethanol (nmefose) (183%) and n-ethyl perfluorooctanesulfonamido ethanol (netfose) (189%); however, the associated samples are non-detect to the RL for these target analytes. The results of the original analysis are reported.

The WG1401095-2/-3 LCS/LCSD RPD(s), associated with L2032321-05, -06, -11, and -12, are above the acceptance criteria for n-methyl perfluorooctane sulfonamide (nmefosa) (42%) and n-ethyl perfluorooctane sulfonamide (netfosa) (34%).

The WG1398959-4 MS recoveries, performed on L2032321-17, are outside the acceptance criteria for perfluorooctanoic acid, perfluorododecanoic acid (pfdoa) (139%) and perfluorotridecanoic acid (pftdda) (143%).

The WG1401095-4 MS recoveries, performed on L2032321-05, are outside the acceptance criteria for 1h,1h,2h,2h-perfluorododecanesulfonic acid (10:2fts) (159%), n-methyl perfluorooctanesulfonamido ethanol (nmefose) (151%) and n-ethyl perfluorooctanesulfonamido ethanol (netfose) (241%).

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

Authorized Signature:  Susan O'Neil

Title: Technical Director/Representative

Date: 08/24/20





# ORGANICS



# SEMIVOLATILES



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-03  
**Client ID:** T1-01  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 09:45  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/15/20 21:36  
**Analyst:** SG  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/14/20 14:20

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/g  | 0.946 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.946 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/g  | 0.946 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/g  | 0.946 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.946 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.946 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/g  | 0.946 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.946 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/g  | 0.946 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/g  | 0.946 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/g  | 0.946 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/g  | 0.946 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/g  | 0.946 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/g  | 0.946 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

Lab ID: L2032321-03  
 Client ID: T1-01  
 Sample Location: Not Specified

Date Collected: 08/10/20 09:45  
 Date Received: 08/10/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 56         | O         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 102        |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 48         | O         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 56         | O         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 63         |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 50         | O         | 62-152              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 54         | O         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 61         | O         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 52         | O         | 65-150              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 82         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 59         | O         | 64-158              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 87         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 51         | O         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 50         |           | 26-160              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-04  
**Client ID:** T1-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 09:00  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/15/20 21:52  
**Analyst:** SG  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/14/20 14:20

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/g  | 0.909 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.909 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/g  | 0.909 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/g  | 0.909 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.909 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.909 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/g  | 0.909 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.909 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/g  | 0.909 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/g  | 0.909 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/g  | 0.909 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/g  | 0.909 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/g  | 0.909 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/g  | 0.909 | --  | 1               |



Serial\_No:08242013;24

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

Lab ID: L2032321-04  
 Client ID: T1-01L  
 Sample Location: Not Specified

Date Collected: 08/10/20 09:00  
 Date Received: 08/10/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 54         | O         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 69         |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 42         | O         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 50         | O         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 61         | O         | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PF OA)                                 | 46         | O         | 62-152              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 42         | O         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 57         | O         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 47         | O         | 65-150              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 64         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 53         | O         | 64-158              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 75         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 46         | O         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 47         |           | 26-160              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-05  
**Client ID:** FB-01  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 10:20  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/22/20 03:26  
**Analyst:** JW  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/20/20 14:15

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |       |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/g  | 0.952 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.952 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.952 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/g  | 0.952 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/g  | 0.952 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                          | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)   | ND     |           | ng/g  | 0.952 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/g  | 9.52  | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/g  | 0.952 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/g  | 1.90  | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

Lab ID: L2032321-05  
 Client ID: FB-01  
 Sample Location: Not Specified

Date Collected: 08/10/20 10:20  
 Date Received: 08/10/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/g  | 1.90  | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/g  | 0.952 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/g  | 0.952 | -   | 1               |
| 9-Chlorohexadecafluoro-3-Oxaone-1-Sulfonic Acid (9Cl-PF3ONS)          | ND     |           | ng/g  | 0.952 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/g  | 0.952 | -   | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/g  | 0.952 | -   | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/g  | 0.952 | -   | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/g  | 1.90  | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/g  | 1.90  | -   | 1               |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-05  
**Client ID:** FB-01  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 10:20  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 54         | Q         | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 58         | Q         | 65-182              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 62         | Q         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 157        | Q         | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 53         | Q         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 56         | Q         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 65         |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 55         | Q         | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 155        |           | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 57         | Q         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 60         | Q         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 55         | Q         | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 229        | Q         | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 83         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                 | 55         | Q         | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 19         |           | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                    | 94         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 49         | Q         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 43         |           | 26-160              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 90         |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 39         | Q         | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 6          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                    | 6          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 14         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                     | 7          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-06  
**Client ID:** FB-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 10:20  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

**Sample Depth:**

**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/22/20 03:59  
**Analyst:** JW  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/20/20 14:15

| Parameter  | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|--|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>              |        |           |       |       |     |                 |
| Perfluorobutanoic Acid (PFBA)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                  | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)   | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                  | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorononanoic Acid (PFNA)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                  | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                          | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)   | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                           | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)   | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoro(propoxy)-Propanoic Acid (HFPO-DA) | ND     |           | ng/g  | 9.24  | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)  | ND     |           | ng/g  | 1.85  | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

Lab ID: L2032321-06  
 Client ID: FB-01L  
 Sample Location: Not Specified

Date Collected: 08/10/20 10:20  
 Date Received: 08/10/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/g  | 1.85  | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/g  | 0.924 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/g  | 0.924 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxaone-1-Sulfonic Acid (9Cl-PF3ONS)          | ND     |           | ng/g  | 0.924 | -   | 1               |
| 11-Chloroicosafafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)   | ND     |           | ng/g  | 0.924 | --  | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/g  | 0.924 | -   | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/g  | 0.924 | -   | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/g  | 1.85  | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/g  | 1.85  | -   | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-06  
**Client ID:** FB-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 10:20  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 52         | O         | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 55         | O         | 65-182              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 61         | O         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 137        |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 48         | Q         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 52         | Q         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 64         |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 50         | Q         | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 162        |           | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 51         | O         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 59         | O         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 52         | O         | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 216        | O         | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 76         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                 | 54         | O         | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 16         |           | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                    | 86         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 47         | Q         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 43         |           | 26-160              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 86         |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 38         | O         | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 4          | O         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                    | 3          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 9          | O         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                     | 5          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-11  
**Client ID:** T5-O1L  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 09:05  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/22/20 04:32  
**Analyst:** JW  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/20/20 14:15

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |       |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/g  | 0.930 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.930 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.930 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/g  | 0.930 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/g  | 0.930 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                          | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)   | ND     |           | ng/g  | 0.930 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/g  | 9.30  | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/g  | 0.930 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/g  | 1.86  | --  | 1               |



Serial\_No:08242013;24

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

Lab ID: L2032321-11  
 Client ID: T5 O1L  
 Sample Location: Not Specified

Date Collected: 08/10/20 09:05  
 Date Received: 08/10/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/g  | 1.86  | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/g  | 0.930 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/g  | 0.930 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)       | ND     |           | ng/g  | 0.930 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/g  | 0.930 | --  | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/g  | 0.930 | -   | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/g  | 0.930 | -   | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/g  | 1.86  | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/g  | 1.86  | -   | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-11  
**Client ID:** T5-O1L  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 09:05  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 56         | Q         | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 61         | Q         | 65-182              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 65         | Q         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 140        | Q         | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 56         | Q         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 59         | Q         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 69         |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 56         | Q         | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 154        |           | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 61         |           | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 59         | Q         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 55         | Q         | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 253        | Q         | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 89         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                 | 56         | Q         | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 20         |           | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                    | 99         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 51         | Q         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 45         |           | 26-160              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 87         |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 39         | Q         | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 5          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                    | 5          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 10         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                     | 4          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-12  
**Client ID:** T5-01  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 09:05  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/22/20 04:48  
**Analyst:** JW  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/20/20 14:15

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |       |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/g  | 0.934 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.934 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.934 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/g  | 0.934 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/g  | 0.934 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                          | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)   | ND     |           | ng/g  | 0.934 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/g  | 9.34  | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/g  | 0.934 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/g  | 1.87  | --  | 1               |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

Lab ID: L2032321-12  
 Client ID: T5 01  
 Sample Location: Not Specified

Date Collected: 08/10/20 09:05  
 Date Received: 08/10/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/g  | 1.87  | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/g  | 0.934 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/g  | 0.934 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)       | ND     |           | ng/g  | 0.934 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/g  | 0.934 | --  | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/g  | 0.934 | -   | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/g  | 0.934 | -   | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/g  | 1.87  | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/g  | 1.87  | -   | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-12  
**Client ID:** T5-01  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 09:05  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 55         | Q         | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 58         | Q         | 65-182              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 59         | Q         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 150        | Q         | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 55         | Q         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 57         | Q         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 62         | Q         | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 54         | Q         | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 151        |           | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 58         | Q         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 57         | Q         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 52         | Q         | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 191        | Q         | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 93         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                 | 58         | Q         | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 23         |           | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                    | 95         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 51         | Q         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 44         |           | 26-160              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 83         |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 38         | Q         | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 7          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                    | 8          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 13         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                     | 7          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-14  
**Client ID:** T2-01  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 09:30  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/15/20 22:09  
**Analyst:** SG  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/14/20 14:20

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.984 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/g  | 0.984 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/g  | 0.964 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/g  | 0.964 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

Lab ID: L2032321-14  
 Client ID: T2-01  
 Sample Location: Not Specified

Date Collected: 08/10/20 09:30  
 Date Received: 08/10/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 62         | O         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 97         |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 48         | O         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 57         | O         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 68         |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 52         | O         | 62-152              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 54         | O         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 67         |           | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 58         | O         | 65-150              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 79         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 66         |           | 64-158              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 100        |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 57         |           | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 54         |           | 26-160              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-15  
**Client ID:** T2-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 09:30  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/15/20 22:25  
**Analyst:** SG  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/14/20 14:20

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/g  | 0.943 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/g  | 0.943 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

Lab ID: L2032321-15  
 Client ID: T2-01L  
 Sample Location: Not Specified

Date Collected: 08/10/20 09:30  
 Date Received: 08/10/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 53         | O         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 72         |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 43         | O         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 50         | O         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 58         | O         | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 46         | O         | 62-152              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 48         | O         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 56         | O         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 50         | O         | 65-150              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 86         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 56         | O         | 64-158              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 92         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 48         | O         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 47         |           | 26-160              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-16  
**Client ID:** SC-01  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 09:00  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/15/20 22:42  
**Analyst:** SG  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/14/20 14:20

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/g  | 0.917 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.917 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/g  | 0.917 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/g  | 0.917 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.917 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.917 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/g  | 0.917 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.917 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/g  | 0.917 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/g  | 0.917 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/g  | 0.917 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/g  | 0.917 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/g  | 0.917 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/g  | 0.917 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

Lab ID: L2032321-16  
 Client ID: SC-01  
 Sample Location: Not Specified

Date Collected: 08/10/20 09:00  
 Date Received: 08/10/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 56         | O         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 85         |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 46         | O         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 54         | O         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 62         | O         | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PF OA)                                 | 48         | O         | 62-152              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 50         | O         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 59         | O         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 53         | O         | 65-150              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 96         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 59         | O         | 64-158              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 101        |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 51         | O         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 49         |           | 26-160              |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-17  
**Client ID:** SC-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 09:00  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/15/20 22:58  
**Analyst:** SG  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/14/20 14:20

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/g  | 0.962 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.962 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/g  | 0.962 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/g  | 0.962 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.962 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.962 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/g  | 0.962 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.962 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/g  | 0.962 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/g  | 0.962 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/g  | 0.962 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/g  | 0.962 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/g  | 0.962 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/g  | 0.962 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

Lab ID: L2032321-17  
 Client ID: SC-01L  
 Sample Location: Not Specified

Date Collected: 08/10/20 09:00  
 Date Received: 08/10/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 56         | O         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 66         |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 44         | O         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 53         | O         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 63         |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 50         | O         | 62-152              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 50         | O         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 61         | O         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 53         | O         | 65-150              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 82         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 58         | O         | 64-158              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 84         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 49         | O         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 48         |           | 26-160              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-18  
**Client ID:** WFWWTP-01  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 10:15  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/15/20 23:31  
**Analyst:** SG  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/14/20 14:20

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.950 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/g  | 0.950 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/g  | 0.950 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

Lab ID: L2032321-18  
 Client ID: WFWWTP-01  
 Sample Location: Not Specified

Date Collected: 08/10/20 10:15  
 Date Received: 08/10/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 56         | O         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 75         |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 45         | O         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 53         | O         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 63         |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 50         | O         | 62-152              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 51         | O         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 62         | O         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 53         | O         | 65-150              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 84         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 60         | O         | 64-158              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 95         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 51         | O         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 49         |           | 26-160              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-19  
**Client ID:** WFWWTP-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 10:15  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/15/20 23:48  
**Analyst:** SG  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/14/20 14:20

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.984 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/g  | 0.984 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/g  | 0.964 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/g  | 0.964 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

Lab ID: L2032321-19  
 Client ID: WFWWTP-01L  
 Sample Location: Not Specified

Date Collected: 08/10/20 10:15  
 Date Received: 08/10/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 54         | O         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 71         |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 42         | O         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 50         | O         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 59         | Q         | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PF OA)                                 | 48         | Q         | 62-152              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 46         | Q         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 59         | Q         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 51         | O         | 65-150              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 77         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 57         | O         | 64-158              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 86         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 48         | O         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 47         |           | 26-160              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-20  
**Client ID:** CC-01  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 09:45  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/16/20 00:21  
**Analyst:** SG  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/14/20 14:20

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/g  | 0.901 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/g  | 0.901 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-20  
**Client ID:** CC-01  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 09:45  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 54         | O         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 80         |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 41         | O         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 49         | O         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 60         | Q         | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 47         | Q         | 62-152              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 45         | Q         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 58         | Q         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 50         | O         | 65-150              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 94         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 57         | O         | 64-158              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 88         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 48         | O         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 47         |           | 26-160              |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-21  
**Client ID:** CC-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 09:45  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/16/20 02:34  
**Analyst:** SG  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/14/20 14:20

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/g  | 0.926 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.926 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/g  | 0.926 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/g  | 0.926 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.926 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.926 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/g  | 0.926 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.926 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/g  | 0.926 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/g  | 0.926 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/g  | 0.926 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/g  | 0.926 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/g  | 0.926 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/g  | 0.926 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

Lab ID: L2032321-21  
 Client ID: CC-01L  
 Sample Location: Not Specified

Date Collected: 08/10/20 09:45  
 Date Received: 08/10/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 56         | O         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 79         |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 47         | O         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 55         | O         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 62         | O         | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 51         | O         | 62-152              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 51         | O         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 62         | O         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 54         | O         | 65-150              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 100        |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 61         | O         | 64-158              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 101        |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 49         | O         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 50         |           | 26-160              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

**Lab ID:** L2032321-22  
**Client ID:** SRM  
**Sample Location:** Not Specified

**Date Collected:** 08/10/20 09:45  
**Date Received:** 08/10/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/16/20 02:50  
**Analyst:** SG  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/14/20 14:20

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/g  | 0.924 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                     | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)                                 | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorohexanoic Acid (PFHpA)  | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | 3.81   | F         | ng/g  | 0.924 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.924 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/g  | 0.924 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)              | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/g  | 0.924 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/g  | 0.924 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**SAMPLE RESULTS**

Lab ID: L2032321-22  
 Client ID: SRM  
 Sample Location: Not Specified

Date Collected: 08/10/20 09:45  
 Date Received: 08/10/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 60         | O         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 131        |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 50         | O         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 59         | O         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 68         |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 58         | O         | 62-152              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 55         | O         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 65         |           | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 62         | O         | 65-150              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 111        |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 61         | O         | 64-158              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 129        |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 53         | O         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 53         |           | 26-160              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 08/15/20 20:46  
 Analyst: SG

Extraction Method: ALPHA 23528  
 Extraction Date: 08/14/20 14:20

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 03-04,14-22 Batch: WG1398959-1</b> |        |           |       |      |     |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/g  | 1.00 | --  |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 1.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/g  | 1.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/g  | 1.00 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**Method Blank Analysis  
 Batch Quality Control**

**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/15/20 20:46  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/14/20 14:20

| Parameter  | Result | Qualifier | Units | RL | MDL |
|--|--------|-----------|-------|----|-----|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 03-04,14-22 Batch: WG1398959-1 |        |           |       |    |     |

| Surrogate (Extracted Internal Standard)                                | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 79        |           | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 177       | Q         | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 64        |           | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 74        |           | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 84        |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 73        |           | 62-152              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 67        |           | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 86        |           | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 79        |           | 65-150              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 119       |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 87        |           | 64-158              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 142       | Q         | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 73        |           | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 74        |           | 26-160              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**Method Blank Analysis**  
**Batch Quality Control**

Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 08/22/20 02:36  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 08/20/20 14:15

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 05-06,11-12 Batch: WG1401095-1</b> |        |           |       |      |     |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/g  | 1.00 | --  |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 1.00 | --  |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 1.00 | --  |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/g  | 1.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/g  | 1.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/g  | 1.00 | --  |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy] Propanoic Acid (HFPO-DA)                                   | ND     |           | ng/g  | 10.0 | --  |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)   | ND     |           | ng/g  | 1.00 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**Method Blank Analysis  
 Batch Quality Control**

**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/22/20 02:36  
**Analyst:** JW

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/20/20 14:15

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 05-06,11-12 Batch: WG1401095-1</b> |        |           |       |      |     |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/g  | 2.00 | --  |
| Perfluorooctadecanoic Acid (PFODA)  | ND     |           | ng/g  | 2.00 | --  |
| Perfluorododecane Sulfonic Acid (PFDoDS)  | ND     |           | ng/g  | 1.00 | --  |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)  | ND     |           | ng/g  | 1.00 | --  |
| 9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)   | ND     |           | ng/g  | 1.00 | --  |
| 11-Chloroicosaffluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)  | ND     |           | ng/g  | 1.00 | --  |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | ND     |           | ng/g  | 1.00 | --  |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)   | ND     |           | ng/g  | 1.00 | --  |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)   | ND     |           | ng/g  | 2.00 | --  |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)  | ND     |           | ng/g  | 2.00 | --  |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**Method Blank Analysis  
 Batch Quality Control**

**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/22/20 02:36  
**Analyst:** JW

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/20/20 14:15

| Parameter  | Result | Qualifier | Units | RL | MDL |
|--|--------|-----------|-------|----|-----|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 05-06,11-12 Batch: WG1401095-1 |        |           |       |    |     |

| Surrogate (Extracted Internal Standard)  | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 73        |           | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 82        |           | 65-182              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 80        |           | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 297       | Q         | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 66        |           | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 71        |           | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 84        |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 73        |           | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 299       | Q         | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 71        |           | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 80        |           | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 72        |           | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 353       | Q         | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 143       | Q         | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                 | 69        |           | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 51        |           | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 140       | Q         | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 59        |           | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 59        |           | 26-160              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 89        |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 68        |           | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 5         | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                                    | 5         | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 10        | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)                     | 7         | Q         | 50-150              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032321  
Report Date: 08/24/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 03-04,14-22 Batch: WG1398959-2 WG1398959-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)   | 110       |      | 113       |      | 72-128           | 3   |      | 30         |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | 108       |      | 109       |      | 62-145           | 3   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 114       |      | 113       |      | 70-132           | 1   |      | 30         |
| Perfluoropentanesulfonic Acid (PFPeS)   | 100       |      | 103       |      | 73-123           | 3   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 110       |      | 112       |      | 71-131           | 2   |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | 110       |      | 112       |      | 67-130           | 2   |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 116       |      | 118       |      | 69-133           | 2   |      | 30         |
| Perfluorononanoic Acid (PFNA)   | 110       |      | 114       |      | 72-129           | 4   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 110       |      | 115       |      | 68-136           | 4   |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | 112       |      | 110       |      | 69-133           | 2   |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | 104       |      | 112       |      | 63-144           | 7   |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | 104       |      | 108       |      | 64-136           | 4   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)  | 102       |      | 108       |      | 61-139           | 1   |      | 30         |
| Perfluorododecanoic Acid (PFDDA)  | 125       |      | 127       |      | 69-135           | 2   |      | 30         |
| Perfluorotridecanoic Acid (PFTTDA)  | 122       |      | 122       |      | 66-139           | 0   |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | 91        |      | 93        |      | 69-133           | 2   |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032321  
Report Date: 08/24/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits    | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|---------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                     |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 03-04,14-22 Batch: WG1398959-2 WG1398959-3 |           |      |           |      |                     |     |      |            |
| Surrogate (Extracted Internal Standard)   | LCS       |      | LCSD      |      | Acceptance Criteria |     |      |            |
|   | %Recovery | Qual | %Recovery | Qual |                     |     |      |            |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)   | 77        |      | 76        |      | 70-151              |     |      |            |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)  | 150       | Q    | 172       | Q    | 56-138              |     |      |            |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)  | 61        |      | 60        | Q    | 61-147              |     |      |            |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)   | 70        |      | 70        |      | 62-149              |     |      |            |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)  | 83        |      | 81        |      | 63-166              |     |      |            |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)   | 71        |      | 71        |      | 62-152              |     |      |            |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)   | 65        |      | 65        |      | 61-154              |     |      |            |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)   | 81        |      | 80        |      | 65-151              |     |      |            |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)   | 76        |      | 77        |      | 65-150              |     |      |            |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)  | 138       |      | 128       |      | 45-137              |     |      |            |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)   | 80        |      | 80        |      | 64-158              |     |      |            |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 140       | Q    | 143       | Q    | 42-136              |     |      |            |
| Perfluoro[1,2-13C2]Dodecanoic Acid (M2PFDDA)  | 68        |      | 69        |      | 56-148              |     |      |            |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)  | 72        |      | 73        |      | 26-160              |     |      |            |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032321  
Report Date: 08/24/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-06,11-12 Batch: WG1401095-2 WG1401095-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanoic Acid (PFBA)   | 119       |      | 101       |      | 71-135           | 16  |      | 30         |
| Perfluoropentanoic Acid (PFPeA)   | 125       |      | 105       |      | 59-132           | 17  |      | 30         |
| Perfluorobutanesulfonic Acid (PFBS)   | 123       |      | 109       |      | 72-128           | 12  |      | 30         |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | 125       |      | 109       |      | 62-145           | 14  |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 124       |      | 105       |      | 70-132           | 17  |      | 30         |
| Perfluoropentanesulfonic Acid (PFPeS)   | 114       |      | 97        |      | 73-123           | 16  |      | 30         |
| Perfluorohexanoic Acid (PFHpA)  | 123       |      | 104       |      | 71-131           | 17  |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | 120       |      | 99        |      | 67-130           | 19  |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 121       |      | 107       |      | 69-133           | 12  |      | 30         |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (8:2FTS)   | 125       |      | 103       |      | 64-140           | 19  |      | 30         |
| Perfluorooptanesulfonic Acid (PFHpS)  | 124       |      | 107       |      | 70-132           | 15  |      | 30         |
| Perfluorononanoic Acid (PFNA)   | 119       |      | 105       |      | 72-129           | 13  |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 119       |      | 108       |      | 68-136           | 10  |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | 121       |      | 103       |      | 69-133           | 16  |      | 30         |
| 1H,1H,2H,2H-Perfluorodecane sulfonic Acid (8:2FTS)  | 130       |      | 109       |      | 65-137           | 16  |      | 30         |
| Perfluorononanesulfonic Acid (PFNS)   | 125       |      | 110       |      | 69-125           | 13  |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | 138       |      | 110       |      | 63-144           | 23  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | 119       |      | 100       |      | 64-136           | 17  |      | 30         |
| Perfluorodecane sulfonic Acid (PFDS)  | 128       |      | 103       |      | 59-134           | 20  |      | 30         |
| Perfluorooctanesulfonamide (FOSA)   | 129       |      | 106       |      | 67-137           | 16  |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | 115       |      | 94        |      | 61-139           | 20  |      | 30         |
| Perfluorododecanoic Acid (PFDoA)  | 128       |      | 107       |      | 69-135           | 16  |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032321  
Report Date: 08/24/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-06,11-12 Batch: WG1401095-2 WG1401095-3 |           |      |           |      |                  |     |      |            |
| Perfluorotridecanoic Acid (PFTrDA)  | 115       |      | 98        |      | 66-139           | 16  |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | 110       |      | 96        |      | 68-133           | 14  |      | 30         |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Hexafluoroisopropoxy]-Propanoic Acid (HFPO-DA)   | 112       |      | 94        |      | 50-150           | 17  |      | 30         |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)   | 113       |      | 100       |      | 50-150           | 12  |      | 30         |
| Perfluorohexadecanoic Acid (PFHxDA)   | 89        |      | 75        |      | 50-150           | 17  |      | 30         |
| Perfluorooctadecanoic Acid (PFODA)  | 81        |      | 64        |      | 50-150           | 23  |      | 30         |
| Perfluorododecane Sulfonic Acid (PFDS)  | 131       |      | 114       |      | 50-150           | 14  |      | 30         |
| 1H,1H,2H,2H-Perfluorododecane sulfonic Acid (10:2FTS)   | 201       | Q    | 175       | Q    | 50-150           | 14  |      | 30         |
| 9-Chlorohexadecafluoro-3-Oxanon-1-Sulfonic Acid (9Cl-PF3ONS)  | 102       |      | 93        |      | 50-150           | 9   |      | 30         |
| 11-Chlorooctadecafluoro-3-Oxandecane-1-Sulfonic Acid (11Cl-PF3ONS)  | 64        |      | 81        |      | 50-150           | 4   |      | 30         |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | 60        |      | 122       |      | 50-150           | 42  | Q    | 30         |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | 105       |      | 148       |      | 50-150           | 34  | Q    | 30         |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)   | 135       |      | 163       | Q    | 50-150           | 30  |      | 30         |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEFOSE)   | 133       |      | 166       | Q    | 50-150           | 23  |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032321  
Report Date: 08/24/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | RPD  |        |
|---|-----------|------|-----------|------|------------------|-----|------|--------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     | Qual | Limits |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-06,11-12 Batch: WG1401095-2 WG1401095-3 |           |      |           |      |                  |     |      |        |

| Surrogate (Extracted Internal Standard)  | LCS       |      | LCSD      |      | Acceptance Criteria |
|--|-----------|------|-----------|------|---------------------|
|  | %Recovery | Qual | %Recovery | Qual |                     |
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 66        |      | 81        |      | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 75        |      | 91        |      | 65-192              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 74        |      | 86        |      | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 292       | Q    | 343       | Q    | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 62        |      | 74        |      | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 65        |      | 79        |      | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 76        |      | 89        |      | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFDA)  | 68        |      | 80        |      | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 289       | Q    | 332       | Q    | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 66        |      | 78        |      | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 73        |      | 84        |      | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 66        |      | 80        |      | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 354       | Q    | 410       | Q    | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 109       |      | 141       | Q    | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 92        | Q    | 77        |      | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 47        |      | 56        |      | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                    | 132       |      | 161       | Q    | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (M2PFDOA)   | 57        |      | 66        |      | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEA)  | 53        |      | 62        |      | 26-180              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 79        |      | 90        |      | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 61        |      | 75        |      | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 7         | Q    | 6         | Q    | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                    | 5         | Q    | 5         | Q    | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 12        | Q    | 13        | Q    | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                     | 8         | Q    | 8         | Q    | 50-150              |



**Matrix Spike Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032321  
Report Date: 08/24/20

| Parameter  | Native Sample | MS Added | MS Found | MS        |      | MSD   |           | Recovery Limits | RPD | Qual | RPD |
|--|---------------|----------|----------|-----------|------|-------|-----------|-----------------|-----|------|-----|
|  |               |          |          | %Recovery | Qual | Found | %Recovery |                 |     |      |     |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 03-04,14-22 QC Batch ID: WG1398959-4 QC Sample: L2032321-17 Client ID: SC-01L |               |          |          |           |      |       |           |                 |     |      |     |
| Perfluorobutanesulfonic Acid (PFBS)  | ND            | 4.2      | 4.98     | 119       |      | -     | -         | 72-128          | -   |      | 30  |
| Perfluorohexanoic Acid (PFHxA)   | ND            | 4.73     | 5.74     | 121       |      | -     | -         | 70-132          | -   |      | 30  |
| Perfluoroheptanoic Acid (PFHpA)  | ND            | 4.73     | 5.66     | 120       |      | -     | -         | 71-131          | -   |      | 30  |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND            | 4.32     | 5.02     | 116       |      | -     | -         | 67-130          | -   |      | 30  |
| Perfluorooctanoic Acid (PFOA)  | ND            | 4.73     | 5.94     | 126       |      | -     | -         | 69-133          | -   |      | 30  |
| Perfluorononanoic Acid (PFNA)  | ND            | 4.73     | 5.89     | 125       |      | -     | -         | 72-129          | -   |      | 30  |
| Perfluorooctanesulfonic Acid (PFOS)  | ND            | 4.39     | 5.18     | 118       |      | -     | -         | 68-136          | -   |      | 30  |
| Perfluorodecanoic Acid (PFDA)  | ND            | 4.73     | 5.62     | 119       |      | -     | -         | 69-133          | -   |      | 30  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)  | ND            | 4.73     | 6.06     | 120       |      | -     | -         | 63-144          | -   |      | 30  |
| Perfluoroundecanoic Acid (PFUnA)   | ND            | 4.73     | 5.35     | 113       |      | -     | -         | 64-136          | -   |      | 30  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)  | ND            | 4.73     | 6.04     | 128       |      | -     | -         | 61-139          | -   |      | 30  |
| Perfluorododecanoic Acid (PFDoA)   | ND            | 4.73     | 6.57     | 139       | Q    | -     | -         | 69-135          | -   |      | 30  |
| Perfluorotetradecanoic Acid (PFTDA)  | ND            | 4.73     | 6.78     | 143       | Q    | -     | -         | 66-139          | -   |      | 30  |
| Perfluorotetradecanoic Acid (PFTA)   | ND            | 4.73     | 4.58     | 97        |      | -     | -         | 69-133          | -   |      | 30  |

| Surrogate (Extracted Internal Standard)                                | MS         |           | MSD        |           | Acceptance Criteria |
|--|------------|-----------|------------|-----------|---------------------|
|  | % Recovery | Qualifier | % Recovery | Qualifier |                     |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)         | 65         |           |            |           | 56-138              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)  | 85         |           |            |           | 42-136              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 85         |           |            |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 58         | Q         |            |           | 64-158              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 51         | Q         |            |           | 65-150              |



**Matrix Spike Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032321  
Report Date: 08/24/20

| Parameter  | Native Sample | MS Added | MS Found      | MS %Recovery | Qual | MSD Found | MSD %Recovery  | Qual      | Recovery Limits     | RPD | Qual | RPD Limits |
|--|---------------|----------|---------------|--------------|------|-----------|----------------|-----------|---------------------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 03-04,14-22 QC Batch ID: WG1398959-4 QC Sample: L2032321-17 Client ID: SC-01L |               |          |               |              |      |           |                |           |                     |     |      |            |
| Surrogate (Extracted Internal Standard)  |               |          | MS % Recovery | Qualifier    |      |           | MSD % Recovery | Qualifier | Acceptance Criteria |     |      |            |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   |               |          | 43            | Q            |      |           |                |           | 61-147              |     |      |            |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  |               |          | 51            | O            |      |           |                |           | 62-149              |     |      |            |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)   |               |          | 58            | O            |      |           |                |           | 63-166              |     |      |            |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  |               |          | 47            | O            |      |           |                |           | 56-148              |     |      |            |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   |               |          | 48            |              |      |           |                |           | 26-180              |     |      |            |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  |               |          | 56            | O            |      |           |                |           | 85-151              |     |      |            |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  |               |          | 48            | O            |      |           |                |           | 62-152              |     |      |            |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  |               |          | 46            | O            |      |           |                |           | 61-154              |     |      |            |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  |               |          | 53            | Q            |      |           |                |           | 70-151              |     |      |            |



**Matrix Spike Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032321  
Report Date: 08/24/20

| Parameter   | Native Sample | MS Added | MS Found | MS %Recovery | Qual | MSD Found | MSD %Recovery | Qual | Recovery Limits | RPD | Qual | RPD Limits |
|---|---------------|----------|----------|--------------|------|-----------|---------------|------|-----------------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-06,11-12 QC Batch ID: WG1401095-4 QC Sample: L2032321-05 Client ID: FB-01 |               |          |          |              |      |           |               |      |                 |     |      |            |
| Perfluorobutanoic Acid (PFBA)   | ND            | 4.81     | 4.55     | 85           |      | -         | -             |      | 71-135          | -   |      | 30         |
| Perfluoropentanoic Acid (PFPeA)   | ND            | 4.81     | 4.88     | 102          |      | -         | -             |      | 69-132          | -   |      | 30         |
| Perfluorobutanesulfonic Acid (PFBS)   | ND            | 4.27     | 4.38     | 103          |      | -         | -             |      | 72-128          | -   |      | 30         |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | ND            | 4.5      | 4.44     | 99           |      | -         | -             |      | 62-145          | -   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | ND            | 4.81     | 4.79     | 100          |      | -         | -             |      | 70-132          | -   |      | 30         |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND            | 4.52     | 3.96     | 88           |      | -         | -             |      | 73-123          | -   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | ND            | 4.81     | 4.65     | 97           |      | -         | -             |      | 71-131          | -   |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND            | 4.39     | 4.04     | 92           |      | -         | -             |      | 67-130          | -   |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | ND            | 4.81     | 4.76     | 99           |      | -         | -             |      | 69-133          | -   |      | 30         |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (8:2FTS)   | ND            | 4.58     | 4.63     | 101          |      | -         | -             |      | 64-140          | -   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | ND            | 4.58     | 4.54     | 99           |      | -         | -             |      | 70-132          | -   |      | 30         |
| Perfluorononanoic Acid (PFNA)   | ND            | 4.81     | 4.76     | 99           |      | -         | -             |      | 72-129          | -   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | ND            | 4.46     | 4.46F    | 100          |      | -         | -             |      | 68-136          | -   |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | ND            | 4.81     | 4.87     | 101          |      | -         | -             |      | 69-133          | -   |      | 30         |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)   | ND            | 4.62     | 4.37     | 85           |      | -         | -             |      | 65-137          | -   |      | 30         |
| Perfluorodecanesulfonic Acid (PFDS)   | ND            | 4.62     | 4.67     | 101          |      | -         | -             |      | 69-125          | -   |      | 30         |
| N Methyl Perfluorodecanesulfonamide (PFNS)  | ND            | 4.81     | 5.48     | 114          |      | -         | -             |      | 63-144          | -   |      | 30         |
| N Methyl Perfluorodecanesulfonamide (PFNS)  | ND            | 4.81     | 4.68     | 97           |      | -         | -             |      | 64-136          | -   |      | 30         |
| Perfluorodecanesulfonic Acid (PFDS)   | ND            | 4.63     | 4.73     | 102          |      | -         | -             |      | 59-134          | -   |      | 30         |
| Perfluorodecanesulfonamide (PFNS)   | ND            | 4.81     | 4.92F    | 102          |      | -         | -             |      | 67-137          | -   |      | 30         |
| N Ethyl Perfluorodecanesulfonamide (PFNS)   | ND            | 4.81     | 4.20     | 87           |      | -         | -             |      | 61-139          | -   |      | 30         |
| N Ethyl Perfluorodecanesulfonamide (PFNS)   | ND            | 4.81     | 4.86     | 101          |      | -         | -             |      | 69-135          | -   |      | 30         |



**Matrix Spike Analysis**  
Batch Quality Control

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

| Parameter   | Native Sample | MS Added | MS Found | MS %Recovery | Qual | MSD Found | MSD %Recovery | Qual | Recovery Limits | RPD | Qual | RPD Qual Limits |
|---|---------------|----------|----------|--------------|------|-----------|---------------|------|-----------------|-----|------|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-06,11-12 QC Batch ID: WG1401095-4 QC Sample: L2032321-05 Client ID: FB-01 |               |          |          |              |      |           |               |      |                 |     |      |                 |
| Perfluorodecanoic Acid (PFTDA)  | ND            | 4.81     | 4.74     | 99           |      | -         | -             |      | 66-139          | -   |      | 30              |
| Perfluorotetradecanoic Acid (PFTA)  | ND            | 4.81     | 4.53     | 94           |      | -         | -             |      | 69-133          | -   |      | 30              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HPFO-DA)   | ND            | 96.2     | 101      | 105          |      | -         | -             |      | 50-150          | -   |      | 30              |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)   | ND            | 4.54     | 4.33     | 95           |      | -         | -             |      | 50-150          | -   |      | 30              |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND            | 4.81     | 3.58     | 75           |      | -         | -             |      | 50-150          | -   |      | 30              |
| Perfluorooctadecanoic Acid (PFODA)  | ND            | 4.81     | 2.70     | 56           |      | -         | -             |      | 50-150          | -   |      | 30              |
| Perfluorododecane Sulfonic Acid (PFDoDS)  | ND            | 4.65     | 4.82     | 104          |      | -         | -             |      | 50-150          | -   |      | 30              |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)  | ND            | 4.63     | 7.38     | 159          | O    | -         | -             |      | 50-150          | -   |      | 30              |
| 9-Chlorohexadecylsulfonic Acid (9Cl-PF3ONS)   | ND            | 4.48     | 3.83     | 86           |      | -         | -             |      | 50-150          | -   |      | 30              |
| 11-Chlorooctadecylsulfonic Acid (11Cl-PF3OudS)  | ND            | 4.54     | 3.20     | 71           |      | -         | -             |      | 50-150          | -   |      | 30              |
| N-Methyl-Perfluorooctane Sulfonamide (NMeFOSA)  | ND            | 48.1     | 51.9     | 108          |      | -         | -             |      | 50-150          | -   |      | 30              |
| N-Ethyl-Perfluorooctane Sulfonamide (NEFOSA)  | ND            | 48.1     | 56.2     | 117          |      | -         | -             |      | 50-150          | -   |      | 30              |
| N-Methyl-Perfluorooctanesulfonamide Ethanol (NMeFOSE)   | ND            | 48.1     | 72.7     | 151          | O    | -         | -             |      | 50-150          | -   |      | 30              |
| N-Ethyl-Perfluorooctanesulfonamide Ethanol (NEFOSE)   | ND            | 48.1     | 116      | 241          | O    | -         | -             |      | 50-150          | -   |      | 30              |

| Surrogate (Extracted Internal Standard)                        | MS % Recovery | MS Qualifier | MSD % Recovery | MSD Qualifier | Acceptance Criteria |
|--|---------------|--------------|----------------|---------------|---------------------|
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-6:2FTS) | 216           | O            |                |               | 25-196              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS) | 153           | O            |                |               | 56-138              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS) | 156           |              |                |               | 32-182              |



**Matrix Spike Analysis**  
Batch Quality Control

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

| Parameter  | Native Sample | MS Added     | MS Found       | MS %Recovery  | Qual                | MSD Found | MSD %Recovery | Qual | Recovery Limits | RPD | Qual | RPD Qual Limits |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
|--|---------------|--------------|----------------|---------------|---------------------|-----------|---------------|------|-----------------|-----|------|-----------------|---|---------------|--------------|----------------|---------------|---------------------|--|----|--|--|--|--------|---|---|---|--|--|--------|---|----|---|--|--|--------|--|----|--|--|--|--------|--|----|--|--|--|--------|--|---|---|--|--|--------|--|---|---|--|--|--------|---|----|---|--|--|--------|---|----|---|--|--|--------|--|----|---|--|--|--------|---|----|---|--|--|--------|--|----|--|--|--|--------|--|----|---|--|--|--------|--|----|--|--|--|--------|---|----|---|--|--|--------|--------------------------------------|----|---|--|--|--------|---|----|---|--|--|--------|---|----|--|--|--|-------|---|----|---|--|--|--------|---------------------------------------|----|---|--|--|--------|---------------------------------------|----|---|--|--|--------|---|----|---|--|--|--------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-06,11-12 QC Batch ID: WG1401095-4 QC Sample: L2032321-05 Client ID: FB-01  |               |              |                |               |                     |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| <table border="1"> <thead> <tr> <th>Surrogate (Extracted Internal Standard)</th> <th>MS % Recovery</th> <th>MS Qualifier</th> <th>MSD % Recovery</th> <th>MSD Qualifier</th> <th>Acceptance Criteria</th> </tr> </thead> <tbody> <tr> <td>2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HPFO-DA)</td> <td>72</td> <td></td> <td></td> <td></td> <td>50-150</td> </tr> <tr> <td>2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEFOSE)</td> <td>7</td> <td>O</td> <td></td> <td></td> <td>50-150</td> </tr> <tr> <td>2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)</td> <td>12</td> <td>O</td> <td></td> <td></td> <td>50-150</td> </tr> <tr> <td>N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEFOSAA)</td> <td>96</td> <td></td> <td></td> <td></td> <td>42-136</td> </tr> <tr> <td>N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)</td> <td>75</td> <td></td> <td></td> <td></td> <td>45-137</td> </tr> <tr> <td>N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEFOSA)</td> <td>5</td> <td>O</td> <td></td> <td></td> <td>50-150</td> </tr> <tr> <td>N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)</td> <td>5</td> <td>O</td> <td></td> <td></td> <td>50-150</td> </tr> <tr> <td>Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)</td> <td>56</td> <td>O</td> <td></td> <td></td> <td>64-158</td> </tr> <tr> <td>Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)</td> <td>56</td> <td>O</td> <td></td> <td></td> <td>65-150</td> </tr> <tr> <td>Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)</td> <td>53</td> <td>O</td> <td></td> <td></td> <td>61-147</td> </tr> <tr> <td>Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)</td> <td>57</td> <td>O</td> <td></td> <td></td> <td>62-149</td> </tr> <tr> <td>Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)</td> <td>65</td> <td></td> <td></td> <td></td> <td>63-166</td> </tr> <tr> <td>Perfluoro[1,2-13C2]Dodecanoic Acid (M2PFDOA)</td> <td>53</td> <td>O</td> <td></td> <td></td> <td>56-148</td> </tr> <tr> <td>Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)</td> <td>46</td> <td></td> <td></td> <td></td> <td>26-160</td> </tr> <tr> <td>Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)</td> <td>40</td> <td>O</td> <td></td> <td></td> <td>50-150</td> </tr> <tr> <td>Perfluoro[13C4]Butanoic Acid (MPFBA)</td> <td>55</td> <td>O</td> <td></td> <td></td> <td>50-153</td> </tr> <tr> <td>Perfluoro[13C5]Pentanoic Acid (M5PFPEA)</td> <td>58</td> <td>O</td> <td></td> <td></td> <td>65-182</td> </tr> <tr> <td>Perfluoro[13C8]Octanesulfonamide (M8FOSA)</td> <td>21</td> <td></td> <td></td> <td></td> <td>1-125</td> </tr> <tr> <td>Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)</td> <td>61</td> <td>O</td> <td></td> <td></td> <td>65-151</td> </tr> <tr> <td>Perfluoro[13C8]Octanoic Acid (M8PFOA)</td> <td>55</td> <td>O</td> <td></td> <td></td> <td>62-152</td> </tr> <tr> <td>Perfluoro[13C9]Nonanoic Acid (M9PFNA)</td> <td>59</td> <td>O</td> <td></td> <td></td> <td>61-154</td> </tr> <tr> <td>Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)</td> <td>61</td> <td>O</td> <td></td> <td></td> <td>70-151</td> </tr> </tbody> </table> |               |              |                |               |                     |           |               |      |                 |     |      |                 | Surrogate (Extracted Internal Standard) | MS % Recovery | MS Qualifier | MSD % Recovery | MSD Qualifier | Acceptance Criteria | 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HPFO-DA) | 72 |  |  |  | 50-150 | 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEFOSE) | 7 | O |  |  | 50-150 | 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 12 | O |  |  | 50-150 | N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEFOSAA) | 96 |  |  |  | 42-136 | N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 75 |  |  |  | 45-137 | N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEFOSA) | 5 | O |  |  | 50-150 | N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA) | 5 | O |  |  | 50-150 | Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA) | 56 | O |  |  | 64-158 | Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA) | 56 | O |  |  | 65-150 | Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA) | 53 | O |  |  | 61-147 | Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA) | 57 | O |  |  | 62-149 | Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS) | 65 |  |  |  | 63-166 | Perfluoro[1,2-13C2]Dodecanoic Acid (M2PFDOA) | 53 | O |  |  | 56-148 | Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA) | 46 |  |  |  | 26-160 | Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA) | 40 | O |  |  | 50-150 | Perfluoro[13C4]Butanoic Acid (MPFBA) | 55 | O |  |  | 50-153 | Perfluoro[13C5]Pentanoic Acid (M5PFPEA) | 58 | O |  |  | 65-182 | Perfluoro[13C8]Octanesulfonamide (M8FOSA) | 21 |  |  |  | 1-125 | Perfluoro[13C8]Octanesulfonic Acid (M8PFOS) | 61 | O |  |  | 65-151 | Perfluoro[13C8]Octanoic Acid (M8PFOA) | 55 | O |  |  | 62-152 | Perfluoro[13C9]Nonanoic Acid (M9PFNA) | 59 | O |  |  | 61-154 | Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS) | 61 | O |  |  | 70-151 |
| Surrogate (Extracted Internal Standard)  | MS % Recovery | MS Qualifier | MSD % Recovery | MSD Qualifier | Acceptance Criteria |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HPFO-DA)   | 72            |              |                |               | 50-150              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEFOSE)  | 7             | O            |                |               | 50-150              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)  | 12            | O            |                |               | 50-150              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEFOSAA)   | 96            |              |                |               | 42-136              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)   | 75            |              |                |               | 45-137              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEFOSA)   | 5             | O            |                |               | 50-150              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)   | 5             | O            |                |               | 50-150              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)  | 56            | O            |                |               | 64-158              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 56            | O            |                |               | 65-150              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 53            | O            |                |               | 61-147              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 57            | O            |                |               | 62-149              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)   | 65            |              |                |               | 63-166              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| Perfluoro[1,2-13C2]Dodecanoic Acid (M2PFDOA)   | 53            | O            |                |               | 56-148              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 46            |              |                |               | 26-160              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 40            | O            |                |               | 50-150              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 55            | O            |                |               | 50-153              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 58            | O            |                |               | 65-182              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 21            |              |                |               | 1-125               |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 61            | O            |                |               | 65-151              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 55            | O            |                |               | 62-152              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 59            | O            |                |               | 61-154              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 61            | O            |                |               | 70-151              |           |               |      |                 |     |      |                 |   |               |              |                |               |                     |  |    |  |  |  |        |   |   |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |  |  |  |        |  |   |   |  |  |        |  |   |   |  |  |        |   |    |   |  |  |        |   |    |   |  |  |        |  |    |   |  |  |        |   |    |   |  |  |        |  |    |  |  |  |        |  |    |   |  |  |        |  |    |  |  |  |        |   |    |   |  |  |        |                                      |    |   |  |  |        |   |    |   |  |  |        |   |    |  |  |  |       |   |    |   |  |  |        |                                       |    |   |  |  |        |                                       |    |   |  |  |        |   |    |   |  |  |        |



Project Name: PFAS STUDY  
Project Number: Not Specified

**Lab Duplicate Analysis**  
Batch Quality Control

Lab Number: L2032321  
Report Date: 08/24/20

| Parameter  | Native Sample | Duplicate Sample | Units | RPD | Qual | RPD Limits |
|--|---------------|------------------|-------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 03-04,14-22 QC Batch ID: WG1398959-5 QC Sample: L2032321-19 Client ID: WFWWTP-01L |               |                  |       |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorohexanoic Acid (PFHxA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluoroheptanoic Acid (PFHpA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorooctanoic Acid (PFOA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorononanoic Acid (PFNA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorodecanoic Acid (PFDA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorododecanoic Acid (PFDoA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorotridecanoic Acid (PFTriDA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)   | ND            | ND               | ng/g  | NC  |      | 30         |

| Surrogate (Extracted Internal Standard)                        | %Recovery | Qualifier | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|-----------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)              | 54        | Q         | 54        | Q         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS) | 71        |           | 65        |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)               | 42        | Q         | 40        | Q         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                | 50        | Q         | 49        | Q         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)             | 59        | Q         | 59        | Q         | 63-166              |



Project Name: PFAS STUDY  
Project Number: Not Specified

**Lab Duplicate Analysis**  
Batch Quality Control

Lab Number: L2032321  
Report Date: 08/24/20

| Parameter  | Native Sample | Duplicate Sample | Units     | RPD       | Qual                | RPD Limits |
|--|---------------|------------------|-----------|-----------|---------------------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 03-04,14-22 QC Batch ID: WG1398959-5 QC Sample: L2032321-19 Client ID: WFWWTP-01L |               |                  |           |           |                     |            |
| Surrogate (Extracted Internal Standard)  | %Recovery     | Qualifier        | %Recovery | Qualifier | Acceptance Criteria |            |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 48            | Q                | 47        | Q         | 62-152              |            |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 46            | Q                | 45        | Q         | 61-154              |            |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 59            | Q                | 59        | Q         | 65-151              |            |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 51            | Q                | 50        | Q         | 65-150              |            |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)   | 77            |                  | 77        |           | 45-137              |            |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUOA)  | 57            | Q                | 56        | Q         | 64-158              |            |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEFOSAA)   | 86            |                  | 79        |           | 42-136              |            |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 48            | Q                | 47        | Q         | 56-148              |            |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 47            |                  | 47        |           | 26-160              |            |



Project Name: PFAS STUDY  
Project Number: Not Specified

**Lab Duplicate Analysis**  
Batch Quality Control

Lab Number: L2032321  
Report Date: 08/24/20

| Parameter  | Native Sample | Duplicate Sample | Units | RPD | Qual | RPD Limits |
|--|---------------|------------------|-------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-06,11-12 QC Batch ID: WG1401095-5 QC Sample: L2032321-06 Client ID: FB-01L |               |                  |       |     |      |            |
| Perfluorobutanoic Acid (PFBA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluoropentanoic Acid (PFPeA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorobutanesulfonic Acid (PFBS)  | ND            | ND               | ng/g  | NC  |      | 30         |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorohexanoic Acid (PFHxA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluoropentanesulfonic Acid (PFPeS)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluoroheptanoic Acid (PFHpA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorooctanoic Acid (PFOA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluoroheptanesulfonic Acid (PFHpS)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorononanoic Acid (PFNA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorodecanoic Acid (PFDA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorononanesulfonic Acid (PFNS)  | ND            | ND               | ng/g  | NC  |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorodecanesulfonic Acid (PFDS)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorooctanesulfonamide (FOSA)  | ND            | ND               | ng/g  | NC  |      | 30         |



Project Name: PFAS STUDY  
Project Number: Not Specified

**Lab Duplicate Analysis**  
Batch Quality Control

Lab Number: L2032321  
Report Date: 08/24/20

| Parameter  | Native Sample | Duplicate Sample | Units | RPD | Qual | RPD Limits |
|--|---------------|------------------|-------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-06,11-12 QC Batch ID: WG1401095-5 QC Sample: L2032321-06 Client ID: FB-01L |               |                  |       |     |      |            |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEIFOSAA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorododecanoic Acid (PFDoA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorotridecanoic Acid (PFTrDA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorohexadecanoic Acid (PFHxDA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorooctadecanoic Acid (PFODA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorododecane Sulfonic Acid (PFDoDS)   | ND            | ND               | ng/g  | NC  |      | 30         |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)   | ND            | ND               | ng/g  | NC  |      | 30         |
| 9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3QNS)  | ND            | ND               | ng/g  | NC  |      | 30         |
| 11-Chlorocosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)   | ND            | ND               | ng/g  | NC  |      | 30         |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)  | ND            | ND               | ng/g  | NC  |      | 30         |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEFOSE)  | ND            | ND               | ng/g  | NC  |      | 30         |

| Surrogate (Extracted Internal Standard) | %Recovery | Qualifier | %Recovery | Qualifier | Acceptance Criteria |
|---|-----------|-----------|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)    | 52        | Q         | 38        | Q         | 60-153              |





Project Name: PFAS STUDY  
 Project Number: Not Specified

**Lab Duplicate Analysis**  
 Batch Quality Control

Lab Number: L2032321  
 Report Date: 08/24/20

**Parameter**                      **Native Sample**                      **Duplicate Sample**                      **Units**                      **RPD**                      **Qual**                      **RPD Limits**

Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-06,11-12    QC Batch ID: WG1401095-5    QC Sample: L2032321-06  
 Client ID: FB-01L

| Surrogate (Extracted Internal Standard)  | %Recovery | Qualifier | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|-----------|-----------|---------------------|
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 55        | Q         | 40        | Q         | 65-182              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 61        | Q         | 44        | Q         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)                           | 137       |           | 101       |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 48        | Q         | 35        | Q         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 52        | Q         | 38        | Q         | 82-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 64        |           | 48        | Q         | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 50        | Q         | 38        | Q         | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6-2FTS)                           | 162       |           | 116       |           | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 51        | Q         | 40        | Q         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 59        | Q         | 43        | Q         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 52        | Q         | 38        | Q         | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8-2FTS)                           | 216       | Q         | 156       |           | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSA)                    | 76        |           | 53        |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 54        | Q         | 39        | Q         | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 16        |           | 15        |           | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEFOSA)                      | 85        |           | 58        |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 47        | Q         | 35        | Q         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 43        |           | 31        |           | 26-160              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 86        |           | 54        |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 38        | Q         | 26        | Q         | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 4         | Q         | 5         | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEFOSA)                                     | 3         | Q         | 6         | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 9         | Q         | 15        | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                     | 5         | Q         | 11        | Q         | 50-150              |



Project Name: PFAS STUDY  
 Project Number: Not Specified

Serial\_No:08242013.24  
 Lab Number: L2032321  
 Report Date: 08/24/20

**Sample Receipt and Container Information**

Were project specific reporting limits specified? YES

**Cooler Information**

| Cooler | Custody Seal |
|--------|--------------|
| A      | Absent       |
| B      | Absent       |
| C      | Absent       |
| D      | Absent       |

**Container Information**

| Container ID | Container Type  | Cooler | Initial pH | Final pH | Temp deg C | Pres | Seal   | Frozen Date/Time | Analysis(*)               |
|--------------|---|--------|------------|----------|------------|------|--------|------------------|---------------------------|
| L2032321-01A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 3.1        | Y    | Absent |                  | A2-L-EXT-537-ISOTOPE(14); |
| L2032321-02A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 3.1        | Y    | Absent |                  | A2-L-EXT-537-ISOTOPE(14); |
| L2032321-03A | Plastic 8oz unpreserved                                 | A      | NA         |          | 3.1        | Y    | Absent |                  | A2-537-ISOTOPE(28);       |
| L2032321-04A | Plastic 8oz unpreserved                                 | A      | NA         |          | 3.1        | Y    | Absent |                  | A2-537-ISOTOPE(28);       |
| L2032321-05A | Plastic 8oz unpreserved                                 | B      | NA         |          | 2.4        | Y    | Absent |                  | A2-537-ISOTOPE 38(28);    |
| L2032321-06A | Plastic 8oz unpreserved                                 | B      | NA         |          | 2.4        | Y    | Absent |                  | A2-537-ISOTOPE 38(28);    |
| L2032321-07A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | B      | NA         |          | 2.4        | Y    | Absent |                  | A2 L EXT 537 ISOTOPE(14); |
| L2032321-08A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | B      | NA         |          | 2.4        | Y    | Absent |                  | A2 L EXT 537 ISOTOPE(14); |
| L2032321-09A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | C      | NA         |          | 3.6        | Y    | Absent |                  | A2 L EXT 537 ISOTOPE(14); |
| L2032321-10A | Plastic 250ml unpreserved                               | C      | NA         |          | 3.6        | Y    | Absent |                  | A2 L EXT 537 ISOTOPE(14); |
| L2032321-11A | Plastic 8oz unpreserved                                 | C      | NA         |          | 3.6        | Y    | Absent |                  | A2-537-ISOTOPE 38(28);    |
| L2032321-12A | Plastic 8oz unpreserved                                 | C      | NA         |          | 3.6        | Y    | Absent |                  | A2-537-ISOTOPE 38(28);    |
| L2032321-13A | Plastic 250ml unpreserved                               | C      | NA         |          | 3.6        | Y    | Absent |                  | A2 L EXT 537 ISOTOPE(14); |
| L2032321-14A | Plastic 8oz unpreserved                                 | C      | NA         |          | 3.6        | Y    | Absent |                  | A2-537-ISOTOPE(28);       |
| L2032321-15A | Plastic 8oz unpreserved                                 | C      | NA         |          | 3.6        | Y    | Absent |                  | A2-537-ISOTOPE(28);       |
| L2032321-16A | Plastic 8oz unpreserved                                 | D      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE(28);       |
| L2032321-17A | Plastic 8oz unpreserved                                 | D      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE(28);       |
| L2032321-17B | Plastic 8oz unpreserved                                 | D      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE(28);       |
| L2032321-18A | Plastic 8oz unpreserved                                 | D      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE(28);       |
| L2032321-19A | Plastic 8oz unpreserved                                 | D      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE(28);       |

\*Values in parentheses indicate holding time in days



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Serial\_No:**08242013:24  
**Lab Number:** L2032321  
**Report Date:** 08/24/20

**Container Information**

| <b>Container ID</b> | <b>Container Type</b>   | <b>Cooler</b> | <b>Initial pH</b> | <b>Final pH</b> | <b>Temp deg C</b> | <b>Pres</b> | <b>Seal</b> | <b>Frozen Date/Time</b> | <b>Analysis(*)</b> |
|---------------------|-------------------------|---------------|-------------------|-----------------|-------------------|-------------|-------------|-------------------------|--------------------|
| L2032321-20A        | Plastic 8oz unpreserved | D             | NA                |                 | 3.0               | Y           | Absent      |                         | A2-537-ISOTOPE(28) |
| L2032321-21A        | Plastic 8oz unpreserved | D             | NA                |                 | 3.0               | Y           | Absent      |                         | A2-537-ISOTOPE(28) |
| L2032321-21B        | Plastic 8oz unpreserved | D             | NA                |                 | 3.0               | Y           | Absent      |                         | A2-537-ISOTOPE(28) |

\*Values in parentheses indicate holding time in days



Project Name: PFAS STUDY  
 Project Number:

Serial\_No:08242013:24  
 Lab Number: L2032321  
 Report Date: 08/24/20

**PFAS PARAMETER SUMMARY**

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



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

## GLOSSARY

### Acronyms

|                 |  |
|-----------------|--|
| <b>DL</b>       | - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  |
| <b>EDL</b>      | - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME)  |
| <b>EMPC</b>     | - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.   |
| <b>EPA</b>      | - Environmental Protection Agency.   |
| <b>LCS</b>      | - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.  |
| <b>LCSd</b>     | - Laboratory Control Sample Duplicate: Refer to LCS.   |
| <b>LIB</b>      | - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.   |
| <b>LOD</b>      | - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)   |
| <b>LOQ</b>      | - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)<br><br>Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) |
| <b>MDL</b>      | - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.  |
| <b>MS</b>       | - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 3320, the spike recovery is calculated using the native concentration, including estimated values.   |
| <b>MSD</b>      | - Matrix Spike Sample Duplicate: Refer to MS.  |
| <b>NA</b>       | - Not Applicable.  |
| <b>NC</b>       | - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.   |
| <b>NDPA/DPA</b> | - N-Nitrosodiphenylamine/Diphenylamine.  |
| <b>NI</b>       | - Not Identifiable.  |
| <b>NP</b>       | - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.  |
| <b>RI</b>       | - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RI includes any adjustments from dilutions, concentrations or moisture content, where applicable.   |
| <b>RPD</b>      | - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values, although the RPD value will be provided in the report.  |
| <b>SRM</b>      | - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.   |
| <b>STLP</b>     | - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.  |
| <b>TEF</b>      | - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.   |
| <b>TEQ</b>      | - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.  |
| <b>TIC</b>      | - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.  |

### Footnotes

**Report Format:** Data Usability Report



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

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

#### Terms

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1.8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

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

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

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 18 hours from sample collection, value will be reflected in **bold**.

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

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

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (S)' result is defined as the summation of results for: PFOA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

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

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

#### Data Qualifiers

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

Report Format: Data Usability Report



**Project Name:** PFAS STUDY

**Lab Number:** L2032321

**Project Number:** Not Specified

**Report Date:** 08/24/20

**Data Qualifiers**

Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only)

**R** - Analytical results are from sample re-analysis.

**RE** - Analytical results are from sample re-extraction.

**S** - Analytical results are from modified screening analysis.

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032321  
**Report Date:** 08/24/20

**REFERENCES**

- 134 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) using Isotope Dilution. Alpha SOP 23528.

**LIMITATION OF LIABILITIES**

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

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





### Certification Information

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

**Westborough Facility**

**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene  
**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene, SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene.  
**EPA 8270D:** NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.  
**SM1500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO<sub>2</sub>, NO<sub>3</sub>.

**Mansfield Facility**

**SM 2540D:** TSS  
**EPA 8082A:** NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.  
**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.  
**EPA TO-12** Non-methane organics  
**EPA 3C** Fixed gases  
**Biological Tissue Matrix:** EPA 3050B

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

**Westborough Facility:**

**Drinking Water**

**EPA 300.6:** Chloride, Nitrate-N, Fluoride, Sulfate, **EPA 353.2:** Nitrate-N, Nitrite-N, **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**  
**EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.  
**Microbiology:** **SM9215B, SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

**Non-Potable Water**

**SM4500H.B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LCHAT 10-107-06-1-B.** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2.** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.  
**EPA 624.1** Volatile Halocarbons & Aromatics,  
**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs  
**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil  
**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

**Mansfield Facility:**

**Drinking Water**

**EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**  
**EPA 522.**

**Non-Potable Water**

**EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.  
**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.  
**EPA 245.1 Hg.**  
**SM2340B**

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



ANALYTICAL REPORT

|                 |  |
|-----------------|--|
| Lab Number:     | L2032501   |
| Client:         | Maryland Department of the Environment<br>1800 Washington Boulevard<br>Baltimore, MD 21230 |
| ATTN:           | Amy Laliberte  |
| Phone:          | (410) 537-3614   |
| Project Name:   | PFAS STUDY   |
| Project Number: | Not Specified  |
| Report Date:    | 08/25/20   |

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Certifications & Approvals: MA (M MA030), NH NELAP (2062), CT (PH 0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA0030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68 02089), RI (LA000299), TX (T104704419), VT (VT 0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330 17 00150), USFWS (Permit #206964).

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Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/25/20

| Alpha Sample ID | Client ID | Matrix | Sample Location | Collection Date/Time | Receive Date |
|-----------------|-----------|--------|-----------------|----------------------|--------------|
| L2032501-01     | FB-W1     | WATER  | Not Specified   | 08/11/20 09:36       | 08/11/20     |
| L2032501-02     | FB-01     | TISSUE | Not Specified   | 08/11/20 09:36       | 08/11/20     |
| L2032501-03     | FB-01L    | TISSUE | Not Specified   | 08/11/20 09:36       | 08/11/20     |
| L2032501-04     | TB-201    | WATER  | Not Specified   | 08/11/20 06:30       | 08/11/20     |
| L2032501-05     | FB-7A     | WATER  | Not Specified   | 08/11/20 09:36       | 08/11/20     |
| L2032501-06     | TB-200    | WATER  | Not Specified   | 08/11/20 06:00       | 08/11/20     |
| L2032501-07     | HP-01L    | TISSUE | Not Specified   | 08/11/20 10:00       | 08/11/20     |
| L2032501-08     | HP-01     | TISSUE | Not Specified   | 08/11/20 10:00       | 08/11/20     |
| L2032501-09     | FB-9A     | WATER  | Not Specified   | 08/11/20 10:00       | 08/11/20     |
| L2032501-10     | HP-W1     | WATER  | Not Specified   | 08/11/20 10:00       | 08/11/20     |
| L2032501-11     | FB-9B     | WATER  | Not Specified   | 08/11/20 09:00       | 08/11/20     |
| L2032501-12     | DP-W1     | WATER  | Not Specified   | 08/11/20 09:00       | 08/11/20     |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

### Case Narrative

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

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

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

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

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

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

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**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

### Case Narrative (continued)

#### Report Submission

August 25, 2020: This is a preliminary report.

#### Perfluorinated Alkyl Acids by Isotope Dilution

L2032501-01, -01(MEOH), -05 and -05(MEOH): Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

L2032501-02, -03, -07, -08, and -10: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

L2032501-09, -09(MEOH) -10 and -10(MEOH): Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

L2032501-01(MEOH): The MeOH fraction of the extraction is reported for the following compounds:

Perfluorooctanesulfonamide (FOSA), N-Methyl Perfluorooctane Sulfonamide (NMeFOSA), N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA), N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE), and N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE) due to better extraction efficiency of the Surrogates (Extracted Internal Standards).

L2032501-05(MEOH): The MeOH fraction of the extraction is reported for the following compounds: N-Methyl Perfluorooctane Sulfonamide (NMeFOSA), N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA) due to better extraction efficiency of the Surrogates (Extracted Internal Standards).

L2032501-09(MEOH): The MeOH fraction of the extraction is reported for the following compounds: , N-Methyl Perfluorooctane Sulfonamide (NMeFOSA), N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA) due to better extraction efficiency of the Surrogates (Extracted Internal Standards).

L2032501-10(MEOH): The MeOH fraction of the extraction is reported for the following compounds: N-Methyl Perfluorooctane Sulfonamide (NMeFOSA), N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA), N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE), and N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE) due to better extraction efficiency of the Surrogates (Extracted Internal Standards).

WG1399517-1(MEOH), WG1399517-2(MEOH) and WG1399517-3(MEOH): Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**Case Narrative (continued)**

the report for details.

WG1399517-1, WG1399517-2, WG1399517-3, WG1401095-1, WG1401095-2 and WG1401095-3:

Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

The WG1399985-1 Method Blank, associated with L2032501-11, and -12, has a concentration above the reporting limit for PFOS. Since the sample(s) were non-detect to the RL for this target analyte, no further actions were taken. The results of the original analysis are reported.

The WG1399517-2 LCS recovery, associated with L2032501-05, -09, and -10, is above the acceptance criteria for 1h,1h,2h,2h-perfluorododecanesulfonic acid (10:2fts) (188%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

The WG1399517-3 LCS recoveries, associated with L2032501-05, -09, and -10, are above the acceptance criteria for 1h,1h,2h,2h-perfluorododecanesulfonic acid (10:2fts) (189%) and n-ethyl perfluorooctanesulfonamido ethanol (netfose) (172%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

The WG1399517-2/-3(MEOH) LCS/LCSD RPD, associated with L2032501-05, -09, and -10, is above the acceptance criteria for n-ethyl perfluorooctanesulfonamido ethanol (netfose) (40%).

The WG1401095-2 LCS recovery, associated with L2032501-02, -03, -07, and -08, is above the acceptance criteria for 1h,1h,2h,2h-perfluorododecanesulfonic acid (10:2fts) (201%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

The WG1401095-3 LCSD recoveries, associated with L2032501-02, -03, -07, and -08, are above the acceptance criteria for 1h,1h,2h,2h-perfluorododecanesulfonic acid (10:2fts) (175%), n-methyl perfluorooctanesulfonamido ethanol (nmefose) (183%) and n-ethyl perfluorooctanesulfonamido ethanol (netfose) (189%); however, the associated samples are non-detect to the RL for these target analytes. The results of the original analysis are reported.

The WG1401095-2/-3 LCS/LCSD RPD(s), associated with L2032501-02, -03, -07, and -08, are above the acceptance criteria for n-methyl perfluorooctane sulfonamide (nmefosa) (42%) and n-ethyl perfluorooctane sulfonamide (netfosa) (34%).

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

Authorized Signature:

*Susan O'Neil*

Susan O'Neil

Title: Technical Director/Representative

Date: 08/25/20

# ORGANICS



# SEMIVOLATILES





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-01  
**Client ID:** FB-W1  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/20/20 00:44  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |      |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | 3.61   |           | ng/l  | 1.80 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.52   |           | ng/l  | 1.80 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 3.07   |           | ng/l  | 1.80 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | 3.20   |           | ng/l  | 1.80 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)                           | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/l  | 45.1 | --  | 1               |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/l  | 3.61 | --  | 1               |
| Perfluorooctadecanoic Acid (PFODA)  | ND     |           | ng/l  | 3.61 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-01  
**Client ID:** FB-W1  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/l  | 1.80 | -   | 1               |
| 1H,1H,2H,2H Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/l  | 4.51 | -   | 1               |
| 9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)         | ND     |           | ng/l  | 1.80 | -   | 1               |
| 11-Chloroicosafafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUDS)   | ND     |           | ng/l  | 1.80 | -   | 1               |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 45         |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 40         |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 74         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 104        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 27         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 32         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 83         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 31         | O         | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 81         |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 29         | O         | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 65         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 31         | O         | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 61         |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 27         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 37         | Q         | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 1          |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 24         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 35         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 38         |           | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 23         | O         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 51         |           | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-01  
**Client ID:** FB-W1  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/20/20 14:00  
**Analyst:** JW

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorooctanesulfonamide (FOSA)                                     | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/l  | 18.0 | --  | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/l  | 18.0 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/l  | 45.1 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/l  | 45.1 | --  | 1               |

| Surrogate (Extracted Internal Standard)                               | % Recovery | Qualifier | Acceptance Criteria |
|---|------------|-----------|---------------------|
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                             | 6          |           | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 6          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                 | 6          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 9          | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)  | 8          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-02  
**Client ID:** FB-01  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/22/20 05:05  
**Analyst:** JW  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/20/20 14:15

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |       |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                          | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/g  | 9.80  | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/g  | 1.96  | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-02  
**Client ID:** FB-01  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/g  | 1.96  | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/g  | 0.980 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/g  | 0.980 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)       | ND     |           | ng/g  | 0.980 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/g  | 0.980 | --  | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/g  | 0.980 | -   | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/g  | 0.980 | -   | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/g  | 1.96  | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/g  | 1.96  | -   | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-02  
**Client ID:** FB-01  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 58         | Q         | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 61         | Q         | 65-182              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 66         | Q         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 157        | Q         | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 54         | Q         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 60         | Q         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 70         |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 57         | Q         | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 179        |           | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 60         | Q         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 64         | Q         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 57         | Q         | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 223        | Q         | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 81         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                 | 62         | Q         | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 18         |           | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                    | 93         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 56         |           | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 49         |           | 26-160              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 90         |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 44         | Q         | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 5          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                    | 6          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 10         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                     | 5          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-03  
**Client ID:** FB-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/22/20 05:22  
**Analyst:** JW  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/20/20 14:15

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |       |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | 1.57   |           | ng/g  | 0.943 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                          | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/g  | 9.43  | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/g  | 1.89  | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

Lab ID: L2032501-03  
 Client ID: FB-01L  
 Sample Location: Not Specified

Date Collected: 08/11/20 09:36  
 Date Received: 08/11/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/g  | 1.89  | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/g  | 0.943 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/g  | 0.943 | -   | 1               |
| 9-Chlorohexadecafluoro-3-Oxaone-1-Sulfonic Acid (9Cl-PF3ONS)          | ND     |           | ng/g  | 0.943 | -   | 1               |
| 11-Chloroicosafafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)   | ND     |           | ng/g  | 0.943 | -   | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/g  | 0.943 | -   | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/g  | 0.943 | -   | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/g  | 1.89  | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/g  | 1.89  | -   | 1               |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-03  
**Client ID:** FB-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 53         | Q         | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 57         | Q         | 65-182              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 58         | Q         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 124        |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 50         | Q         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 54         | Q         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 62         | Q         | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 52         | Q         | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 145        |           | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 55         | Q         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 59         | Q         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 52         | Q         | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 178        |           | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 68         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                 | 56         | Q         | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 18         |           | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                    | 78         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 51         | Q         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 42         |           | 26-160              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 88         |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 38         | Q         | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 6          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                    | 6          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 12         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                     | 6          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-05  
**Client ID:** FB-7A  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/20/20 01:00  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/17/20 12:25

| Parameter  | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|--|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>              |        |           |       |      |     |                 |
| Perfluorobutanoic Acid (PFBA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorononanoic Acid (PFNA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                          | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                           | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoro(propoxy)-Propanoic Acid (HFPO-DA) | ND     |           | ng/l  | 45.1 | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)  | ND     |           | ng/l  | 3.60 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-05  
**Client ID:** FB-7A  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/l  | 3.60 | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/l  | 1.80 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/l  | 4.51 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)         | ND     |           | ng/l  | 1.80 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/l  | 45.1 | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEFOSE)                   | ND     |           | ng/l  | 45.1 | -   | 1               |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 39         |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 39         |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 70         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 37         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 33         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 40         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 76         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 40         |           | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 47         |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 39         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 73         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 45         |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 56         |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 45         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 58         |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 30         |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 47         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 53         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 45         |           | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 43         | Q         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 54         |           | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 16         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEFOSE)                      | 11         | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-05  
**Client ID:** FB-7A  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/20/20 14:17  
**Analyst:** JW

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/l  | 18.0 | --  | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/l  | 18.0 | --  | 1               |

| Surrogate (Extracted Internal Standard)                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA) | 4          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)  | 4          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-07  
**Client ID:** HP-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/22/20 05:38  
**Analyst:** JW  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/20/20 14:15

| Parameter  | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|--|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>              |        |           |       |       |     |                 |
| Perfluorobutanoic Acid (PFBA)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorononanoic Acid (PFNA)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                          | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                           | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoro(propoxy)-Propanoic Acid (HFPO-DA) | ND     |           | ng/g  | 9.64  | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)  | ND     |           | ng/g  | 1.93  | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

Lab ID: L2032501-07  
 Client ID: HP-01L  
 Sample Location: Not Specified

Date Collected: 08/11/20 10:00  
 Date Received: 08/11/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/g  | 1.93  | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/g  | 0.964 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/g  | 0.964 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)       | ND     |           | ng/g  | 0.964 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/g  | 0.964 | --  | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/g  | 0.964 | -   | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/g  | 0.964 | -   | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/g  | 1.93  | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/g  | 1.93  | -   | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-07  
**Client ID:** HP-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 48         | O         | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 51         | O         | 65-182              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 54         | O         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 134        |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 45         | Q         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 49         | Q         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 56         | Q         | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 47         | Q         | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 157        |           | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 49         | O         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 53         | O         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 46         | O         | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 230        | O         | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 77         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                 | 48         | O         | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 16         |           | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                    | 82         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 41         | Q         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 38         |           | 26-160              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 76         |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 32         | O         | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 4          | O         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                    | 4          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 8          | O         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                     | 5          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-08  
**Client ID:** HP-01  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/22/20 05:55  
**Analyst:** JW  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/20/20 14:15

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |       |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                          | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/g  | 9.01  | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/g  | 1.80  | --  | 1               |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-08  
**Client ID:** HP-01  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/g  | 1.80  | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/g  | 0.901 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/g  | 0.901 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanon-1-Sulfonic Acid (9Cl-PF3ONS)          | ND     |           | ng/g  | 0.901 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/g  | 0.901 | --  | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/g  | 0.901 | -   | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/g  | 0.901 | -   | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/g  | 1.80  | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/g  | 1.80  | -   | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-08  
**Client ID:** HP-01  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 58         | Q         | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 60         | Q         | 65-182              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 66         | Q         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 169        | Q         | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 55         | Q         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 60         | Q         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 70         |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 59         | Q         | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 191        | Q         | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 62         |           | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 63         | Q         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 56         | Q         | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 261        | Q         | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 91         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                 | 61         | Q         | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 21         |           | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                    | 82         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 52         | Q         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 43         |           | 26-160              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 101        |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 34         | Q         | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 7          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                    | 7          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 12         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                     | 5          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-09  
**Client ID:** FB-9A  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/20/20 01:17  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/17/20 12:25

| Parameter  | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|--|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>              |        |           |       |      |     |                 |
| Perfluorobutanoic Acid (PFBA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)   | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorononanoic Acid (PFNA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                          | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)   | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                           | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)   | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoro(propoxy)-Propanoic Acid (HFPO-DA) | ND     |           | ng/l  | 43.9 | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)  | ND     |           | ng/l  | 3.51 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-09  
**Client ID:** FB-9A  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/l  | 3.51 | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/l  | 1.78 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/l  | 4.39 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)         | ND     |           | ng/l  | 1.76 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/l  | 1.78 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/l  | 43.9 | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEFOSE)                   | ND     |           | ng/l  | 43.9 | -   | 1               |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 51         |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 48         |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 75         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 41         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 42         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 51         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 80         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 53         |           | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 47         |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 52         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 77         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 60         |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 56         |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 54         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 73         |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 41         |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 53         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 67         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 54         |           | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 50         |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 64         |           | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 27         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)                     | 21         | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-09  
**Client ID:** FB-9A  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/20/20 14:33  
**Analyst:** JW

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/l  | 17.8 | --  | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/l  | 17.6 | --  | 1               |

| Surrogate (Extracted Internal Standard)                               | % Recovery | Qualifier | Acceptance Criteria |
|---|------------|-----------|---------------------|
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                             | 7          |           | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 5          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                 | 5          | O         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 10         | O         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)  | 13         | O         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-10  
**Client ID:** HP-W1  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/20/20 01:33  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/17/20 12:25

| Parameter  | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|--|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>              |        |           |       |      |     |                 |
| Perfluorobutanoic Acid (PFBA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)  | 2.38   |           | ng/l  | 1.76 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)   | 2.14   |           | ng/l  | 1.76 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)  | 2.10   |           | ng/l  | 1.76 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorononanoic Acid (PFNA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)  | 2.03   |           | ng/l  | 1.76 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                          | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)   | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                           | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)   | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoro(propoxy)-Propanoic Acid (HFPO-DA) | ND     |           | ng/l  | 44.1 | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)  | ND     |           | ng/l  | 3.53 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-10  
**Client ID:** HP-W1  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/l  | 3.53 | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/l  | 1.78 | -   | 1               |
| 1H,1H,2H,2H Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/l  | 4.41 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)         | ND     |           | ng/l  | 1.76 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUDS)     | ND     |           | ng/l  | 1.78 | --  | 1               |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 23         |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 20         |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 70         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 75         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 15         | Q         | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 20         | Q         | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 78         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 21         | Q         | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 64         |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 23         | Q         | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 68         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 32         | Q         | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 57         |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 60         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 39         | Q         | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 7          |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 57         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 41         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 46         |           | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 15         | Q         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 62         |           | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

Lab ID: L2032501-10  
 Client ID: HP-W1  
 Sample Location: Not Specified

Date Collected: 08/11/20 10:00  
 Date Received: 08/11/20  
 Field Prep: Not Specified

Sample Depth:  
 Matrix: Water  
 Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 08/20/20 14:50  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/l  | 17.6 | --  | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/l  | 17.6 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/l  | 44.1 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/l  | 44.1 | --  | 1               |

| Surrogate (Extracted Internal Standard)                               | % Recovery | Qualifier | Acceptance Criteria |
|---|------------|-----------|---------------------|
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 5          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                 | 7          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 10         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)  | 13         | Q         | 50-150              |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

Lab ID: L2032501-11  
 Client ID: FB-9B  
 Sample Location: Not Specified

Date Collected: 08/11/20 09:00  
 Date Received: 08/11/20  
 Field Prep: Not Specified

Sample Depth:  
 Matrix: Water  
 Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 08/19/20 13:28  
 Analyst: SG

Extraction Method: ALPHA 23528  
 Extraction Date: 08/18/20 11:10

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.78 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.78 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.78 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

Lab ID: L2032501-11  
 Client ID: FB-9B  
 Sample Location: Not Specified

Date Collected: 08/11/20 09:00  
 Date Received: 08/11/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 82         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 52         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 67         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 78         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 90         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 80         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 74         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 83         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 79         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 79         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 100        |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 78         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 93         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 68         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-12  
**Client ID:** DP-W1  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/19/20 13:44  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/18/20 11:10

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.06   |           | ng/l  | 1.84 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.84 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.84 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**SAMPLE RESULTS**

Lab ID: L2032501-12  
 Client ID: DP-W1  
 Sample Location: Not Specified

Date Collected: 08/11/20 09:00  
 Date Received: 08/11/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 85         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 111        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 70         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 86         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 96         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 85         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 77         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 81         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 77         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 80         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 88         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 87         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 85         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 72         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 08/19/20 21:58  
 Analyst: SG

Extraction Method: ALPHA 23528  
 Extraction Date: 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01,05,09-10 Batch: WG1399517-1</b> |        |           |       |      |     |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/l  | 2.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/l  | 2.00 | --  |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy] Propanoic Acid (HFPO-DA)                                   | ND     |           | ng/l  | 50.0 | --  |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)   | ND     |           | ng/l  | 2.00 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**Method Blank Analysis  
 Batch Quality Control**

**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/19/20 21:58  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01,05,09-10 Batch: WG1399517-1</b> |        |           |       |      |     |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/l  | 4.00 | --  |
| Perfluorooctadecanoic Acid (PFODA)  | ND     |           | ng/l  | 4.00 | --  |
| Perfluorododecane Sulfonic Acid (PFDoDS)  | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2F7S)  | ND     |           | ng/l  | 5.00 | --  |
| 9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)   | ND     |           | ng/l  | 2.00 | --  |
| 11-Chloroicosafuoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)  | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | ND     |           | ng/l  | 20.0 | --  |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | ND     |           | ng/l  | 20.0 | --  |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)   | ND     |           | ng/l  | 50.0 | --  |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEFOSE)   | ND     |           | ng/l  | 50.0 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 08/19/20 21:58  
 Analyst: SG

Extraction Method: ALPHA 23528  
 Extraction Date: 08/17/20 12:25

| Parameter  | Result | Qualifier | Units | RL | MDL |
|--|--------|-----------|-------|----|-----|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01,05,09-10 Batch: WG1399517-1 |        |           |       |    |     |

| Surrogate (Extracted Internal Standard)  | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 53        |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 47        |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 72        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 50        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 45        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 53        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 79        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 54        |           | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 58        |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 53        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 79        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 61        |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 66        |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 57        |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                 | 78        |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 50        |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 52        |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 72        |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 67        |           | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 38        | Q         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 94        |           | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 5         | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                                    | 4         | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 35        | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)                     | 29        | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 08/20/20 12:54  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01,05,09-10 Batch: WG1399517-1</b> |        |           |       |      |     |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | ND     |           | ng/l  | 20.0 | --  |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | ND     |           | ng/l  | 20.0 | --  |
| N-Methyl Perfluorooctanesulfonamide Ethanol (NMeFOSE)   | ND     |           | ng/l  | 50.0 | --  |
| N-Ethyl Perfluorooctanesulfonamide Ethanol (NEFOSE)   | ND     |           | ng/l  | 50.0 | --  |

| Surrogate (Extracted Internal Standard)                               | %Recovery | Qualifier | Acceptance Criteria |
|---|-----------|-----------|---------------------|
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                             | 6         |           | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 3         | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEFOSA)                  | 3         | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 6         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEFOSE)   | 7         | Q         | 50-150              |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**Method Blank Analysis  
 Batch Quality Control**

**Analytical Method:** 134.LCMSMS-ID  
**Analytical Date:** 08/19/20 11:20  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/18/20 11:10

| Parameter  | Result | Qualifier | Units | RL   | MDL |
|--|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 11-12 Batch: WG139985-1</b> |        |           |       |      |     |
| Perfluorobutanoic Acid (PFBA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoropentanoic Acid (PFPeA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorobutanesulfonic Acid (PFBS)  | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanoic Acid (PFHxA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoropentanesulfonic Acid (PFPeS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanoic Acid (PFOA)  | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanesulfonic Acid (PFHpS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanoic Acid (PFNA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)  | 9.62   |           | ng/l  | 2.00 | --  |
| Perfluorodecanoic Acid (PFDA)  | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanesulfonic Acid (PFNS)  | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorodecanesulfonic Acid (PFDS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonamide (FOSA)  | ND     |           | ng/l  | 2.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDoA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)   | ND     |           | ng/l  | 2.00 | --  |
| PFOA/PFOS, Total   | 9.62   |           | ng/l  | 2.00 | --  |
| PFAS, Total (5)  | 9.62   |           | ng/l  | 2.00 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**Method Blank Analysis  
 Batch Quality Control**

**Analytical Method:** 134.LCMSMS-ID  
**Analytical Date:** 08/19/20 11:20  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/18/20 11:10

| Parameter   | Result | Qualifier | Units | RL | MDL |
|---|--------|-----------|-------|----|-----|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 11-12 Batch: WG139985-1 |        |           |       |    |     |

| Surrogate (Extracted Internal Standard)                                | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)                                   | 82        |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)                                | 74        |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 82        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)         | 50        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 65        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 77        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 91        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 79        |           | 38-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)         | 61        |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 71        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 86        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 79        |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)         | 67        |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 91        |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 99        |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                              | 41        |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 61        |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 88        |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 77        |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 08/22/20 02:36  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 08/20/20 14:15

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 02-03,07-08 Batch: WG1401095-1</b> |        |           |       |      |     |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/g  | 1.00 | --  |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 1.00 | --  |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 1.00 | --  |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/g  | 1.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/g  | 1.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/g  | 1.00 | --  |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy] Propanoic Acid (HFPO-DA)                                   | ND     |           | ng/g  | 10.0 | --  |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)   | ND     |           | ng/g  | 1.00 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**Method Blank Analysis  
 Batch Quality Control**

**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/22/20 02:36  
**Analyst:** JW

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/20/20 14:15

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 02-03,07-08 Batch: WG1401095-1</b> |        |           |       |      |     |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/g  | 2.00 | --  |
| Perfluorooctadecanoic Acid (PFODA)  | ND     |           | ng/g  | 2.00 | --  |
| Perfluorododecane Sulfonic Acid (PFDoDS)  | ND     |           | ng/g  | 1.00 | --  |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)  | ND     |           | ng/g  | 1.00 | --  |
| 9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)   | ND     |           | ng/g  | 1.00 | --  |
| 11-Chloroicosaffluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)  | ND     |           | ng/g  | 1.00 | --  |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | ND     |           | ng/g  | 1.00 | --  |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)   | ND     |           | ng/g  | 1.00 | --  |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)   | ND     |           | ng/g  | 2.00 | --  |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)  | ND     |           | ng/g  | 2.00 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 08/22/20 02:36  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 08/20/20 14:15

| Parameter  | Result | Qualifier | Units | RL | MDL |
|--|--------|-----------|-------|----|-----|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 02-03,07-08 Batch: WG1401095-1 |        |           |       |    |     |

| Surrogate (Extracted Internal Standard)  | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 73        |           | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 82        |           | 65-182              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 80        |           | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 297       | Q         | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 66        |           | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 71        |           | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 84        |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 73        |           | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 299       | Q         | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 71        |           | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 80        |           | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 72        |           | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 353       | Q         | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 143       | Q         | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                 | 69        |           | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 51        |           | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 140       | Q         | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 59        |           | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 59        |           | 26-160              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 89        |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 68        |           | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 5         | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                                    | 5         | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 10        | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)                     | 7         | Q         | 50-150              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/25/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,05,09-10 Batch: WG1399517-2 WG1399517-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanoic Acid (PFBA)   | 110       |      | 112       |      | 67-148           | 2   |      | 30         |
| Perfluoropentanoic Acid (PFPeA)   | 107       |      | 108       |      | 63-181           | 1   |      | 30         |
| Perfluorobutanesulfonic Acid (PFBS)   | 114       |      | 114       |      | 65-157           | 0   |      | 30         |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | 107       |      | 113       |      | 37-219           | 5   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 114       |      | 116       |      | 69-188           | 2   |      | 30         |
| Perfluoropentanesulfonic Acid (PFPeS)   | 101       |      | 100       |      | 52-156           | 1   |      | 30         |
| Perfluorohexanoic Acid (PFHpA)  | 112       |      | 111       |      | 58-159           | 1   |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | 111       |      | 112       |      | 69-177           | 1   |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 119       |      | 120       |      | 63-159           | 1   |      | 30         |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (8:2FTS)   | 127       |      | 130       |      | 49-187           | 2   |      | 30         |
| Perfluorooheptanesulfonic Acid (PFHpS)  | 116       |      | 108       |      | 61-179           | 7   |      | 30         |
| Perfluorononanoic Acid (PFNA)   | 113       |      | 117       |      | 68-171           | 3   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 116       |      | 111       |      | 52-151           | 4   |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | 109       |      | 111       |      | 63-171           | 2   |      | 30         |
| 1H,1H,2H,2H-Perfluorodecane sulfonic Acid (8:2FTS)  | 118       |      | 118       |      | 56-173           | 0   |      | 30         |
| Perfluorononanesulfonic Acid (PFNS)   | 134       |      | 118       |      | 48-150           | 13  |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | 111       |      | 128       |      | 60-166           | 14  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | 109       |      | 107       |      | 80-153           | 2   |      | 30         |
| Perfluorodecane sulfonic Acid (PFDS)  | 138       |      | 124       |      | 38-156           | 9   |      | 30         |
| Perfluorooctanesulfonamide (FOSA)   | 112       |      | 117       |      | 46-170           | 4   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | 107       |      | 109       |      | 45-170           | 2   |      | 30         |
| Perfluorododecanoic Acid (PFDoA)  | 121       |      | 122       |      | 67-153           | 1   |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/25/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,05,09-10 Batch: WG1399517-2 WG1399517-3 |           |      |           |      |                  |     |      |            |
| Perfluorotridecanoic Acid (PFTDA)   | 128       |      | 128       |      | 48-158           | 0   |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | 102       |      | 99        |      | 59-182           | 3   |      | 30         |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Hexafluoropropoxy]-Propanoic Acid (HFPO-DA)  | 114       |      | 109       |      | 50-150           | 4   |      | 30         |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)   | 107       |      | 105       |      | 50-150           | 2   |      | 30         |
| Perfluorohexadecanoic Acid (PFHxDA)   | 112       |      | 106       |      | 50-150           | 6   |      | 30         |
| Perfluorooctadecanoic Acid (PFODA)  | 63        |      | 51        |      | 50-150           | 21  |      | 30         |
| Perfluorododecane Sulfonic Acid (PFDS)  | 144       |      | 143       |      | 50-150           | 1   |      | 30         |
| 1H,1H,2H,2H-Perfluorododecane sulfonic Acid (10:2FTS)   | 188       | Q    | 189       | Q    | 50-150           | 1   |      | 30         |
| 9-Chlorohexadecafluoro-3-Oxanon-1-Sulfonic Acid (9Cl-PF9ONS)  | 115       |      | 108       |      | 50-150           | 5   |      | 30         |
| 11-Chlorooctadecafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF30US)   | 116       |      | 107       |      | 50-150           | 8   |      | 30         |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | 96        |      | 115       |      | 50-150           | 18  |      | 30         |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | 100       |      | 100       |      | 50-150           | 0   |      | 30         |
| N-Methyl Perfluorooctanesulfonamide Ethanol (NMeFOSE)   | 133       |      | 141       |      | 50-150           | 6   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamide Ethanol (NEFOSE)   | 150       |      | 172       | Q    | 50-150           | 14  |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/25/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | RPD  |        |
|---|-----------|------|-----------|------|------------------|-----|------|--------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     | Qual | Limits |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,05,09-10 Batch: WG1399517-2 WG1399517-3 |           |      |           |      |                  |     |      |        |

| Surrogate (Extracted Internal Standard)  | LCS       |      | LCSD      |      | Acceptance Criteria |
|--|-----------|------|-----------|------|---------------------|
|  | %Recovery | Qual | %Recovery | Qual |                     |
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 48        |      | 49        |      | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 43        |      | 44        |      | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 69        |      | 74        |      | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 49        |      | 51        |      | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 40        |      | 40        |      | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 47        |      | 48        |      | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 75        |      | 79        |      | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 48        |      | 49        |      | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 57        |      | 60        |      | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 45        |      | 47        |      | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 73        |      | 80        |      | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 52        |      | 56        |      | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 69        |      | 70        |      | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 47        |      | 42        |      | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUOA)                                  | 64        |      | 71        |      | 40-144              |
| Perfluoro[13C6]Octanesulfonamide (M6FOSA)  | 50        |      | 45        |      | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                    | 49        |      | 50        |      | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (M2PFDOA)   | 61        |      | 66        |      | 24-181              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEA)  | 60        |      | 64        |      | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 31        | Q    | 34        | Q    | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 87        |      | 93        |      | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 3         | Q    | 1         | Q    | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                    | 2         | Q    | 1         | Q    | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 38        | Q    | 26        | Q    | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                     | 29        | Q    | 18        | Q    | 50-150              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/25/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | RPD  |        |
|---|-----------|------|-----------|------|------------------|-----|------|--------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     | Qual | Limits |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,05,09-10 Batch: WG1399517-2 WG1399517-3 |           |      |           |      |                  |     |      |        |

|   |     |  |     |  |        |    |   |    |
|---|-----|--|-----|--|--------|----|---|----|
| Perfluorooctanesulfonamide (FOSA)                     | 108 |  | 113 |  | 46-170 | 1  |   | 30 |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)        | 104 |  | 81  |  | 50-150 | 17 | Q | 30 |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)          | 87  |  | 101 |  | 50-150 | 1  |   | 30 |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE) | 112 |  | 123 |  | 50-150 | 8  |   | 30 |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEIFOSE)  | 90  |  | 100 |  | 50-150 | 40 | Q | 30 |

| Surrogate (Extracted Internal Standard)                               | LCS       |      | LCSD      |      | Acceptance Criteria |
|---|-----------|------|-----------|------|---------------------|
|   | %Recovery | Qual | %Recovery | Qual |                     |
| Perfluoro[13C6]Octanesulfonamide (M6FOSA)                             | 6         |      | 6         |      | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 3         | Q    | 4         | Q    | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                 | 3         | Q    | 4         | Q    | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 9         | Q    | 8         | Q    | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)  | 11        | Q    | 10        | Q    | 50-150              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/25/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 11-12 Batch: WG1399985-2 WG1399985-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanoic Acid (PFBA)   | 107       |      | 108       |      | 67-148           | 1   |      | 30         |
| Perfluoropentanoic Acid (PFPeA)   | 102       |      | 103       |      | 63-181           | 1   |      | 30         |
| Perfluorobutanesulfonic Acid (PFBS)   | 103       |      | 100       |      | 65-157           | 3   |      | 30         |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | 104       |      | 103       |      | 37-219           | 1   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 109       |      | 110       |      | 69-188           | 1   |      | 30         |
| Perfluoropentanesulfonic Acid (PFPeS)   | 95        |      | 93        |      | 52-156           | 2   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 104       |      | 106       |      | 58-159           | 2   |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | 103       |      | 105       |      | 69-177           | 2   |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 110       |      | 113       |      | 63-159           | 3   |      | 30         |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (8:2FTS)   | 113       |      | 120       |      | 49-187           | 6   |      | 30         |
| Perfluorooheptanesulfonic Acid (PFHpS)  | 102       |      | 108       |      | 61-179           | 6   |      | 30         |
| Perfluorononanoic Acid (PFNA)   | 109       |      | 111       |      | 68-171           | 2   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 101       |      | 108       |      | 52-151           | 7   |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | 104       |      | 109       |      | 63-171           | 5   |      | 30         |
| 1H,1H,2H,2H-Perfluorodecane sulfonic Acid (8:2FTS)  | 114       |      | 122       |      | 56-173           | 8   |      | 30         |
| Perfluorononanesulfonic Acid (PFNS)   | 111       |      | 124       |      | 48-150           | 11  |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | 84        |      | 102       |      | 60-166           | 19  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | 104       |      | 101       |      | 80-153           | 3   |      | 30         |
| Perfluorodecane sulfonic Acid (PFDS)  | 120       |      | 132       |      | 38-156           | 10  |      | 30         |
| Perfluorooctanesulfonamide (FOSA)   | 104       |      | 109       |      | 46-170           | 5   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | 95        |      | 99        |      | 45-170           | 4   |      | 30         |
| Perfluorododecanoic Acid (PFDoA)  | 105       |      | 112       |      | 67-153           | 6   |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/25/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 11-12 Batch: WG1399985-2 WG1399985-3 |           |      |           |      |                  |     |      |            |
| Perfluorotridecanoic Acid (PFTrDA)  | 107       |      | 117       |      | 48-158           | 9   |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | 95        |      | 99        |      | 59-182           | 1   |      | 30         |

| Surrogate (Extracted Internal Standard)                                | LCS       |      | LCSD      |      | Acceptance Criteria |
|--|-----------|------|-----------|------|---------------------|
|  | %Recovery | Qual | %Recovery | Qual |                     |
| Perfluoro[13C4]Butanoic Acid (MPFBA)                                   | 84        |      | 87        |      | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)                                | 79        |      | 80        |      | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 81        |      | 88        |      | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)         | 54        |      | 58        |      | 1-313               |
| Perfluoro[1,2,3,4,5-13C5]Hexanoic Acid (M5PFHxA)                       | 67        |      | 67        |      | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 79        |      | 79        |      | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 88        |      | 94        |      | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 80        |      | 81        |      | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)         | 63        |      | 71        |      | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 74        |      | 77        |      | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 87        |      | 89        |      | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 81        |      | 88        |      | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)         | 69        |      | 75        |      | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 105       |      | 103       |      | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)               | 99        |      | 106       |      | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                              | 44        |      | 40        |      | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEFOSAA)   | 90        |      | 93        |      | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 97        |      | 100       |      | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 85        |      | 88        |      | 33-143              |





**Lab Control Sample Analysis**  
Batch Quality Control

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02-03,07-08 Batch: WG1401095-2 WG1401095-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanoic Acid (PFBA)   | 119       |      | 101       |      | 71-135           | 16  |      | 30         |
| Perfluoropentanoic Acid (PFPeA)   | 125       |      | 105       |      | 59-132           | 17  |      | 30         |
| Perfluorobutanesulfonic Acid (PFBS)   | 123       |      | 109       |      | 72-128           | 12  |      | 30         |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | 125       |      | 109       |      | 62-145           | 14  |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 124       |      | 105       |      | 70-132           | 17  |      | 30         |
| Perfluoropentanesulfonic Acid (PFPeS)   | 114       |      | 97        |      | 73-123           | 16  |      | 30         |
| Perfluorohexanoic Acid (PFHpA)  | 123       |      | 104       |      | 71-131           | 17  |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | 120       |      | 99        |      | 67-130           | 19  |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 121       |      | 107       |      | 69-133           | 12  |      | 30         |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (8:2FTS)   | 125       |      | 103       |      | 64-140           | 19  |      | 30         |
| Perfluorooptanesulfonic Acid (PFHpS)  | 124       |      | 107       |      | 70-132           | 15  |      | 30         |
| Perfluorononanoic Acid (PFNA)   | 119       |      | 105       |      | 72-129           | 13  |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 119       |      | 108       |      | 68-136           | 10  |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | 121       |      | 103       |      | 69-133           | 16  |      | 30         |
| 1H,1H,2H,2H-Perfluorodecane sulfonic Acid (8:2FTS)  | 130       |      | 109       |      | 65-137           | 16  |      | 30         |
| Perfluorononanesulfonic Acid (PFNS)   | 125       |      | 110       |      | 69-125           | 13  |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | 138       |      | 110       |      | 63-144           | 23  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | 119       |      | 100       |      | 64-136           | 17  |      | 30         |
| Perfluorodecane sulfonic Acid (PFDS)  | 128       |      | 103       |      | 59-134           | 20  |      | 30         |
| Perfluorooctanesulfonamide (FOSA)   | 129       |      | 106       |      | 67-137           | 16  |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | 115       |      | 94        |      | 61-139           | 20  |      | 30         |
| Perfluorododecanoic Acid (PFDoA)  | 128       |      | 107       |      | 69-135           | 16  |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02-03,07-08 Batch: WG1401095-2 WG1401095-3 |           |      |           |      |                  |     |      |            |
| Perfluorotridecanoic Acid (PFTrDA)  | 115       |      | 98        |      | 66-139           | 16  |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | 110       |      | 96        |      | 68-133           | 14  |      | 30         |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)   | 112       |      | 94        |      | 50-150           | 17  |      | 30         |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)   | 113       |      | 100       |      | 50-150           | 12  |      | 30         |
| Perfluorohexadecanoic Acid (PFHxDA)   | 89        |      | 75        |      | 50-150           | 17  |      | 30         |
| Perfluorooctadecanoic Acid (PFODA)  | 81        |      | 64        |      | 50-150           | 23  |      | 30         |
| Perfluorododecane Sulfonic Acid (PFDS)  | 131       |      | 114       |      | 50-150           | 14  |      | 30         |
| 1H,1H,2H,2H-Perfluorododecane sulfonic Acid (10:2FTS)   | 201       | Q    | 175       | Q    | 50-150           | 14  |      | 30         |
| 9-Chlorohexadecafluoro-3-Oxanon-1-Sulfonic Acid (9Cl-PF9ONS)  | 102       |      | 93        |      | 50-150           | 9   |      | 30         |
| 11-Chlorooctadecafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF10US)   | 64        |      | 81        |      | 50-150           | 4   |      | 30         |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | 60        |      | 122       |      | 50-150           | 42  | Q    | 30         |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | 105       |      | 148       |      | 50-150           | 34  | Q    | 30         |
| N-Methyl Perfluorooctanesulfonamide Ethanol (NMeFOSE)   | 135       |      | 163       | Q    | 50-150           | 30  |      | 30         |
| N-Ethyl Perfluorooctanesulfonamide Ethanol (NEFOSE)   | 133       |      | 166       | Q    | 50-150           | 29  |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/25/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | RPD  |        |
|---|-----------|------|-----------|------|------------------|-----|------|--------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     | Qual | Limits |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02-03,07-08 Batch: WG1401095-2 WG1401095-3 |           |      |           |      |                  |     |      |        |

| Surrogate (Extracted Internal Standard)  | LCS       |      | LCSD      |      | Acceptance Criteria |
|--|-----------|------|-----------|------|---------------------|
|  | %Recovery | Qual | %Recovery | Qual |                     |
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 66        |      | 81        |      | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 75        |      | 91        |      | 65-192              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 74        |      | 86        |      | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 292       | Q    | 343       | Q    | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 62        |      | 74        |      | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 65        |      | 79        |      | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 76        |      | 89        |      | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFDA)  | 68        |      | 80        |      | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 289       | Q    | 332       | Q    | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 66        |      | 78        |      | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 73        |      | 84        |      | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 66        |      | 80        |      | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 354       | Q    | 410       | Q    | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 109       |      | 141       | Q    | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 62        | Q    | 77        |      | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 47        |      | 56        |      | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                    | 132       |      | 161       | Q    | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (M2PFDOA)   | 57        |      | 66        |      | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 53        |      | 62        |      | 26-180              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 79        |      | 90        |      | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 61        |      | 75        |      | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 7         | Q    | 6         | Q    | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                    | 5         | Q    | 5         | Q    | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 12        | Q    | 13        | Q    | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                     | 8         | Q    | 8         | Q    | 50-150              |



Project Name: PFAS STUDY  
 Project Number: Not Specified

Serial\_No:08252013:49  
 Lab Number: L2032501  
 Report Date: 08/25/20

**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

**Cooler Information**

|               |                     |
|---------------|---------------------|
| <b>Cooler</b> | <b>Custody Seal</b> |
| A             | Absent              |
| B             | Absent              |

**Container Information**

| Container ID | Container Type  | Cooler | Initial pH | Final pH | Temp deg C | Pres | Seal   | Frozen Date/Time | Analysis(*)               |
|--------------|---|--------|------------|----------|------------|------|--------|------------------|---------------------------|
| L2032501-01A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(14);    |
| L2032501-01B | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(14);    |
| L2032501-02A | Plastic 8oz unpreserved                                 | A      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-36(28);    |
| L2032501-03A | Plastic 8oz unpreserved                                 | A      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-36(28);    |
| L2032501-04A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 3.0        | Y    | Absent |                  | A2-L-EXT-537-ISOTOPE(14); |
| L2032501-05A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(14);    |
| L2032501-05B | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(14);    |
| L2032501-06A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | B      | NA         |          | 3.0        | Y    | Absent |                  | A2 L-EXT-537-ISOTOPE(14); |
| L2032501-07A | Plastic 8oz unpreserved                                 | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(28);    |
| L2032501-07B | Plastic 8oz unpreserved                                 | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(28);    |
| L2032501-08A | Plastic 8oz unpreserved                                 | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(28);    |
| L2032501-09A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(14);    |
| L2032501-10A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(14);    |
| L2032501-10B | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(14);    |
| L2032501-11A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE(14);       |
| L2032501-12A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE(14);       |
| L2032501-12B | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE(14);       |

\*Values in parentheses indicate holding time in days



Project Name: PFAS STUDY  
 Project Number:

Serial\_No:08252013:49  
 Lab Number: L2032501  
 Report Date: 08/25/20

**PFAS PARAMETER SUMMARY**

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



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

## GLOSSARY

### Acronyms

|                 |  |
|-----------------|--|
| <b>DL</b>       | - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  |
| <b>EDL</b>      | - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME)  |
| <b>EMPC</b>     | - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.   |
| <b>EPA</b>      | - Environmental Protection Agency.   |
| <b>LCS</b>      | - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.  |
| <b>LCSd</b>     | - Laboratory Control Sample Duplicate: Refer to LCS.   |
| <b>LIB</b>      | - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.   |
| <b>LOD</b>      | - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)   |
| <b>LOQ</b>      | - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)<br><br>Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) |
| <b>MDL</b>      | - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.  |
| <b>MS</b>       | - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 3320, the spike recovery is calculated using the native concentration, including estimated values.   |
| <b>MSD</b>      | - Matrix Spike Sample Duplicate: Refer to MS.  |
| <b>NA</b>       | - Not Applicable.  |
| <b>NC</b>       | - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.   |
| <b>NDPA/DPA</b> | - N-Nitrosodiphenylamine/Diphenylamine.  |
| <b>NI</b>       | - Not Identifiable.  |
| <b>NP</b>       | - Non-Plastic: Term is utilized for the analysis of Atracberg Limits in soil.  |
| <b>RI</b>       | - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RI includes any adjustments from dilutions, concentrations or moisture content, where applicable.   |
| <b>RPD</b>      | - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values, although the RPD value will be provided in the report.  |
| <b>SRM</b>      | - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.   |
| <b>STLP</b>     | - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.  |
| <b>TEF</b>      | - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.   |
| <b>TEQ</b>      | - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.  |
| <b>TIC</b>      | - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.  |

### Footnotes

Report Format: Data Usability Report



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

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

**Terms**

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1.8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

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

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

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 18 hours from sample collection, value will be reflected in **bold**.

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

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

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (S)' result is defined as the summation of results for: PFOA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

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

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

**Data Qualifiers**

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

Report Format: Data Usability Report



**Project Name:** PFAS STUDY

**Lab Number:** L2032501

**Project Number:** Not Specified

**Report Date:** 08/25/20

**Data Qualifiers**

Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only)

- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/25/20

**REFERENCES**

- 134 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) using Isotope Dilution. Alpha SOP 23528.

**LIMITATION OF LIABILITIES**

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

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





### Certification Information

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

**Westborough Facility**

**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene  
**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene, SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene.  
**EPA 8270D:** NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.  
**SM1500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

**Mansfield Facility**

**SM 2540D:** TSS  
**EPA 8082A:** NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.  
**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.  
**EPA TO-12** Non-methane organics  
**EPA 3C** Fixed gases  
**Biological Tissue Matrix:** EPA 3050B

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

**Westborough Facility:**

**Drinking Water**

**EPA 300.6:** Chloride, Nitrate-N, Fluoride, Sulfate, **EPA 353.2:** Nitrate-N, Nitrite-N, **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM1500H-B, SM4500NO2-B**  
**EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.  
**Microbiology:** **SM9215B, SM9223-P/A, SM9223B-Colilert-QT,SM9222D.**

**Non-Potable Water**

**SM4500H.B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LCHAT 10-107-06-1-B,** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.  
**EPA 624.1** Volatile Halocarbons & Aromatics,  
**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs  
**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil  
**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

**Mansfield Facility:**

**Drinking Water**

**EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg, EPA 522.**

**Non-Potable Water**

**EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.  
**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.  
**EPA 245.1 Hg, SM2340B**

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



ANALYTICAL REPORT

|                 |  |
|-----------------|--|
| Lab Number:     | L2032501   |
| Client:         | Maryland Department of the Environment<br>1800 Washington Boulevard<br>Baltimore, MD 21230 |
| ATTN:           | Amy Laliberte  |
| Phone:          | (410) 537-3614   |
| Project Name:   | PFAS STUDY   |
| Project Number: | Not Specified  |
| Report Date:    | 08/31/20   |

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

Certifications & Approvals: MA (M MA030), NH NELAP (2062), CT (PH 0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA0030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68 02089), RI (LA000299), TX (T104704419), VT (VT 0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330 17 00150), USFWS (Permit #206964).

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



Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/31/20

| Alpha Sample ID | Client ID | Matrix | Sample Location | Collection Date/Time | Receive Date |
|-----------------|-----------|--------|-----------------|----------------------|--------------|
| L2032501-01     | FB-W1     | WATER  | Not Specified   | 08/11/20 09:36       | 08/11/20     |
| L2032501-02     | FB-01     | TISSUE | Not Specified   | 08/11/20 09:36       | 08/11/20     |
| L2032501-03     | FB-01L    | TISSUE | Not Specified   | 08/11/20 09:36       | 08/11/20     |
| L2032501-04     | TB-201    | WATER  | Not Specified   | 08/11/20 06:30       | 08/11/20     |
| L2032501-05     | FB-7A     | WATER  | Not Specified   | 08/11/20 09:36       | 08/11/20     |
| L2032501-06     | TB-200    | WATER  | Not Specified   | 08/11/20 06:00       | 08/11/20     |
| L2032501-07     | HP-01L    | TISSUE | Not Specified   | 08/11/20 10:00       | 08/11/20     |
| L2032501-08     | HP-01     | TISSUE | Not Specified   | 08/11/20 10:00       | 08/11/20     |
| L2032501-09     | FB-9A     | WATER  | Not Specified   | 08/11/20 10:00       | 08/11/20     |
| L2032501-10     | HP-W1     | WATER  | Not Specified   | 08/11/20 10:00       | 08/11/20     |
| L2032501-11     | FB-9B     | WATER  | Not Specified   | 08/11/20 09:00       | 08/11/20     |
| L2032501-12     | DP-W1     | WATER  | Not Specified   | 08/11/20 09:00       | 08/11/20     |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

### Case Narrative

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

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

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

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

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

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

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**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**Case Narrative (continued)**

**Report Submission**

August 31, 2020: Final report.

August 25, 2020: This is a preliminary report.

**Perfluorinated Alkyl Acids by Isotope Dilution**

L2032501-01, -01(MEOH), -05 and -05(MEOH): Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

L2032501-02, -03, -07, -08, and -10: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

L2032501-09, -09(MEOH) -10 and -10(MEOH): Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

L2032501-01(MEOH): The MeOH fraction of the extraction is reported for the following compounds:

Perfluorooctanesulfonamide (FOSA), N-Methyl Perfluorooctane Sulfonamide (NMeFOSA), N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA), N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE), and N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE) due to better extraction efficiency of the Surrogates (Extracted Internal Standards).

L2032501-05(MEOH): The MeOH fraction of the extraction is reported for the following compounds: N-Methyl Perfluorooctane Sulfonamide (NMeFOSA), N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA) due to better extraction efficiency of the Surrogates (Extracted Internal Standards).

L2032501-09(MEOH): The MeOH fraction of the extraction is reported for the following compounds: , N-Methyl Perfluorooctane Sulfonamide (NMeFOSA), N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA) due to better extraction efficiency of the Surrogates (Extracted Internal Standards).

L2032501-10(MEOH): The MeOH fraction of the extraction is reported for the following compounds: N-Methyl Perfluorooctane Sulfonamide (NMeFOSA), N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA), N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE), and N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE) due to better extraction efficiency of the Surrogates (Extracted Internal Standards).

WG1399517-1(MEOH), WG1399517-2(MeOH) and WG1399517-3(MEOH): Extracted Internal Standard

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

### Case Narrative (continued)

recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

WG1399517-1, WG1399517-2, WG1399517-3, WG1401095-1, WG1401095-2 and WG1401095-3:

Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

The WG1399985-1 Method Blank, associated with L2032501-11, and -12, has a concentration above the reporting limit for PFOS. Since the sample(s) were non-detect to the RL for this target analyte, no further actions were taken. The results of the original analysis are reported.

The WG1399517-2 LCS recovery, associated with L2032501-05, -09, and -10, is above the acceptance criteria for 1h,1h,2h,2h-perfluorododecanesulfonic acid (10:2fts) (188%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

The WG1399517-3 LCS recoveries, associated with L2032501-05, -09, and -10, are above the acceptance criteria for 1h,1h,2h,2h-perfluorododecanesulfonic acid (10:2fts) (189%) and n-ethyl perfluorooctanesulfonamido ethanol (netfose) (172%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

The WG1399517-2/-3(MEOH) LCS/LCSD RPD, associated with L2032501-05, -09, and -10, is above the acceptance criteria for n-ethyl perfluorooctanesulfonamido ethanol (netfose) (40%).

The WG1401095-2 LCS recovery, associated with L2032501-02, -03, -07, and -08, is above the acceptance criteria for 1h,1h,2h,2h-perfluorododecanesulfonic acid (10:2fts) (201%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

The WG1401095-3 LCSD recoveries, associated with L2032501-02, -03, -07, and -08, are above the acceptance criteria for 1h,1h,2h,2h-perfluorododecanesulfonic acid (10:2fts) (175%), n-methyl perfluorooctanesulfonamido ethanol (nmefose) (183%) and n-ethyl perfluorooctanesulfonamido ethanol (netfose) (189%); however, the associated samples are non-detect to the RL for these target analytes. The results of the original analysis are reported.

The WG1401095-2/-3 LCS/LCSD RPD(s), associated with L2032501-02, -03, -07, and -08, are above the acceptance criteria for n-methyl perfluorooctane sulfonamide (nmefosa) (42%) and n-ethyl perfluorooctane

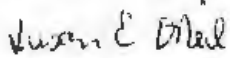
**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**Case Narrative (continued)**

sulfonamide (netfosa) (34%).

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

Authorized Signature:  Susan O'Neil

Title: Technical Director/Representative

Date: 08/31/20

# ORGANICS





# SEMIVOLATILES



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-01  
**Client ID:** FB-W1  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/20/20 00:44  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |      |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | 3.61   |           | ng/l  | 1.80 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.52   |           | ng/l  | 1.80 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPS)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | 3.07   |           | ng/l  | 1.80 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | 3.20   |           | ng/l  | 1.80 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)                           | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/l  | 45.1 | --  | 1               |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/l  | 3.61 | --  | 1               |
| Perfluorooctadecanoic Acid (PFODA)  | ND     |           | ng/l  | 3.61 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-01  
**Client ID:** FB-W1  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/l  | 1.80 | -   | 1               |
| 1H,1H,2H,2H Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/l  | 4.51 | -   | 1               |
| 9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)         | ND     |           | ng/l  | 1.80 | -   | 1               |
| 11-Chloroicosafafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUDS)   | ND     |           | ng/l  | 1.80 | -   | 1               |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 45         |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 40         |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 74         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 104        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 27         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 32         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 83         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 31         | O         | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 81         |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 29         | O         | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 65         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 31         | O         | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 61         |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 27         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 37         | Q         | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 1          |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 24         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 35         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 38         |           | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 23         | O         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 51         |           | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

Lab ID: L2032501-01  
 Client ID: FB-W1  
 Sample Location: Not Specified

Date Collected: 08/11/20 09:36  
 Date Received: 08/11/20  
 Field Prep: Not Specified

Sample Depth:  
 Matrix: Water  
 Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 08/20/20 14:00  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorooctanesulfonamide (FOSA)                                     | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/l  | 18.0 | --  | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/l  | 18.0 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/l  | 45.1 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/l  | 45.1 | --  | 1               |

| Surrogate (Extracted Internal Standard)                               | % Recovery | Qualifier | Acceptance Criteria |
|---|------------|-----------|---------------------|
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                             | 6          |           | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 6          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                 | 6          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 9          | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)  | 8          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-02  
**Client ID:** FB-01  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/22/20 05:05  
**Analyst:** JW  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/20/20 14:15

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |       |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                          | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)   | ND     |           | ng/g  | 0.980 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/g  | 9.80  | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/g  | 0.980 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/g  | 1.96  | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

Lab ID: L2032501-02  
 Client ID: FB-01  
 Sample Location: Not Specified

Date Collected: 08/11/20 09:36  
 Date Received: 08/11/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/g  | 1.96  | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/g  | 0.980 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/g  | 0.980 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)       | ND     |           | ng/g  | 0.980 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/g  | 0.980 | --  | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/g  | 0.980 | -   | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/g  | 0.980 | -   | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/g  | 1.96  | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/g  | 1.96  | -   | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-02  
**Client ID:** FB-01  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 58         | Q         | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 61         | Q         | 65-182              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 66         | Q         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 157        | Q         | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 54         | Q         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 60         | Q         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 70         |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 57         | Q         | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 179        |           | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 60         | Q         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 64         | Q         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 57         | Q         | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 223        | Q         | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 81         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                 | 62         | Q         | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 18         |           | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                    | 93         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 56         |           | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 49         |           | 26-160              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 90         |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 44         | Q         | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 5          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                    | 6          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 10         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                     | 5          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-03  
**Client ID:** FB-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/22/20 05:22  
**Analyst:** JW  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/20/20 14:15

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |       |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | 1.57   |           | ng/g  | 0.943 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                          | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)   | ND     |           | ng/g  | 0.943 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/g  | 9.43  | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/g  | 0.943 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/g  | 1.89  | --  | 1               |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

Lab ID: L2032501-03  
 Client ID: FB-01L  
 Sample Location: Not Specified

Date Collected: 08/11/20 09:36  
 Date Received: 08/11/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/g  | 1.89  | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/g  | 0.943 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/g  | 0.943 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxaonone-1-Sulfonic Acid (9Cl-PF3ONS)        | ND     |           | ng/g  | 0.943 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/g  | 0.943 | -   | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/g  | 0.943 | -   | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/g  | 0.943 | -   | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/g  | 1.89  | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/g  | 1.89  | -   | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-03  
**Client ID:** FB-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 53         | Q         | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 57         | Q         | 65-182              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 58         | Q         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 124        |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 50         | Q         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 54         | Q         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 62         | Q         | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 52         | Q         | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 145        |           | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 55         | Q         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 59         | Q         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 52         | Q         | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 178        |           | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 68         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                 | 56         | Q         | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 18         |           | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                    | 78         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 51         | Q         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 42         |           | 26-160              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 88         |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 38         | Q         | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 6          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                    | 6          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 12         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                     | 6          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-05  
**Client ID:** FB-7A  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/20/20 01:00  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |      |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                          | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)   | ND     |           | ng/l  | 1.80 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/l  | 45.1 | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/l  | 1.80 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/l  | 3.60 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-05  
**Client ID:** FB-7A  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:36  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/l  | 3.60 | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/l  | 1.80 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/l  | 4.51 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)         | ND     |           | ng/l  | 1.80 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/l  | 1.80 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/l  | 45.1 | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEFOSE)                   | ND     |           | ng/l  | 45.1 | -   | 1               |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 39         |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 39         |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 70         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 37         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 33         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 40         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 76         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 40         |           | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 47         |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 39         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 73         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 45         |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 56         |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 45         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 58         |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 30         |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 47         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 53         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 45         |           | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 43         | Q         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 54         |           | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 16         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)                     | 11         | Q         | 50-150              |



Serial\_No:08312016:38

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

Lab ID: L2032501-05  
Client ID: FB-7A  
Sample Location: Not Specified

Date Collected: 08/11/20 09:36  
Date Received: 08/11/20  
Field Prep: Not Specified

Sample Depth:  
Matrix: Water  
Analytical Method: 134,LCMSMS-ID  
Analytical Date: 08/20/20 14:17  
Analyst: JW

Extraction Method: ALPHA 23528  
Extraction Date: 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/l  | 18.0 | --  | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/l  | 18.0 | --  | 1               |

| Surrogate (Extracted Internal Standard)                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA) | 4          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)  | 4          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-07  
**Client ID:** HP-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/22/20 05:38  
**Analyst:** JW  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/20/20 14:15

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |       |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                          | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)   | ND     |           | ng/g  | 0.964 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/g  | 9.64  | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/g  | 0.964 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/g  | 1.93  | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

Lab ID: L2032501-07  
 Client ID: HP-01L  
 Sample Location: Not Specified

Date Collected: 08/11/20 10:00  
 Date Received: 08/11/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/g  | 1.93  | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/g  | 0.964 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/g  | 0.964 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanonone-1-Sulfonic Acid (9Cl-PF3ONS)       | ND     |           | ng/g  | 0.964 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/g  | 0.964 | --  | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/g  | 0.964 | -   | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/g  | 0.964 | -   | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/g  | 1.93  | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/g  | 1.93  | -   | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-07  
**Client ID:** HP-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 48         | Q         | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 51         | Q         | 65-182              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 54         | Q         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 134        |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 45         | Q         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 49         | Q         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 56         | Q         | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 47         | Q         | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 157        |           | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 49         | Q         | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 53         | Q         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 46         | Q         | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 230        | Q         | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 77         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                 | 48         | Q         | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 16         |           | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                    | 82         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 41         | Q         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 38         |           | 26-160              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 76         |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 32         | Q         | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 4          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                    | 4          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 8          | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                     | 5          | Q         | 50-150              |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-08  
**Client ID:** HP-01  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/22/20 05:55  
**Analyst:** JW  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/20/20 14:15

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>             |        |           |       |       |     |                 |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                 | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                 | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                 | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                         | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                          | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)   | ND     |           | ng/g  | 0.901 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA) | ND     |           | ng/g  | 9.01  | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)                                       | ND     |           | ng/g  | 0.901 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/g  | 1.80  | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

Lab ID: L2032501-08  
 Client ID: HP-01  
 Sample Location: Not Specified

Date Collected: 08/11/20 10:00  
 Date Received: 08/11/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/g  | 1.80  | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/g  | 0.901 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/g  | 0.901 | -   | 1               |
| 9-Chlorohexadecafluoro-3-Oxaone-1-Sulfonic Acid (9Cl-PF3ONS)          | ND     |           | ng/g  | 0.901 | -   | 1               |
| 11-Chloroicosatruo-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)       | ND     |           | ng/g  | 0.901 | -   | 1               |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/g  | 0.901 | -   | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/g  | 0.901 | -   | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/g  | 1.80  | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/g  | 1.80  | -   | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-08  
**Client ID:** HP-01  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 58         | Q         | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 60         | Q         | 65-182              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 66         | Q         | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                             | 169        | Q         | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 55         | Q         | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 60         | Q         | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)   | 70         |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 59         | Q         | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                             | 191        | Q         | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 62         |           | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 63         | Q         | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 56         | Q         | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                             | 261        | Q         | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                     | 91         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                   | 61         | Q         | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 21         |           | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                      | 82         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 52         | Q         | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 43         |           | 26-160              |
| 2,3,3,3-Tetrafluoro-2-[1,1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 101        |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 34         | Q         | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                     | 7          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                      | 7          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                      | 12         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                       | 5          | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-09  
**Client ID:** FB-9A  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/20/20 01:17  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/17/20 12:25

| Parameter  | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|--|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>              |        |           |       |      |     |                 |
| Perfluorobutanoic Acid (PFBA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)   | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorononanoic Acid (PFNA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                          | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)   | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                           | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)   | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoro(propoxy)-Propanoic Acid (HFPO-DA) | ND     |           | ng/l  | 43.9 | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)  | ND     |           | ng/l  | 3.51 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-09  
**Client ID:** FB-9A  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/l  | 3.51 | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/l  | 1.78 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/l  | 4.39 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)         | ND     |           | ng/l  | 1.76 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)     | ND     |           | ng/l  | 1.78 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/l  | 43.9 | -   | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEFOSE)                   | ND     |           | ng/l  | 43.9 | -   | 1               |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 51         |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 48         |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 75         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 41         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 42         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 51         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 80         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 53         |           | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 47         |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 52         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 77         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 60         |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 56         |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 54         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 73         |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 41         |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 53         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 67         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 54         |           | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 50         |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 64         |           | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 27         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)                     | 21         | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

Lab ID: L2032501-09  
 Client ID: FB-9A  
 Sample Location: Not Specified

Date Collected: 08/11/20 10:00  
 Date Received: 08/11/20  
 Field Prep: Not Specified

Sample Depth:  
 Matrix: Water  
 Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 08/20/20 14:33  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/l  | 17.8 | --  | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/l  | 17.6 | --  | 1               |

| Surrogate (Extracted Internal Standard)                               | % Recovery | Qualifier | Acceptance Criteria |
|---|------------|-----------|---------------------|
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                             | 7          |           | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 5          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                 | 5          | O         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 10         | O         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)  | 13         | O         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-10  
**Client ID:** HP-W1  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/20/20 01:33  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/17/20 12:25

| Parameter  | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|--|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b>              |        |           |       |      |     |                 |
| Perfluorobutanoic Acid (PFBA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoropentanoic Acid (PFPeA)  | 2.38   |           | ng/l  | 1.76 | --  | 1               |
| Perfluorobutanesulfonic Acid (PFBS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)                                  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)   | 2.14   |           | ng/l  | 1.76 | --  | 1               |
| Perfluoropentanesulfonic Acid (PFPeS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)  | 2.10   |           | ng/l  | 1.76 | --  | 1               |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)                                  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoroheptanesulfonic Acid (PFHpS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorononanoic Acid (PFNA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)  | 2.03   |           | ng/l  | 1.76 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)                                  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorononanesulfonic Acid (PFNS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)                          | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)   | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorodecanesulfonic Acid (PFDS)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorooctanesulfonamide (FOSA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)                           | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)   | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTeA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoro(propoxy)-Propanoic Acid (HFPO-DA) | ND     |           | ng/l  | 44.1 | --  | 1               |
| 4,6-Dioxo-3h-Perfluorononanoic Acid (ADONA)  | ND     |           | ng/l  | 1.76 | --  | 1               |
| Perfluorohexadecanoic Acid (PFHxDA)  | ND     |           | ng/l  | 3.53 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-10  
**Client ID:** HP-W1  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 10:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorooctadecanoic Acid (PFODA)                                    | ND     |           | ng/l  | 3.53 | -   | 1               |
| Perfluorododecane Sulfonic Acid (PFDoDS)                              | ND     |           | ng/l  | 1.78 | -   | 1               |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)                  | ND     |           | ng/l  | 4.41 | -   | 1               |
| 9-Chlorohexadecafluoro-9-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)         | ND     |           | ng/l  | 1.76 | -   | 1               |
| 11-Chloroicosatluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUDS)     | ND     |           | ng/l  | 1.78 | --  | 1               |

| Surrogate (Extracted Internal Standard)  | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 23         |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 20         |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 70         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 75         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 15         | Q         | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 20         | Q         | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 78         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 21         | Q         | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 64         |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 23         | Q         | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 68         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 32         | Q         | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 57         |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 60         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 39         | Q         | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 7          |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 57         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 41         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 46         |           | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 15         | Q         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 62         |           | 50-150              |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

Lab ID: L2032501-10  
 Client ID: HP-W1  
 Sample Location: Not Specified

Date Collected: 08/11/20 10:00  
 Date Received: 08/11/20  
 Field Prep: Not Specified

Sample Depth:  
 Matrix: Water  
 Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 08/20/20 14:50  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)                        | ND     |           | ng/l  | 17.6 | --  | 1               |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)                         | ND     |           | ng/l  | 17.6 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)                 | ND     |           | ng/l  | 44.1 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)                  | ND     |           | ng/l  | 44.1 | --  | 1               |

| Surrogate (Extracted Internal Standard)                               | % Recovery | Qualifier | Acceptance Criteria |
|---|------------|-----------|---------------------|
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 5          | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                 | 7          | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 10         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)  | 13         | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

Lab ID: L2032501-11  
 Client ID: FB-9B  
 Sample Location: Not Specified

Date Collected: 08/11/20 09:00  
 Date Received: 08/11/20  
 Field Prep: Not Specified

Sample Depth:  
 Matrix: Water  
 Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 08/19/20 13:28  
 Analyst: SG

Extraction Method: ALPHA 23528  
 Extraction Date: 08/18/20 11:10

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.78 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.78 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.78 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.78 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

Lab ID: L2032501-11  
 Client ID: FB-9B  
 Sample Location: Not Specified

Date Collected: 08/11/20 09:00  
 Date Received: 08/11/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 82         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 52         |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 67         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 78         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 90         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 80         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 74         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 83         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 79         |           | 58-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 79         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 100        |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 78         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 93         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 68         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

**Lab ID:** L2032501-12  
**Client ID:** DP-W1  
**Sample Location:** Not Specified

**Date Collected:** 08/11/20 09:00  
**Date Received:** 08/11/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/19/20 13:44  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/18/20 11:10

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | 2.06   |           | ng/l  | 1.84 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.84 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.84 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.84 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.84 | --  | 1               |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**SAMPLE RESULTS**

Lab ID: L2032501-12  
 Client ID: DP-W1  
 Sample Location: Not Specified

Date Collected: 08/11/20 09:00  
 Date Received: 08/11/20  
 Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 85         |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 111        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 70         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 86         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 96         |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 85         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 77         |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 81         |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 77         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 80         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 88         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 87         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 85         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 72         |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 08/19/20 21:58  
 Analyst: SG

Extraction Method: ALPHA 23528  
 Extraction Date: 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01,05,09-10 Batch: WG1399517-1</b> |        |           |       |      |     |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorodecane sulfonic Acid (8:2FTS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorodecane sulfonic Acid (PFDS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/l  | 2.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotridecanoic Acid (PFTTrDA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/l  | 2.00 | --  |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy] Propanoic Acid (HFPO-DA)                                   | ND     |           | ng/l  | 50.0 | --  |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)   | ND     |           | ng/l  | 2.00 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 08/19/20 21:58  
 Analyst: SG

Extraction Method: ALPHA 23528  
 Extraction Date: 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01,05,09-10 Batch: WG1399517-1</b> |        |           |       |      |     |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/l  | 4.00 | --  |
| Perfluorooctadecanoic Acid (PFODA)  | ND     |           | ng/l  | 4.00 | --  |
| Perfluorododecane Sulfonic Acid (PFDoDS)  | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2F7S)  | ND     |           | ng/l  | 5.00 | --  |
| 9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)   | ND     |           | ng/l  | 2.00 | --  |
| 11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)  | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | ND     |           | ng/l  | 20.0 | --  |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)   | ND     |           | ng/l  | 20.0 | --  |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)   | ND     |           | ng/l  | 50.0 | --  |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)  | ND     |           | ng/l  | 50.0 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 08/19/20 21:58  
 Analyst: SG

Extraction Method: ALPHA 23528  
 Extraction Date: 08/17/20 12:25

| Parameter  | Result | Qualifier | Units | RL | MDL |
|--|--------|-----------|-------|----|-----|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01,05,09-10 Batch: WG1399517-1 |        |           |       |    |     |

| Surrogate (Extracted Internal Standard)  | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 53        |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 47        |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 72        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 50        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 45        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 53        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 79        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 54        |           | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 58        |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 53        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 79        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 61        |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 66        |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 57        |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                 | 78        |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 50        |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 52        |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 72        |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 67        |           | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 38        | Q         | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 94        |           | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 5         | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                                    | 4         | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 35        | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)                     | 29        | Q         | 50-150              |





**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 08/20/20 12:54  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 08/17/20 12:25

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01,05,09-10 Batch: WG1399517-1</b> |        |           |       |      |     |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | ND     |           | ng/l  | 20.0 | --  |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | ND     |           | ng/l  | 20.0 | --  |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)   | ND     |           | ng/l  | 50.0 | --  |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEFOSE)   | ND     |           | ng/l  | 50.0 | --  |

| Surrogate (Extracted Internal Standard)                               | %Recovery | Qualifier | Acceptance Criteria |
|---|-----------|-----------|---------------------|
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                             | 6         |           | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 3         | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEFOSA)                  | 3         | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 6         | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEFOSE)   | 7         | Q         | 50-150              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 08/19/20 11:20  
 Analyst: SG

Extraction Method: ALPHA 23528  
 Extraction Date: 08/18/20 11:10

| Parameter  | Result | Qualifier | Units | RL   | MDL |
|--|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 11-12 Batch: WG139985-1</b> |        |           |       |      |     |
| Perfluorobutanoic Acid (PFBA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoropentanoic Acid (PFPeA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorobutanesulfonic Acid (PFBS)  | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanoic Acid (PFHxA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoropentanesulfonic Acid (PFPeS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanoic Acid (PFOA)  | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanesulfonic Acid (PFHpS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanoic Acid (PFNA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)  | 9.62   |           | ng/l  | 2.00 | --  |
| Perfluorodecanoic Acid (PFDA)  | ND     |           | ng/l  | 2.00 | --  |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanesulfonic Acid (PFNS)  | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorodecanesulfonic Acid (PFDS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonamide (FOSA)  | ND     |           | ng/l  | 2.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDoA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)   | ND     |           | ng/l  | 2.00 | --  |
| PFOA/PFOS, Total   | 9.62   |           | ng/l  | 2.00 | --  |
| PFAS, Total (5)  | 9.62   |           | ng/l  | 2.00 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 08/19/20 11:20  
 Analyst: SG

Extraction Method: ALPHA 23528  
 Extraction Date: 08/18/20 11:10

| Parameter  | Result | Qualifier | Units | RL | MDL |
|--|--------|-----------|-------|----|-----|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 11-12 Batch: WG1399985-1 |        |           |       |    |     |

| Surrogate (Extracted Internal Standard)                                | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)                                   | 82        |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)                                | 74        |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 82        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)         | 50        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 65        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 77        |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 91        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 79        |           | 38-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)         | 61        |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 71        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 86        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 79        |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)         | 67        |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 91        |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 99        |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                              | 41        |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 61        |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 88        |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 77        |           | 33-143              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 08/22/20 02:36  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 08/20/20 14:15

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 02-03,07-08 Batch: WG1401095-1</b> |        |           |       |      |     |
| Perfluorobutanoic Acid (PFBA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluoropentanoic Acid (PFPeA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/g  | 1.00 | --  |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluoropentanesulfonic Acid (PFPeS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 1.00 | --  |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluoroheptanesulfonic Acid (PFHpS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 1.00 | --  |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorononanesulfonic Acid (PFNS)   | ND     |           | ng/g  | 1.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorodecanesulfonic Acid (PFDS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorooctanesulfonamide (FOSA)   | ND     |           | ng/g  | 1.00 | --  |
| N-Ethyl Perfluorooctanesulfonamideacetic Acid (NEFOSAA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/g  | 1.00 | --  |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy] Propanoic Acid (HFPO-DA)                                   | ND     |           | ng/g  | 10.0 | --  |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)   | ND     |           | ng/g  | 1.00 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 08/22/20 02:36  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 08/20/20 14:15

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 02-03,07-08 Batch: WG1401095-1</b> |        |           |       |      |     |
| Perfluorohexadecanoic Acid (PFHxDA)   | ND     |           | ng/g  | 2.00 | --  |
| Perfluorooctadecanoic Acid (PFODA)  | ND     |           | ng/g  | 2.00 | --  |
| Perfluorododecane Sulfonic Acid (PFDoDS)  | ND     |           | ng/g  | 1.00 | --  |
| 1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2F7S)  | ND     |           | ng/g  | 1.00 | --  |
| 9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)   | ND     |           | ng/g  | 1.00 | --  |
| 11-Chloroicosaffluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)  | ND     |           | ng/g  | 1.00 | --  |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | ND     |           | ng/g  | 1.00 | --  |
| N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)   | ND     |           | ng/g  | 1.00 | --  |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)   | ND     |           | ng/g  | 2.00 | --  |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)  | ND     |           | ng/g  | 2.00 | --  |



**Lab Control Sample Analysis**  
Batch Quality Control

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,05,09-10 Batch: WG1399517-2 WG1399517-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanoic Acid (PFBA)   | 110       |      | 112       |      | 67-148           | 2   |      | 30         |
| Perfluoropentanoic Acid (PFPeA)   | 107       |      | 108       |      | 63-181           | 1   |      | 30         |
| Perfluorobutanesulfonic Acid (PFBS)   | 114       |      | 114       |      | 65-157           | 0   |      | 30         |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | 107       |      | 113       |      | 37-219           | 5   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 114       |      | 116       |      | 69-188           | 2   |      | 30         |
| Perfluoropentanesulfonic Acid (PFPeS)   | 101       |      | 100       |      | 52-156           | 1   |      | 30         |
| Perfluorheptanoic Acid (PFHpA)  | 112       |      | 111       |      | 58-159           | 1   |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | 111       |      | 112       |      | 69-177           | 1   |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 119       |      | 120       |      | 63-159           | 1   |      | 30         |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (8:2FTS)   | 127       |      | 130       |      | 49-187           | 2   |      | 30         |
| Perfluorooheptanesulfonic Acid (PFHpS)  | 116       |      | 108       |      | 61-179           | 7   |      | 30         |
| Perfluorononanoic Acid (PFNA)   | 113       |      | 117       |      | 68-171           | 3   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 116       |      | 111       |      | 52-151           | 4   |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | 109       |      | 111       |      | 63-171           | 2   |      | 30         |
| 1H,1H,2H,2H-Perfluorodecane sulfonic Acid (8:2FTS)  | 118       |      | 118       |      | 56-173           | 0   |      | 30         |
| Perfluorononanesulfonic Acid (PFNS)   | 134       |      | 118       |      | 48-150           | 13  |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | 111       |      | 128       |      | 60-166           | 14  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | 109       |      | 107       |      | 60-153           | 2   |      | 30         |
| Perfluorodecane sulfonic Acid (PFDS)  | 138       |      | 124       |      | 38-156           | 9   |      | 30         |
| Perfluorooctanesulfonamide (FOSA)   | 112       |      | 117       |      | 46-170           | 4   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | 107       |      | 109       |      | 45-170           | 2   |      | 30         |
| Perfluorododecanoic Acid (PFDoA)  | 121       |      | 122       |      | 67-153           | 1   |      | 30         |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**Method Blank Analysis  
 Batch Quality Control**

**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/22/20 02:36  
**Analyst:** JW

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/20/20 14:15

| Parameter  | Result | Qualifier | Units | RL | MDL |
|--|--------|-----------|-------|----|-----|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 02-03,07-08 Batch: WG1401095-1 |        |           |       |    |     |

| Surrogate (Extracted Internal Standard)  | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 73        |           | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 82        |           | 65-182              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 80        |           | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 297       | Q         | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 66        |           | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 71        |           | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 84        |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 73        |           | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 299       | Q         | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 71        |           | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 80        |           | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 72        |           | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 353       | Q         | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 143       | Q         | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFLUDA)                                 | 69        |           | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 51        |           | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)                    | 140       | Q         | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 59        |           | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 59        |           | 26-160              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 89        |           | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 68        |           | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 5         | Q         | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEtFOSA)                                    | 5         | Q         | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 10        | Q         | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEtFOSE)                     | 7         | Q         | 50-150              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/31/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,05,09-10 Batch: WG1399517-2 WG1399517-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanoic Acid (PFBA)   | 110       |      | 112       |      | 67-148           | 2   |      | 30         |
| Perfluoropentanoic Acid (PFPeA)   | 107       |      | 108       |      | 63-181           | 1   |      | 30         |
| Perfluorobutanesulfonic Acid (PFBS)   | 114       |      | 114       |      | 65-157           | 0   |      | 30         |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | 107       |      | 113       |      | 37-219           | 5   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 114       |      | 116       |      | 69-188           | 2   |      | 30         |
| Perfluoropentanesulfonic Acid (PFPeS)   | 101       |      | 100       |      | 52-156           | 1   |      | 30         |
| Perfluorohexanoic Acid (PFHpA)  | 112       |      | 111       |      | 58-159           | 1   |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | 111       |      | 112       |      | 69-177           | 1   |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 119       |      | 120       |      | 63-159           | 1   |      | 30         |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (8:2FTS)   | 127       |      | 130       |      | 49-187           | 2   |      | 30         |
| Perfluorooheptanesulfonic Acid (PFHpS)  | 116       |      | 108       |      | 61-179           | 7   |      | 30         |
| Perfluorononanoic Acid (PFNA)   | 113       |      | 117       |      | 68-171           | 3   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 116       |      | 111       |      | 52-151           | 4   |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | 109       |      | 111       |      | 63-171           | 2   |      | 30         |
| 1H,1H,2H,2H-Perfluorodecane sulfonic Acid (8:2FTS)  | 118       |      | 118       |      | 56-173           | 0   |      | 30         |
| Perfluorononanesulfonic Acid (PFNS)   | 134       |      | 118       |      | 48-150           | 13  |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | 111       |      | 128       |      | 60-166           | 14  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | 109       |      | 107       |      | 80-153           | 2   |      | 30         |
| Perfluorodecane sulfonic Acid (PFDS)  | 138       |      | 124       |      | 38-156           | 9   |      | 30         |
| Perfluorooctanesulfonamide (FOSA)   | 112       |      | 117       |      | 46-170           | 4   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | 107       |      | 109       |      | 45-170           | 2   |      | 30         |
| Perfluorododecanoic Acid (PFDoA)  | 121       |      | 122       |      | 67-153           | 1   |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/31/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,05,09-10 Batch: WG1399517-2 WG1399517-3 |           |      |           |      |                  |     |      |            |
| Perfluorotridecanoic Acid (PFTrDA)  | 128       |      | 128       |      | 48-158           | 0   |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | 102       |      | 98        |      | 59-182           | 3   |      | 30         |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Hexafluoropropoxy]-Propanoic Acid (HFPO-DA)  | 114       |      | 109       |      | 50-150           | 4   |      | 30         |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)   | 107       |      | 105       |      | 50-150           | 2   |      | 30         |
| Perfluorohexadecanoic Acid (PFHxDA)   | 112       |      | 106       |      | 50-150           | 6   |      | 30         |
| Perfluorooctadecanoic Acid (PFODa)  | 63        |      | 51        |      | 50-150           | 21  |      | 30         |
| Perfluorododecane Sulfonic Acid (PFDS)  | 144       |      | 143       |      | 50-150           | 1   |      | 30         |
| 1H,1H,2H,2H-Perfluorododecane sulfonic Acid (10:2FTS)   | 188       | Q    | 189       | Q    | 50-150           | 1   |      | 30         |
| 9-Chlorohexadecafluoro-3-Oxanon-1-Sulfonic Acid (9Cl-PF9ONS)  | 115       |      | 108       |      | 50-150           | 5   |      | 30         |
| 11-Chlorooctadecafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF30US)   | 116       |      | 107       |      | 50-150           | 8   |      | 30         |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | 96        |      | 115       |      | 50-150           | 18  |      | 30         |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | 100       |      | 100       |      | 50-150           | 0   |      | 30         |
| N-Methyl Perfluorooctanesulfonamide Ethanol (NMeFOSE)   | 133       |      | 141       |      | 50-150           | 6   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamide Ethanol (NEFOSE)   | 150       |      | 172       | Q    | 50-150           | 14  |      | 30         |





**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/31/20

| Parameter   | LCS           |      | LCSD           |      | %Recovery Limits | RPD | Qual | RPD Limits          |
|---|---------------|------|----------------|------|------------------|-----|------|---------------------|
|   | %Recovery     | Qual | %Recovery      | Qual |                  |     |      |                     |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,05,09-10 Batch: WG1399517-2 WG1399517-3 |               |      |                |      |                  |     |      |                     |
| Surrogate (Extracted Internal Standard)   | LCS %Recovery | Qual | LCSD %Recovery | Qual |                  |     |      | Acceptance Criteria |
| Perfluoro[13C4]Butanoic Acid (MPFBA)  | 48            |      | 49             |      |                  |     |      | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)   | 43            |      | 44             |      |                  |     |      | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)   | 69            |      | 74             |      |                  |     |      | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)  | 49            |      | 51             |      |                  |     |      | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)  | 40            |      | 40             |      |                  |     |      | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)   | 47            |      | 48             |      |                  |     |      | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)  | 75            |      | 79             |      |                  |     |      | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)   | 48            |      | 49             |      |                  |     |      | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)  | 57            |      | 60             |      |                  |     |      | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)   | 45            |      | 47             |      |                  |     |      | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)   | 73            |      | 80             |      |                  |     |      | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)   | 52            |      | 56             |      |                  |     |      | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)  | 69            |      | 70             |      |                  |     |      | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)  | 47            |      | 42             |      |                  |     |      | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUOA)   | 64            |      | 71             |      |                  |     |      | 40-144              |
| Perfluoro[13C6]Octanesulfonamide (M6FOSA)   | 50            |      | 45             |      |                  |     |      | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)   | 49            |      | 50             |      |                  |     |      | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (M2PFDOA)  | 61            |      | 66             |      |                  |     |      | 24-181              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEA)   | 60            |      | 64             |      |                  |     |      | 33-143              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)  | 31            | Q    | 34             | Q    |                  |     |      | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)   | 87            |      | 93             |      |                  |     |      | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)  | 3             | Q    | 1              | Q    |                  |     |      | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)   | 2             | Q    | 1              | Q    |                  |     |      | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)   | 38            | Q    | 28             | Q    |                  |     |      | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)  | 29            | Q    | 18             | Q    |                  |     |      | 50-150              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/31/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,05,09-10 Batch: WG1399517-2 WG1399517-3 |           |      |           |      |                  |     |      |            |
| Perfluorooctanesulfonamide (FOSA)   | 108       |      | 113       |      | 46-170           | 1   |      | 30         |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | 104       |      | 81        |      | 50-150           | 17  | Q    | 30         |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | 87        |      | 101       |      | 50-150           | 1   |      | 30         |
| N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)   | 112       |      | 123       |      | 50-150           | 8   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamido Ethanol (NEIFOSE)  | 90        |      | 100       |      | 50-150           | 40  | Q    | 30         |

| Surrogate (Extracted Internal Standard)                               | LCS       |      | LCSD      |      | Acceptance Criteria |
|---|-----------|------|-----------|------|---------------------|
|   | %Recovery | Qual | %Recovery | Qual |                     |
| Perfluoro[13C6]Octanesulfonamide (M8FOSA)                             | 6         |      | 6         |      | 1-87                |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                | 3         | Q    | 4         | Q    | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                 | 3         | Q    | 4         | Q    | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE) | 9         | Q    | 8         | Q    | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)  | 11        | Q    | 10        | Q    | 50-150              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/31/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 11-12 Batch: WG1399985-2 WG1399985-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanoic Acid (PFBA)   | 107       |      | 108       |      | 67-148           | 1   |      | 30         |
| Perfluoropentanoic Acid (PFPeA)   | 102       |      | 103       |      | 63-181           | 1   |      | 30         |
| Perfluorobutanesulfonic Acid (PFBS)   | 103       |      | 100       |      | 65-157           | 3   |      | 30         |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | 104       |      | 103       |      | 37-219           | 1   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 109       |      | 110       |      | 69-188           | 1   |      | 30         |
| Perfluoropentanesulfonic Acid (PFPeS)   | 95        |      | 93        |      | 52-156           | 2   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 104       |      | 106       |      | 58-159           | 2   |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | 103       |      | 105       |      | 69-177           | 2   |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 110       |      | 113       |      | 63-159           | 3   |      | 30         |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (8:2FTS)   | 113       |      | 120       |      | 49-187           | 6   |      | 30         |
| Perfluorooheptanesulfonic Acid (PFHpS)  | 102       |      | 108       |      | 61-179           | 6   |      | 30         |
| Perfluorononanoic Acid (PFNA)   | 109       |      | 111       |      | 68-171           | 2   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 101       |      | 108       |      | 52-151           | 7   |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | 104       |      | 109       |      | 63-171           | 5   |      | 30         |
| 1H,1H,2H,2H-Perfluorodecane sulfonic Acid (8:2FTS)  | 114       |      | 122       |      | 56-173           | 8   |      | 30         |
| Perfluorononanesulfonic Acid (PFNS)   | 111       |      | 124       |      | 48-150           | 11  |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | 84        |      | 102       |      | 60-166           | 19  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | 104       |      | 101       |      | 80-153           | 3   |      | 30         |
| Perfluorodecane sulfonic Acid (PFDS)  | 120       |      | 132       |      | 38-156           | 10  |      | 30         |
| Perfluorooctanesulfonamide (FOSA)   | 104       |      | 109       |      | 46-170           | 5   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | 95        |      | 99        |      | 45-170           | 4   |      | 30         |
| Perfluorododecanoic Acid (PFDoA)  | 105       |      | 112       |      | 67-153           | 6   |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/31/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 11-12 Batch: WG1399985-2 WG1399985-3 |           |      |           |      |                  |     |      |            |
| Perfluorotridecanoic Acid (PFTrDA)  | 107       |      | 117       |      | 48-158           | 9   |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | 95        |      | 99        |      | 59-182           | 1   |      | 30         |

| Surrogate (Extracted Internal Standard)                                | LCS       |      | LCSD      |      | Acceptance Criteria |
|--|-----------|------|-----------|------|---------------------|
|  | %Recovery | Qual | %Recovery | Qual |                     |
| Perfluoro[13C4]Butanoic Acid (MPFBA)                                   | 84        |      | 87        |      | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (MPFPEA)                                 | 79        |      | 80        |      | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 81        |      | 88        |      | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)         | 54        |      | 58        |      | 1-313               |
| Perfluoro[1,2,3,4,5-13C5]Hexanoic Acid (M5PFHxA)                       | 67        |      | 67        |      | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 79        |      | 79        |      | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 88        |      | 94        |      | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 80        |      | 81        |      | 36-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)         | 63        |      | 71        |      | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 74        |      | 77        |      | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 87        |      | 89        |      | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 81        |      | 88        |      | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Dacanesulfonic Acid (M2-8:2FTS)         | 69        |      | 75        |      | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 105       |      | 103       |      | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUUA)                | 99        |      | 106       |      | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                              | 44        |      | 40        |      | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEFOSAA)   | 90        |      | 93        |      | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 97        |      | 100       |      | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 85        |      | 88        |      | 33-143              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/31/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02-03,07-08 Batch: WG1401095-2 WG1401095-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanoic Acid (PFBA)   | 119       |      | 101       |      | 71-135           | 16  |      | 30         |
| Perfluoropentanoic Acid (PFPeA)   | 125       |      | 105       |      | 59-132           | 17  |      | 30         |
| Perfluorobutanesulfonic Acid (PFBS)   | 123       |      | 109       |      | 72-128           | 12  |      | 30         |
| 1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)   | 125       |      | 109       |      | 62-145           | 14  |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 124       |      | 105       |      | 70-132           | 17  |      | 30         |
| Perfluoropentanesulfonic Acid (PFPeS)   | 114       |      | 97        |      | 73-123           | 16  |      | 30         |
| Perfluorohexanoic Acid (PFHpA)  | 123       |      | 104       |      | 71-131           | 17  |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | 120       |      | 99        |      | 67-130           | 19  |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 121       |      | 107       |      | 69-133           | 12  |      | 30         |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (8:2FTS)   | 125       |      | 103       |      | 64-140           | 19  |      | 30         |
| Perfluorooptanesulfonic Acid (PFHpS)  | 124       |      | 107       |      | 70-132           | 15  |      | 30         |
| Perfluorononanoic Acid (PFNA)   | 119       |      | 105       |      | 72-129           | 13  |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 119       |      | 108       |      | 68-136           | 10  |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | 121       |      | 103       |      | 69-133           | 16  |      | 30         |
| 1H,1H,2H,2H-Perfluorodecane sulfonic Acid (8:2FTS)  | 130       |      | 109       |      | 65-137           | 16  |      | 30         |
| Perfluorononanesulfonic Acid (PFNS)   | 125       |      | 110       |      | 69-125           | 13  |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | 138       |      | 110       |      | 63-144           | 23  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | 119       |      | 100       |      | 64-136           | 17  |      | 30         |
| Perfluorodecane sulfonic Acid (PFDS)  | 128       |      | 103       |      | 59-134           | 20  |      | 30         |
| Perfluorooctanesulfonamide (FOSA)   | 129       |      | 106       |      | 67-137           | 16  |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | 115       |      | 94        |      | 61-139           | 20  |      | 30         |
| Perfluorododecanoic Acid (PFDoA)  | 128       |      | 107       |      | 69-135           | 16  |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/31/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02-03,07-08 Batch: WG1401095-2 WG1401095-3 |           |      |           |      |                  |     |      |            |
| Perfluorotridecanoic Acid (PFTrDA)  | 115       |      | 98        |      | 66-139           | 16  |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | 110       |      | 96        |      | 68-133           | 14  |      | 30         |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Hexafluoroisopropoxy]-Propanoic Acid (HFPO-DA)   | 112       |      | 94        |      | 50-150           | 17  |      | 30         |
| 4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)   | 113       |      | 100       |      | 50-150           | 12  |      | 30         |
| Perfluorohexadecanoic Acid (PFHxDA)   | 89        |      | 75        |      | 50-150           | 17  |      | 30         |
| Perfluorooctadecanoic Acid (PFODA)  | 81        |      | 64        |      | 50-150           | 23  |      | 30         |
| Perfluorododecane Sulfonic Acid (PFDS)  | 131       |      | 114       |      | 50-150           | 14  |      | 30         |
| 1H,1H,2H,2H-Perfluorododecane sulfonic Acid (10:2FTS)   | 201       | Q    | 175       | Q    | 50-150           | 14  |      | 30         |
| 9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)   | 102       |      | 93        |      | 50-150           | 9   |      | 30         |
| 11-Chlorooctadecafluoro-3-Oxandecane-1-Sulfonic Acid (11Cl-PF3ONS)  | 64        |      | 81        |      | 50-150           | 4   |      | 30         |
| N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)  | 60        |      | 122       |      | 50-150           | 42  | Q    | 30         |
| N-Ethyl Perfluorooctane Sulfonamide (NEFOSA)  | 105       |      | 148       |      | 50-150           | 34  | Q    | 30         |
| N-Methyl Perfluorooctanesulfonamide Ethanol (NMeFOSE)   | 135       |      | 163       | Q    | 50-150           | 30  |      | 30         |
| N-Ethyl Perfluorooctanesulfonamide Ethanol (NEFOSE)   | 133       |      | 166       | Q    | 50-150           | 23  |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2032501  
Report Date: 08/31/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | RPD  |        |
|---|-----------|------|-----------|------|------------------|-----|------|--------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     | Qual | Limits |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02-03,07-08 Batch: WG1401095-2 WG1401095-3 |           |      |           |      |                  |     |      |        |

| Surrogate (Extracted Internal Standard)  | LCS       |      | LCSD      |      | Acceptance Criteria |
|--|-----------|------|-----------|------|---------------------|
|  | %Recovery | Qual | %Recovery | Qual |                     |
| Perfluoro[13C4]Butanoic Acid (MPFBA)   | 66        |      | 81        |      | 60-153              |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)  | 75        |      | 91        |      | 65-192              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 74        |      | 86        |      | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)                           | 292       | Q    | 343       | Q    | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 62        |      | 74        |      | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 65        |      | 79        |      | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                                       | 76        |      | 89        |      | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFDA)  | 68        |      | 80        |      | 62-152              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)                           | 289       | Q    | 332       | Q    | 32-182              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 66        |      | 78        |      | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 73        |      | 84        |      | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)  | 66        |      | 80        |      | 65-150              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)                           | 354       | Q    | 410       | Q    | 25-186              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)                   | 109       |      | 141       | Q    | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                                  | 92        | Q    | 77        |      | 64-158              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)  | 47        |      | 56        |      | 1-125               |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEIFOSAA)                    | 132       |      | 161       | Q    | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (M2PFDOA)   | 57        |      | 66        |      | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 53        |      | 62        |      | 26-180              |
| 2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA) | 79        |      | 90        |      | 50-150              |
| Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)  | 61        |      | 75        |      | 50-150              |
| N-Methyl-d3-Perfluoro-1-Octanesulfonamide (d3-NMeFOSA)                                   | 7         | Q    | 6         | Q    | 50-150              |
| N-Ethyl-d5-Perfluoro-1-Octanesulfonamide (d5-NEIFOSA)                                    | 5         | Q    | 5         | Q    | 50-150              |
| 2-(N-Methyl-d3-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d7-NMeFOSE)                    | 12        | Q    | 13        | Q    | 50-150              |
| 2-(N-Ethyl-d5-Perfluoro-1-Octanesulfonamido)ethan-d4-ol (d9-NEIFOSE)                     | 8         | Q    | 8         | Q    | 50-150              |



Project Name: PFAS STUDY  
 Project Number: Not Specified

Serial\_No:08312016.38  
 Lab Number: L2032501  
 Report Date: 08/31/20

**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

**Cooler Information**

|               |                     |
|---------------|---------------------|
| <b>Cooler</b> | <b>Custody Seal</b> |
| A             | Absent              |
| B             | Absent              |

**Container Information**

| Container ID | Container Type  | Cooler | Initial pH | Final pH | Temp deg C | Pres | Seal   | Frozen Date/Time | Analysis(*)               |
|--------------|---|--------|------------|----------|------------|------|--------|------------------|---------------------------|
| L2032501-01A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(14);    |
| L2032501-01B | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(14);    |
| L2032501-02A | Plastic 8oz unpreserved                                 | A      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-36(28);    |
| L2032501-03A | Plastic 8oz unpreserved                                 | A      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-36(28);    |
| L2032501-04A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 3.0        | Y    | Absent |                  | A2-L-EXT-537-ISOTOPE(14); |
| L2032501-05A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(14);    |
| L2032501-05B | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | A      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(14);    |
| L2032501-06A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-L-EXT-537-ISOTOPE(14); |
| L2032501-07A | Plastic 8oz unpreserved                                 | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(28);    |
| L2032501-07B | Plastic 8oz unpreserved                                 | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(28);    |
| L2032501-08A | Plastic 8oz unpreserved                                 | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(28);    |
| L2032501-09A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(14);    |
| L2032501-10A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(14);    |
| L2032501-10B | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE-38(14);    |
| L2032501-11A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE(14);       |
| L2032501-12A | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE(14);       |
| L2032501-12B | 2 Plastic <sup>1</sup> Plastic <sup>1</sup> H2O Plastic | B      | NA         |          | 3.0        | Y    | Absent |                  | A2-537-ISOTOPE(14);       |

\*Values in parentheses indicate holding time in days



Project Name: PFAS STUDY  
 Project Number:

Serial\_No:08312016:38  
 Lab Number: L2032501  
 Report Date: 08/31/20

**PFAS PARAMETER SUMMARY**

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



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

## GLOSSARY

### Acronyms

|          |  |
|----------|--|
| DL       | - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  |
| EDL      | - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME)  |
| EMPC     | - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.   |
| EPA      | - Environmental Protection Agency.   |
| LCS      | - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.  |
| LCS-D    | - Laboratory Control Sample Duplicate: Refer to LCS.   |
| LFB      | - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.   |
| LOD      | - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)   |
| LOQ      | - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)<br><br>Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) |
| MDL      | - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.  |
| MS       | - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 3320, the spike recovery is calculated using the native concentration, including estimated values.   |
| MSD      | - Matrix Spike Sample Duplicate: Refer to MS.  |
| NA       | - Not Applicable.  |
| NC       | - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.   |
| NDPA/DPA | - N-Nitrosodiphenylamine/Diphenylamine.  |
| NI       | - Not Identifiable.  |
| NP       | - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.  |
| RI       | - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RI includes any adjustments from dilutions, concentrations or moisture content, where applicable.   |
| RPD      | - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values, although the RPD value will be provided in the report.  |
| SRM      | - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.   |
| STLP     | - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.  |
| TEF      | - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.   |
| TEQ      | - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.  |
| TIC      | - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.  |

### Footnotes

Report Format: Data Usability Report



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

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

#### Terms

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1.8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

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

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

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 18 hours from sample collection, value will be reflected in **bold**.

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

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

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (S)' result is defined as the summation of results for: PFOA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

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

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

#### Data Qualifiers

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

Report Format: Data Usability Report





**Project Name:** PFAS STUDY

**Lab Number:** L2032501

**Project Number:** Not Specified

**Report Date:** 08/31/20

**Data Qualifiers**

Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only)

- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2032501  
**Report Date:** 08/31/20

**REFERENCES**

- 134 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) using Isotope Dilution. Alpha SOP 23528.

**LIMITATION OF LIABILITIES**

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

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



### Certification Information

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

**Westborough Facility**

**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene  
**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene, SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene.  
**EPA 8270D:** NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.  
**SM1500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

**Mansfield Facility**

**SM 2540D:** TSS  
**EPA 8082A:** NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.  
**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.  
**EPA TO-12** Non-methane organics  
**EPA 3C** Fixed gases  
**Biological Tissue Matrix:** EPA 3050B

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

**Westborough Facility:**

**Drinking Water**

**EPA 300.6:** Chloride, Nitrate-N, Fluoride, Sulfate, **EPA 353.2:** Nitrate-N, Nitrite-N, **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM1500H-B, SM4500NO2-B**  
**EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.  
**Microbiology:** **SM9215B, SM9223-P/A, SM9223B-Colilert-QT,SM9222D.**

**Non-Potable Water**

**SM4500H.B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LCHAT 10-107-06-1-B.** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2.** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.  
**EPA 624.1** Volatile Halocarbons & Aromatics,  
**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs  
**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil  
**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

**Mansfield Facility:**

**Drinking Water**

**EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**  
**EPA 522.**

**Non-Potable Water**

**EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.  
**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.  
**EPA 245.1 Hg.**  
**SM1340B**

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



ANALYTICAL REPORT

|                 |  |
|-----------------|--|
| Lab Number:     | L2033550   |
| Client:         | Maryland Department of the Environment<br>1800 Washington Boulevard<br>Baltimore, MD 21230 |
| ATTN:           | Amy Laliberte  |
| Phone:          | (410) 537-3614   |
| Project Name:   | PFAS STUDY   |
| Project Number: | Not Specified  |
| Report Date:    | 09/01/20   |

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Certifications & Approvals: MA (M MA030), NH NELAP (2062), CT (PH 0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA0030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68 02089), RI (LA000299), TX (T104704419), VT (VT 0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330 17 00150), USFWS (Permit #206964).

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



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2033550  
**Report Date:** 09/01/20

| <b>Alpha<br/>Sample ID</b> | <b>Client ID</b> | <b>Matrix</b> | <b>Sample<br/>Location</b> | <b>Collection<br/>Date/Time</b> | <b>Receive Date</b> |
|----------------------------|------------------|---------------|----------------------------|---------------------------------|---------------------|
| L2033550-01                | TB-203           | WATER         | Not Specified              | 08/18/20 07:00                  | 08/18/20            |
| L2033550-02                | FB-9B            | WATER         | Not Specified              | 08/18/20 10:40                  | 08/18/20            |
| L2033550-03                | DP-01L           | TISSUE        | Not Specified              | 08/18/20 10:40                  | 08/18/20            |
| L2033550-04                | DP-01            | TISSUE        | Not Specified              | 08/18/20 10:40                  | 08/18/20            |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2033550  
**Report Date:** 09/01/20

### Case Narrative

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

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

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

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

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

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

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**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2033550  
**Report Date:** 09/01/20

**Case Narrative (continued)**

Perfluorinated Alkyl Acids by Isotope Dilution

L2033550-03: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

WG1403622-1, WG1403622-2, WG1403622-3, WG1403622-4, and WG1403622-5: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

WG1403622-2: The LCS recovery, associated with L2033550-03 and -04, is above the acceptance criteria for perfluorobutanesulfonic acid (pfbs) (140%), perfluorohexanoic acid (pfhxa) (134%), perfluoroheptanoic acid (pfhpa) (135%), perfluorooctanoic acid (pfoa) (135%), perfluorononanoic acid (pfna) (130%), perfluorodecanoic acid (pfda) (136%), n-ethyl perfluorooctanesulfonamidoacetic acid (netfosaa) (143%) and perfluorododecanoic acid (pfdoa) (138%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

WG1403622-3: The LCSD recovery, associated with L2033550-03 and -04, is above the acceptance criteria for perfluorobutanesulfonic acid (pfbs) (140%), perfluorohexanoic acid (pfhxa) (135%), perfluorohexanesulfonic acid (pfhxs) (133%), perfluorononanoic acid (pfna) (131%), perfluorooctanesulfonic acid (pfos) (139%), perfluorodecanoic acid (pfda) (134%) and perfluorododecanoic acid (pfdoa) (138%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

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

Authorized Signature:

 Alycia Mogayzel

Title: Technical Director/Representative

Date: 09/01/20

# ORGANICS





# SEMIVOLATILES



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2033550  
**Report Date:** 09/01/20

**SAMPLE RESULTS**

**Lab ID:** L2033550-03  
**Client ID:** DP-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/18/20 10:40  
**Date Received:** 08/18/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/28/20 20:50  
**Analyst:** JW  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/27/20 13:15

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/g  | 0.887 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.887 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/g  | 0.887 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/g  | 0.887 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.887 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.887 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/g  | 0.887 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.887 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/g  | 0.887 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/g  | 0.887 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/g  | 0.887 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/g  | 0.887 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/g  | 0.887 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/g  | 0.887 | --  | 1               |



Serial\_No:09012013:53

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2033550  
**Report Date:** 09/01/20

**SAMPLE RESULTS**

**Lab ID:** L2033550-03  
**Client ID:** DP-01L  
**Sample Location:** Not Specified

**Date Collected:** 08/18/20 10:40  
**Date Received:** 08/18/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 75         |           | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 119        |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 62         |           | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 65         |           | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 79         |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 67         |           | 62-152              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 70         |           | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 71         |           | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 64         | Q         | 65-150              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 78         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 64         |           | 64-158              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 87         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 59         |           | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 51         |           | 26-160              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2033550  
**Report Date:** 09/01/20

**SAMPLE RESULTS**

**Lab ID:** L2033550-04  
**Client ID:** DP-01  
**Sample Location:** Not Specified

**Date Collected:** 08/18/20 10:40  
**Date Received:** 08/18/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Tissue  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 08/28/20 21:23  
**Analyst:** JW  
**Percent Solids:** Results reported on an 'AS RECEIVED' basis.

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 08/27/20 13:15

| Parameter   | Result | Qualifier | Units | RL    | MDL | Dilution Factor |
|---|--------|-----------|-------|-------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |       |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/g  | 0.950 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/g  | 0.950 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/g  | 0.950 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/g  | 0.950 | --  | 1               |



Serial\_No:09012013:53

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2033550  
Report Date: 09/01/20

**SAMPLE RESULTS**

Lab ID: L2033550-04  
Client ID: DP-01  
Sample Location: Not Specified

Date Collected: 08/18/20 10:40  
Date Received: 08/18/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 76         |           | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 138        |           | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 64         |           | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 71         |           | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 80         |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 69         |           | 62-152              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 75         |           | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 77         |           | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 66         |           | 65-150              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 82         |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 68         |           | 64-158              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 90         |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 65         |           | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 53         |           | 26-160              |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2033550  
**Report Date:** 09/01/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 08/28/20 20:00  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 08/27/20 13:15

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 03-04 Batch: WG1403622 1</b> |        |           |       |      |     |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluorododecanoic Acid (PFDA)   | ND     |           | ng/g  | 1.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND     |           | ng/g  | 1.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/g  | 1.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)  | ND     |           | ng/g  | 1.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/g  | 1.00 | --  |



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2033550  
**Report Date:** 09/01/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134,LCMSMS-ID  
 Analytical Date: 08/28/20 20:00  
 Analyst: JW

Extraction Method: ALPHA 23528  
 Extraction Date: 08/27/20 13:15

**Parameter**                      **Result**                      **Qualifier**                      **Units**                      **RL**                      **MDL**  
 Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 03-04    Batch: WG1403622 1

| Surrogate (Extracted Internal Standard)                                | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 101       |           | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)         | 288       | Q         | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 86        |           | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 90        |           | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 108       |           | 63-166              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 95        |           | 62-152              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 97        |           | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 103       |           | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 96        |           | 65-150              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 162       | Q         | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 95        |           | 64-158              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 172       | Q         | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 87        |           | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 78        |           | 26-160              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2033550  
Report Date: 09/01/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 03-04 Batch: WG1403622-2 WG1403622-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)   | 160       | Q    | 140       | Q    | 72-128           | 0   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 134       | Q    | 135       | Q    | 70-132           | 1   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 135       | Q    | 131       | Q    | 71-131           | 3   |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | 127       |      | 133       | Q    | 67-130           | 5   |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 135       | Q    | 132       | Q    | 69-133           | 2   |      | 30         |
| Perfluorononanoic Acid (PFNA)   | 130       | Q    | 131       | Q    | 72-129           | 1   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 135       |      | 139       | Q    | 68-136           | 3   |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | 136       | Q    | 134       | Q    | 69-133           | 1   |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | 134       |      | 141       |      | 63-144           | 5   |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | 130       |      | 131       |      | 64-136           | 1   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)  | 149       | Q    | 123       |      | 61-139           | 15  |      | 30         |
| Perfluorododecanoic Acid (PFDoA)  | 138       | Q    | 138       | Q    | 69-135           | 0   |      | 30         |
| Perfluorotridecanoic Acid (PFTDA)   | 132       |      | 132       |      | 66-139           | 0   |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | 128       |      | 128       |      | 69-133           | 0   |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS STUDY  
Project Number: Not Specified

Lab Number: L2033550  
Report Date: 09/01/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits    | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|---------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                     |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 03-04 Batch: WG1403622-2 WG1403622-3 |           |      |           |      |                     |     |      |            |
| Surrogate (Extracted Internal Standard)   | LCS       |      | LCSD      |      | Acceptance Criteria |     |      |            |
|   | %Recovery | Qual | %Recovery | Qual |                     |     |      |            |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)   | 97        |      | 102       |      | 70-151              |     |      |            |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)  | 261       | Q    | 308       | Q    | 56-138              |     |      |            |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)  | 85        |      | 85        |      | 61-147              |     |      |            |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHxA)   | 88        |      | 90        |      | 62-149              |     |      |            |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)  | 101       |      | 103       |      | 63-166              |     |      |            |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)   | 92        |      | 95        |      | 62-152              |     |      |            |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)   | 96        |      | 97        |      | 61-154              |     |      |            |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)   | 95        |      | 96        |      | 65-151              |     |      |            |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)   | 89        |      | 92        |      | 65-150              |     |      |            |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)  | 129       |      | 131       |      | 45-137              |     |      |            |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)   | 86        |      | 87        |      | 64-158              |     |      |            |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 134       |      | 156       | Q    | 42-136              |     |      |            |
| Perfluoro[1,2-13C2]Dodecanoic Acid (M2PFDOA)  | 80        |      | 78        |      | 56-148              |     |      |            |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)  | 74        |      | 72        |      | 26-160              |     |      |            |





**Matrix Spike Analysis**  
Batch Quality Control

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2033550  
**Report Date:** 09/01/20

| Parameter  | Native Sample | MS Added | MS Found | MS %Recovery | Qual | MSD Found | MSD %Recovery | Qual | Recovery Limits | RPD | Qual | RPD Limits |
|--|---------------|----------|----------|--------------|------|-----------|---------------|------|-----------------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 03-04 QC Batch ID: WG1403622-4 QC Sample: L2033550-03 Client ID: DP-01L |               |          |          |              |      |           |               |      |                 |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)  | ND            | 4.14     | 4.58     | 111          |      | -         | -             |      | 72-128          | -   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)   | ND            | 4.66     | 5.05     | 106          |      | -         | -             |      | 70-132          | -   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)   | ND            | 4.66     | 4.90     | 105          |      | -         | -             |      | 71-131          | -   |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)   | ND            | 4.26     | 4.41     | 103          |      | -         | -             |      | 67-130          | -   |      | 30         |
| Perfluorooctanoic Acid (PFOA)  | ND            | 4.66     | 4.98     | 107          |      | -         | -             |      | 69-133          | -   |      | 30         |
| Perfluorononanoic Acid (PFNA)  | ND            | 4.66     | 5.08     | 109          |      | -         | -             |      | 72-129          | -   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)  | ND            | 4.33     | 4.64F    | 107          |      | -         | -             |      | 68-136          | -   |      | 30         |
| Perfluorodecanoic Acid (PFDA)  | ND            | 4.66     | 4.87     | 104          |      | -         | -             |      | 69-133          | -   |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)  | ND            | 4.66     | 4.58     | 99           |      | -         | -             |      | 63-144          | -   |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)   | ND            | 4.66     | 4.88     | 105          |      | -         | -             |      | 64-136          | -   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)  | ND            | 4.66     | 4.61     | 99           |      | -         | -             |      | 61-139          | -   |      | 30         |
| Perfluorododecanoic Acid (PFDoA)   | ND            | 4.66     | 5.05     | 108          |      | -         | -             |      | 69-135          | -   |      | 30         |
| Perfluorotridecanoic Acid (PFTiDA)   | ND            | 4.66     | 4.93     | 106          |      | -         | -             |      | 66-139          | -   |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)   | ND            | 4.66     | 4.72     | 101          |      | -         | -             |      | 69-133          | -   |      | 30         |

| Surrogate (Extracted Internal Standard)                                | MS         |           | MSD        |           | Acceptance Criteria |
|--|------------|-----------|------------|-----------|---------------------|
|  | % Recovery | Qualifier | % Recovery | Qualifier |                     |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 114        |           |            |           | 56-138              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5 NEIFOSAA)  | 95         |           |            |           | 42-136              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 84         |           |            |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 64         |           |            |           | 64-158              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 64         | Q         |            |           | 65-150              |



**Matrix Spike Analysis**  
Batch Quality Control

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2033550  
**Report Date:** 09/01/20

| Parameter  | Native Sample | MS Added  | MS Found   | MS %Recovery | Qual                | MSD Found | MSD %Recovery | Qual | Recovery Limits | RPD | Qual | RPD Limits |   |    |  |     |  |                     |            |           |            |           |  |    |   |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
|--|---------------|-----------|------------|--------------|---------------------|-----------|---------------|------|-----------------|-----|------|------------|---|----|--|-----|--|---------------------|------------|-----------|------------|-----------|--|----|---|--|--|--------|---|----|--|--|--|--------|--|----|--|--|--|--------|---|----|--|--|--|--------|--|----|--|--|--|--------|---|----|--|--|--|--------|---------------------------------------|----|--|--|--|--------|---------------------------------------|----|--|--|--|--------|---|----|--|--|--|--------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 03-04 QC Batch ID: WG1403622-4 QC Sample: L2033550-03 Client ID: DP-01L   |               |           |            |              |                     |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |   |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| <table border="1"> <thead> <tr> <th rowspan="2">Surrogate (Extracted Internal Standard)</th> <th colspan="2">MS</th> <th colspan="2">MSD</th> <th rowspan="2">Acceptance Criteria</th> </tr> <tr> <th>% Recovery</th> <th>Qualifier</th> <th>% Recovery</th> <th>Qualifier</th> </tr> </thead> <tbody> <tr> <td>Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)</td> <td>58</td> <td>Q</td> <td></td> <td></td> <td>61-147</td> </tr> <tr> <td>Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)</td> <td>65</td> <td></td> <td></td> <td></td> <td>62-149</td> </tr> <tr> <td>Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)</td> <td>77</td> <td></td> <td></td> <td></td> <td>63-166</td> </tr> <tr> <td>Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)</td> <td>61</td> <td></td> <td></td> <td></td> <td>56-148</td> </tr> <tr> <td>Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)</td> <td>51</td> <td></td> <td></td> <td></td> <td>26-160</td> </tr> <tr> <td>Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)</td> <td>73</td> <td></td> <td></td> <td></td> <td>65-151</td> </tr> <tr> <td>Perfluoro[13C8]Octanoic Acid (M8PFOA)</td> <td>65</td> <td></td> <td></td> <td></td> <td>62-152</td> </tr> <tr> <td>Perfluoro[13C9]Nonanoic Acid (M9PFNA)</td> <td>66</td> <td></td> <td></td> <td></td> <td>61-154</td> </tr> <tr> <td>Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)</td> <td>74</td> <td></td> <td></td> <td></td> <td>70-151</td> </tr> </tbody> </table> |               |           |            |              |                     |           |               |      |                 |     |      |            | Surrogate (Extracted Internal Standard) | MS |  | MSD |  | Acceptance Criteria | % Recovery | Qualifier | % Recovery | Qualifier | Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA) | 58 | Q |  |  | 61-147 | Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA) | 65 |  |  |  | 62-149 | Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS) | 77 |  |  |  | 63-166 | Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA) | 61 |  |  |  | 56-148 | Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA) | 51 |  |  |  | 26-160 | Perfluoro[13C8]Octanesulfonic Acid (M8PFOS) | 73 |  |  |  | 65-151 | Perfluoro[13C8]Octanoic Acid (M8PFOA) | 65 |  |  |  | 62-152 | Perfluoro[13C9]Nonanoic Acid (M9PFNA) | 66 |  |  |  | 61-154 | Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS) | 74 |  |  |  | 70-151 |
| Surrogate (Extracted Internal Standard)  | MS            |           | MSD        |              | Acceptance Criteria |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |   |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
|  | % Recovery    | Qualifier | % Recovery | Qualifier    |                     |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |   |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)   | 58            | Q         |            |              | 61-147              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |   |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)  | 65            |           |            |              | 62-149              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |   |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)   | 77            |           |            |              | 63-166              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |   |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)  | 61            |           |            |              | 56-148              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |   |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)   | 51            |           |            |              | 26-160              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |   |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)  | 73            |           |            |              | 65-151              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |   |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)  | 65            |           |            |              | 62-152              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |   |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)  | 66            |           |            |              | 61-154              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |   |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)  | 74            |           |            |              | 70-151              |           |               |      |                 |     |      |            |   |    |  |     |  |                     |            |           |            |           |  |    |   |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |  |    |  |  |  |        |   |    |  |  |  |        |                                       |    |  |  |  |        |                                       |    |  |  |  |        |   |    |  |  |  |        |



Project Name: PFAS STUDY  
Project Number: Not Specified

**Lab Duplicate Analysis**  
Batch Quality Control

Lab Number: L2033550  
Report Date: 09/01/20

| Parameter   | Native Sample | Duplicate Sample | Units | RPD | Qual | RPD Limits |
|---|---------------|------------------|-------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 03-04 QC Batch ID: WG1403622-5 QC Sample: L2033550-04 Client ID: DP-01 |               |                  |       |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluoroheptanoic Acid (PFHpA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorononanoic Acid (PFNA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorododecanoic Acid (PFDoA)  | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorotridecanoic Acid (PFTTrDA)   | ND            | ND               | ng/g  | NC  |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | ND            | ND               | ng/g  | NC  |      | 30         |

| Surrogate (Extracted Internal Standard)                        | %Recovery | Qualifier | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|-----------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)              | 76        |           | 76        |           | 70-151              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS) | 138       |           | 154       | Q         | 56-138              |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)               | 64        |           | 65        |           | 61-147              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                | 71        |           | 73        |           | 62-149              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)             | 80        |           | 81        |           | 63-166              |

Page 17 of 30



Serial\_No:09012013:53

Project Name: PFAS STUDY  
Project Number: Not Specified

**Lab Duplicate Analysis**  
Batch Quality Control

Lab Number: L2033550  
Report Date: 09/01/20

| Parameter   | Native Sample | Duplicate Sample | Units | RPD | Qual | RPD Limits |
|---|---------------|------------------|-------|-----|------|------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 03-04 QC Batch ID: WG1403622-5 QC Sample: L2033550-04 Client ID: DP-01 |               |                  |       |     |      |            |

| Surrogate (Extracted Internal Standard)                                | %Recovery | Qualifier | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|-----------|-----------|---------------------|
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 69        |           | 73        |           | 62-152              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 75        |           | 79        |           | 61-154              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 77        |           | 80        |           | 65-151              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 66        |           | 70        |           | 65-150              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 82        |           | 102       |           | 45-137              |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUUA)                | 68        |           | 70        |           | 64-158              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEFOSAA)   | 90        |           | 106       |           | 42-136              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 65        |           | 66        |           | 56-148              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 53        |           | 55        |           | 26-160              |

Page 18 of 30



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Serial\_No:**09012013.53  
**Lab Number:** L2033550  
**Report Date:** 09/01/20

**Sample Receipt and Container Information**

Were project specific reporting limits specified? YES

**Cooler Information**

**Cooler**                      **Custody Seal**  
A                                      Absent

**Container Information**

| <b>Container ID</b> | <b>Container Type</b>     | <b>Cooler</b> | <b>Initial pH</b> | <b>Final pH</b> | <b>Temp deg C</b> | <b>Pres</b> | <b>Seal</b> | <b>Frozen Date/Time</b> | <b>Analysis(*)</b> |
|---------------------|---------------------------|---------------|-------------------|-----------------|-------------------|-------------|-------------|-------------------------|--------------------|
| L2033550-01A        | Plastic 250ml unpreserved | A             | NA                |                 | 3.8               | Y           | Absent      |                         | HOLD-537(14)       |
| L2033550-02A        | Plastic 250ml unpreserved | A             | NA                |                 | 3.8               | Y           | Absent      |                         | HOLD-537(14)       |
| L2033550-03A        | Plastic 8oz unpreserved   | A             | NA                |                 | 3.8               | Y           | Absent      |                         | A2-537-ISOTOPE(28) |
| L2033550-04A        | Plastic 8oz unpreserved   | A             | NA                |                 | 3.8               | Y           | Absent      |                         | A2-537-ISOTOPE(28) |

\*Values in parentheses indicate holding time in days



Project Name: PFAS STUDY  
 Project Number:

Serial\_No:09012013:53  
 Lab Number: L2033550  
 Report Date: 09/01/20

**PFAS PARAMETER SUMMARY**

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



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2033550  
**Report Date:** 09/01/20

## GLOSSARY

### Acronyms

|          |  |
|----------|--|
| DL       | - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  |
| EDL      | - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME)  |
| EMPC     | - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.   |
| EPA      | - Environmental Protection Agency.   |
| LCS      | - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.  |
| LCSd     | - Laboratory Control Sample Duplicate: Refer to LCS.   |
| LFB      | - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.   |
| LOD      | - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)   |
| LOQ      | - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)<br><br>Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) |
| MDL      | - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.  |
| MS       | - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 3320, the spike recovery is calculated using the native concentration, including estimated values.   |
| MSD      | - Matrix Spike Sample Duplicate: Refer to MS.  |
| NA       | - Not Applicable.  |
| NC       | - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.   |
| NDPA/DPA | - N-Nitrosodiphenylamine/Diphenylamine.  |
| NI       | - Not Identifiable.  |
| NP       | - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.  |
| RI       | - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RI includes any adjustments from dilutions, concentrations or moisture content, where applicable.   |
| RPD      | - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values, although the RPD value will be provided in the report.  |
| SRM      | - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.   |
| STLP     | - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.  |
| TEF      | - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.   |
| TEQ      | - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.  |
| TIC      | - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.  |

### Footnotes

Report Format: Data Usability Report



**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2033550  
**Report Date:** 09/01/20

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

#### Terms

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1.8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

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

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

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 18 hours from sample collection, value will be reflected in **bold**.

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

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

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (S)' result is defined as the summation of results for: PFOA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

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

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

#### Data Qualifiers

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

Report Format: Data Usability Report



**Project Name:** PFAS STUDY

**Lab Number:** L2033550

**Project Number:** Not Specified

**Report Date:** 09/01/20

**Data Qualifiers**

Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only)

**R** - Analytical results are from sample re-analysis.

**RE** - Analytical results are from sample re-extraction.

**S** - Analytical results are from modified screening analysis.

**Project Name:** PFAS STUDY  
**Project Number:** Not Specified

**Lab Number:** L2033550  
**Report Date:** 09/01/20

#### REFERENCES

- 134 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) using Isotope Dilution. Alpha SOP 23528.

#### LIMITATION OF LIABILITIES

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

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





### Certification Information

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

**Westborough Facility**

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene  
 EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene, SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene.  
 EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.  
 SM1500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

**Mansfield Facility**

SM 2540D: TSS  
 EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.  
 EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.  
 EPA TO-12 Non-methane organics  
 EPA 3C Fixed gases  
 Biological Tissue Matrix: EPA 3050B

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

**Westborough Facility:**

**Drinking Water**

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate, EPA 353.2: Nitrate-N, Nitrite-N, SM4500NO3-F: Nitrate-N, Nitrite-N; SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM1500H-B, SM4500NO2-B  
 EPA 332: Perchlorate; EPA 524.2: THMs and VOCs; EPA 504.1: EDB, DBCP.  
 Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D.

**Non-Potable Water**

SM4500H.B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, EPA 350.1: Ammonia-N, LCHAT 10-107-06-1-B, Ammonia-N, EPA 351.1, SM4500NO3-F, EPA 353.2: Nitrate-N, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.  
 EPA 624.1 Volatile Halocarbons & Aromatics,  
 EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs  
 EPA 625.1: SVOC (Acid/Base/Neutral Extractables), EPA 600/4-81-045: PCB-Oil  
 Microbiology: SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.

**Mansfield Facility:**

**Drinking Water**

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. EPA 200.8: Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. EPA 245.1 Hg.  
 EPA 522.

**Non-Potable Water**

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.  
 EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.  
 EPA 245.1 Hg.  
 SM2340B

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



ANALYTICAL REPORT

|                 |  |
|-----------------|--|
| Lab Number:     | L2023415   |
| Client:         | Maryland Department of the Environment<br>1800 Washington Boulevard<br>Baltimore, MD 21230 |
| ATTN:           | Amy Laliberte  |
| Phone:          | (410) 537-3614   |
| Project Name:   | PFAS PILOT STUDY   |
| Project Number: | 322652   |
| Report Date:    | 06/19/20   |

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Certifications & Approvals: MA (M MA030), NH NELAP (2062), CT (PH 0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA0030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68 02089), RI (LA000299), TX (T104704419), VT (VT 0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330 17 00150), USFWS (Permit #206964).

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



**Project Name:** PFAS PILOT STUDY  
**Project Number:** 322652

**Lab Number:** L2023415  
**Report Date:** 06/19/20

| <b>Alpha<br/>Sample ID</b> | <b>Client ID</b> | <b>Matrix</b> | <b>Sample<br/>Location</b> | <b>Collection<br/>Date/Time</b> | <b>Receive Date</b> |
|----------------------------|------------------|---------------|----------------------------|---------------------------------|---------------------|
| L2023415-01                | T4               | WATER         | ST. MARY'S RIVER           | 06/04/20 09:02                  | 06/05/20            |
| L2023415-02                | T-5              | WATER         | ST. MARY'S RIVER           | 06/04/20 09:10                  | 06/05/20            |
| L2023415-03                | T3               | WATER         | ST. MARY'S RIVER           | 06/04/20 09:00                  | 06/05/20            |
| L2023415-04                | FISHING BAY      | WATER         | ST. MARY'S RIVER           | 06/04/20 10:10                  | 06/05/20            |



**Project Name:** PFAS PILOT STUDY  
**Project Number:** 322652

**Lab Number:** L2023415  
**Report Date:** 06/19/20

### Case Narrative

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

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

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

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

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

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

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**Project Name:** PFAS PILOT STUDY  
**Project Number:** 322652

**Lab Number:** L2023415  
**Report Date:** 06/19/20

**Case Narrative (continued)**

Sample Receipt

L2023415-03: The collection date and time on the chain of custody and container label was 4-JUN-20 10:10; however, at the client's request, the collection date/time is reported as 04-JUN-20 09:00.

L2023415-03: The sample identified as "T3" on the chain of custody was not identified on the container label. At the client's request, the sample is reported as "T3".

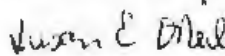
L2023415-04: The sample identified as "Field Blank" on the chain of custody and container label is reported as "FISHING BAY" per client request.

Perfluorinated Alkyl Acids by Isotope Dilution

The WG1380295-2 LCS recovery, associated with L2023415-01 through -04, is above the acceptance criteria for n-ethyl perfluorooctanesulfonamidoacetic acid (netfosaa) (177%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

The WG1380295-2/-3 LCS/LCSD RPD, associated with L2023415-01 through -04, is above the acceptance criteria for n-ethyl perfluorooctanesulfonamidoacetic acid (netfosaa) (31%).

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

Authorized Signature:  Susan O'Neil

Title: Technical Director/Representative

Date: 06/19/20

# ORGANICS



# SEMIVOLATILES



**Project Name:** PFAS PILOT STUDY  
**Project Number:** 322652

**Lab Number:** L2023415  
**Report Date:** 06/19/20

**SAMPLE RESULTS**

**Lab ID:** L2023415-01  
**Client ID:** T4  
**Sample Location:** ST. MARY'S RIVER

**Date Collected:** 06/04/20 09:02  
**Date Received:** 06/05/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 06/17/20 10:29  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 06/11/20 06:43

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.79 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.79 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.79 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.79 | --  | 1               |





Serial\_No:06192015:40

Project Name: PFAS PILOT STUDY  
Project Number: 322652

Lab Number: L2023415  
Report Date: 06/19/20

**SAMPLE RESULTS**

Lab ID: L2023415-01  
Client ID: T4  
Sample Location: ST. MARY'S RIVER

Date Collected: 06/04/20 09:02  
Date Received: 06/05/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 114        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 117        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 102        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 97         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 111        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 105        |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 109        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 112        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 88         |           | 58-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 92         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 99         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 89         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 95         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 65         |           | 33-143              |



Serial\_No:06192015:40

Project Name: PFAS PILOT STUDY  
Project Number: 322652

Lab Number: L2023415  
Report Date: 06/19/20

**SAMPLE RESULTS**

Lab ID: L2023415-02  
Client ID: T-5  
Sample Location: ST. MARY'S RIVER

Date Collected: 06/04/20 09:10  
Date Received: 06/05/20  
Field Prep: Not Specified

Sample Depth:  
Matrix: Water  
Analytical Method: 134,LCMSMS-ID  
Analytical Date: 06/17/20 10:46  
Analyst: SG

Extraction Method: ALPHA 23528  
Extraction Date: 06/11/20 06:43

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.81 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.81 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.81 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.81 | --  | 1               |



Serial\_No:06192015:40

Project Name: PFAS PILOT STUDY  
Project Number: 322652

Lab Number: L2023415  
Report Date: 06/19/20

**SAMPLE RESULTS**

Lab ID: L2023415-02  
Client ID: T-5  
Sample Location: ST. MARY'S RIVER

Date Collected: 06/04/20 09:10  
Date Received: 06/05/20  
Field Prep: Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 108        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 115        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 95         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 92         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 107        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 94         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 105        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 110        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 87         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 92         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 93         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 72         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 100        |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 63         |           | 33-143              |



**Project Name:** PFAS PILOT STUDY  
**Project Number:** 322652

**Lab Number:** L2023415  
**Report Date:** 06/19/20

**SAMPLE RESULTS**

**Lab ID:** L2023415-03  
**Client ID:** T3  
**Sample Location:** ST. MARY'S RIVER

**Date Collected:** 06/04/20 09:00  
**Date Received:** 06/05/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 06/17/20 11:02  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 06/11/20 06:43

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.98 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.98 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.98 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.98 | --  | 1               |



Serial\_No:06192015:40

**Project Name:** PFAS PILOT STUDY  
**Project Number:** 322652

**Lab Number:** L2023415  
**Report Date:** 06/19/20

**SAMPLE RESULTS**

**Lab ID:** L2023415-03  
**Client ID:** T3  
**Sample Location:** ST. MARY'S RIVER

**Date Collected:** 06/04/20 09:00  
**Date Received:** 06/05/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 104        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 112        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 97         |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 90         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 104        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 97         |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 100        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 104        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 88         |           | 38-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 89         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 96         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 78         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 94         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 62         |           | 33-143              |



**Project Name:** PFAS PILOT STUDY  
**Project Number:** 322652

**Lab Number:** L2023415  
**Report Date:** 06/19/20

**SAMPLE RESULTS**

**Lab ID:** L2023415-04  
**Client ID:** FISHING BAY  
**Sample Location:** ST. MARY'S RIVER

**Date Collected:** 06/04/20 10:10  
**Date Received:** 06/05/20  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Water  
**Analytical Method:** 134,LCMSMS-ID  
**Analytical Date:** 06/17/20 11:19  
**Analyst:** SG

**Extraction Method:** ALPHA 23528  
**Extraction Date:** 06/11/20 06:43

| Parameter   | Result | Qualifier | Units | RL   | MDL | Dilution Factor |
|---|--------|-----------|-------|------|-----|-----------------|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab</b> |        |           |       |      |     |                 |
| Perfluorobutanesulfonic Acid (PFBS)                                   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluoroheptanoic Acid (PFHpA)                                       | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorohexanesulfonic Acid (PFHxS)                                  | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorooctanesulfonic Acid (PFOS)                                   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorodecanoic Acid (PFDA)   | ND     |           | ng/l  | 1.88 | --  | 1               |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)             | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluoroundecanoic Acid (PFUnA)                                      | ND     |           | ng/l  | 1.88 | --  | 1               |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)               | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorododecanoic Acid (PFDoA)                                      | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorotridecanoic Acid (PFTriDA)                                   | ND     |           | ng/l  | 1.88 | --  | 1               |
| Perfluorotetradecanoic Acid (PFTA)                                    | ND     |           | ng/l  | 1.88 | --  | 1               |



Serial\_No:06192015:40

**Project Name:** PFAS PILOT STUDY  
**Project Number:** 322652

**Lab Number:** L2023415  
**Report Date:** 06/19/20

**SAMPLE RESULTS**

**Lab ID:** L2023415-04  
**Client ID:** FISHING BAY  
**Sample Location:** ST. MARY'S RIVER

**Date Collected:** 06/04/20 10:10  
**Date Received:** 06/05/20  
**Field Prep:** Not Specified

Sample Depth:

| Parameter  | Result | Qualifier | Units | RL | MDL | Dilution Factor |
|--|--------|-----------|-------|----|-----|-----------------|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab |        |           |       |    |     |                 |

| Surrogate (Extracted Internal Standard)                                | % Recovery | Qualifier | Acceptance Criteria |
|--|------------|-----------|---------------------|
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 112        |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4-2FTS)         | 117        |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 103        |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 97         |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 112        |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 105        |           | 36-149              |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 112        |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 108        |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 86         |           | 58-144              |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 92         |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 93         |           | 40-144              |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 87         |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 89         |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 59         |           | 33-143              |



**Project Name:** PFAS PILOT STUDY  
**Project Number:** 322652

**Lab Number:** L2023415  
**Report Date:** 06/19/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 06/17/20 07:43  
 Analyst: SG

Extraction Method: ALPHA 23528  
 Extraction Date: 06/11/20 06:43

| Parameter   | Result | Qualifier | Units | RL   | MDL |
|---|--------|-----------|-------|------|-----|
| <b>Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-04 Batch: WG1380295 1</b> |        |           |       |      |     |
| Perfluorobutanesulfonic Acid (PFBS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanoic Acid (PFHxA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroheptanoic Acid (PFHpA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorohexanesulfonic Acid (PFHxS)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanoic Acid (PFOA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorononanoic Acid (PFNA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorooctanesulfonic Acid (PFOS)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDA)   | ND     |           | ng/l  | 2.00 | --  |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | ND     |           | ng/l  | 2.00 | --  |
| Perfluoroundecanoic Acid (PFUnA)  | ND     |           | ng/l  | 2.00 | --  |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorododecanoic Acid (PFDoA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotridecanoic Acid (PFTrDA)  | ND     |           | ng/l  | 2.00 | --  |
| Perfluorotetradecanoic Acid (PFTA)  | ND     |           | ng/l  | 2.00 | --  |





**Project Name:** PFAS PILOT STUDY  
**Project Number:** 322652

**Lab Number:** L2023415  
**Report Date:** 06/19/20

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 134.LCMSMS-ID  
 Analytical Date: 06/17/20 07:43  
 Analyst: SG

Extraction Method: ALPHA 23528  
 Extraction Date: 06/11/20 06:43

| Parameter  | Result | Qualifier | Units | RL | MDL |
|--|--------|-----------|-------|----|-----|
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-04 Batch: WG1380295-1 |        |           |       |    |     |

| Surrogate (Extracted Internal Standard)                                | %Recovery | Qualifier | Acceptance Criteria |
|--|-----------|-----------|---------------------|
| Perfluoro[13C4]Butanoic Acid (MPFBA)                                   | 114       |           | 2-156               |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)                                | 142       |           | 16-173              |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)                      | 115       |           | 31-159              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)         | 118       |           | 1-313               |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)                       | 108       |           | 21-145              |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)                        | 104       |           | 30-139              |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)                     | 124       |           | 47-153              |
| Perfluoro[13C8]Octanoic Acid (M8PFOA)                                  | 113       |           | 38-149              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)         | 113       |           | 1-244               |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)                                  | 128       |           | 34-146              |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)                            | 115       |           | 42-146              |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)                      | 106       |           | 38-144              |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)         | 124       |           | 7-170               |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 101       |           | 1-181               |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)                | 104       |           | 40-144              |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)                              | 30        |           | 1-87                |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)  | 96        |           | 23-146              |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)                            | 107       |           | 24-161              |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)                       | 84        |           | 33-143              |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS PILOT STUDY  
Project Number: 322652

Lab Number: L2023415  
Report Date: 06/19/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                  |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04 Batch: WG1380295-2 WG1380295-3 |           |      |           |      |                  |     |      |            |
| Perfluorobutanesulfonic Acid (PFBS)   | 117       |      | 119       |      | 65-157           | 2   |      | 30         |
| Perfluorohexanoic Acid (PFHxA)  | 130       |      | 124       |      | 59-188           | 5   |      | 30         |
| Perfluorooheptanoic Acid (PFHpA)  | 127       |      | 131       |      | 58-159           | 3   |      | 30         |
| Perfluorohexanesulfonic Acid (PFHxS)  | 128       |      | 124       |      | 59-177           | 3   |      | 30         |
| Perfluorooctanoic Acid (PFOA)   | 121       |      | 120       |      | 63-159           | 1   |      | 30         |
| Perfluorononanoic Acid (PFNA)   | 120       |      | 126       |      | 68-171           | 5   |      | 30         |
| Perfluorooctanesulfonic Acid (PFOS)   | 123       |      | 128       |      | 52-151           | 4   |      | 30         |
| Perfluorodecanoic Acid (PFDA)   | 126       |      | 126       |      | 63-171           | 0   |      | 30         |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)   | 130       |      | 135       |      | 80-186           | 4   |      | 30         |
| Perfluoroundecanoic Acid (PFUnA)  | 132       |      | 127       |      | 60-153           | 4   |      | 30         |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)  | 177       | Q    | 129       |      | 45-170           | 21  | Q    | 30         |
| Perfluorododecanoic Acid (PFDDA)  | 138       |      | 120       |      | 67-153           | 7   |      | 30         |
| Perfluorotridecanoic Acid (PFTDA)   | 135       |      | 126       |      | 48-158           | 7   |      | 30         |
| Perfluorotetradecanoic Acid (PFTA)  | 130       |      | 127       |      | 59-182           | 2   |      | 30         |



**Lab Control Sample Analysis**  
Batch Quality Control

Project Name: PFAS PILOT STUDY  
Project Number: 322652

Lab Number: L2023415  
Report Date: 06/19/20

| Parameter   | LCS       |      | LCSD      |      | %Recovery Limits    | RPD | Qual | RPD Limits |
|---|-----------|------|-----------|------|---------------------|-----|------|------------|
|   | %Recovery | Qual | %Recovery | Qual |                     |     |      |            |
| Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04 Batch: WG1380295-2 WG1380295-3 |           |      |           |      |                     |     |      |            |
| Surrogate (Extracted Internal Standard)   | LCS       |      | LCSD      |      | Acceptance Criteria |     |      |            |
|   | %Recovery | Qual | %Recovery | Qual |                     |     |      |            |
| Perfluoro[13C4]Butanoic Acid (MPFBA)  | 108       |      | 107       |      | 2-156               |     |      |            |
| Perfluoro[13C5]Pentanoic Acid (M5PFPEA)   | 134       |      | 131       |      | 16-173              |     |      |            |
| Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)   | 116       |      | 106       |      | 31-159              |     |      |            |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)  | 129       |      | 112       |      | 1-313               |     |      |            |
| Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)  | 99        |      | 104       |      | 21-145              |     |      |            |
| Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)   | 102       |      | 99        |      | 30-139              |     |      |            |
| Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)  | 112       |      | 105       |      | 47-153              |     |      |            |
| Perfluoro[13C8]Octanoic Acid (M8PFDA)   | 105       |      | 108       |      | 36-149              |     |      |            |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)  | 163       |      | 120       |      | 1-244               |     |      |            |
| Perfluoro[13C9]Nonanoic Acid (M9PFNA)   | 114       |      | 104       |      | 34-146              |     |      |            |
| Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)   | 129       |      | 105       |      | 42-146              |     |      |            |
| Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)   | 89        |      | 91        |      | 38-144              |     |      |            |
| 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)  | 139       |      | 115       |      | 7-170               |     |      |            |
| N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)  | 104       |      | 100       |      | 1-181               |     |      |            |
| Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)   | 95        |      | 96        |      | 40-144              |     |      |            |
| Perfluoro[13C8]Octanesulfonamide (M8FOSA)   | 35        |      | 36        |      | 1-87                |     |      |            |
| N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)   | 67        |      | 30        |      | 23-146              |     |      |            |
| Perfluoro[1,2-13C2]Dodecanoic Acid (MPDDA)  | 98        |      | 105       |      | 24-181              |     |      |            |
| Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)  | 76        |      | 78        |      | 33-143              |     |      |            |



**Project Name:** PFAS PILOT STUDY  
**Project Number:** 322652

**Serial\_No:**06192015:40  
**Lab Number:** L2023415  
**Report Date:** 06/19/20

**Sample Receipt and Container Information**

Were project specific reporting limits specified? YES

**Cooler Information**

| Cooler | Custody Seal |
|--------|--------------|
| A      | Absent       |
| B      | Absent       |
| C      | Absent       |
| D      | Absent       |

**Container Information**

| Container ID | Container Type                      | Cooler | Initial pH | Final pH | Temp deg C | Pres | Seal   | Frozen Date/Time | Analysis(*)        |
|--------------|-------------------------------------|--------|------------|----------|------------|------|--------|------------------|--------------------|
| L2023415-01A | 2 Plastic(1) Plastic(1) H2O Plastic | A      | NA         |          | 3.2        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2023415-02A | 2 Plastic(1) Plastic(1) H2O Plastic | B      | NA         |          | 3.6        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2023415-03A | 2 Plastic(1) Plastic(1) H2O Plastic | C      | NA         |          | 3.1        | Y    | Absent |                  | A2-537-ISOTOPE(14) |
| L2023415-04A | 2 Plastic(1) Plastic(1) H2O Plastic | D      | NA         |          | 5.2        | Y    | Absent |                  | A2-537-ISOTOPE(14) |

\*Values in parentheses indicate holding time in days



Project Name: PFAS PILOT STUDY  
 Project Number: 322652

Serial\_No:06192015:40  
 Lab Number: L2023415  
 Report Date: 06/19/20

**PFAS PARAMETER SUMMARY**

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



**Project Name:** PFAS PILOT STUDY  
**Project Number:** 322652

**Lab Number:** L2023415  
**Report Date:** 06/19/20

## GLOSSARY

### Acronyms

|          |  |
|----------|--|
| DL       | - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  |
| EDL      | - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME)  |
| EMPC     | - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.   |
| EPA      | - Environmental Protection Agency.   |
| LCS      | - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes of a material containing known and verified amounts of analytes.  |
| LCS-D    | - Laboratory Control Sample Duplicate: Refer to LCS.   |
| LFB      | - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes of a material containing known and verified amounts of analytes.   |
| LOD      | - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)   |
| LOQ      | - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)<br><br>Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) |
| MDL      | - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.  |
| MS       | - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 3320, the spike recovery is calculated using the native concentration, including estimated values.   |
| MSD      | - Matrix Spike Sample Duplicate: Refer to MS.  |
| NA       | - Not Applicable.  |
| NC       | - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.   |
| NDPA/DPA | - N-Nitrosodiphenylamine/Diphenylamine.  |
| NI       | - Not Identifiable.  |
| NP       | - Non-Plastic: Term is utilized for the analysis of Attorbeg Limits in soil.   |
| RI       | - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RI includes any adjustments from dilutions, concentrations or moisture content, where applicable.   |
| RPD      | - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values, although the RPD value will be provided in the report.  |
| SRM      | - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.   |
| STLP     | - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.  |
| TEF      | - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.   |
| TEQ      | - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.  |
| TIC      | - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.  |

### Footnotes

Report Format: Data Usability Report



**Project Name:** PFAS PILOT STUDY  
**Project Number:** 322652

**Lab Number:** L2023415  
**Report Date:** 06/19/20

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

#### Terms

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1.8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

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

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

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 18 hours from sample collection, value will be reflected in **bold**.

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

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

**PFAS Total:** With respect to PFAS analyses, the 'PFAS Total (SF)' result is defined as the summation of results for: PFOA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

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

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

#### Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compounds). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TIC's).
- M** - Reporting Limit (RL) exceeds the MCP/CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TIC's), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedances are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less

Report Format: Data Usability Report



**Project Name:** PFAS PILOT STUDY

**Lab Number:** L2023415

**Project Number:** 322652

**Report Date:** 06/19/20

**Data Qualifiers**

- than 5x the RL (Metals only )
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.



**Project Name:** PFAS PILOT STUDY  
**Project Number:** 322652

**Lab Number:** L2023415  
**Report Date:** 06/19/20

**REFERENCES**

- 134 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) using Isotope Dilution. Alpha SOP 23528.

**LIMITATION OF LIABILITIES**

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

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





### Certification Information

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

**Westborough Facility**

**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene  
**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene, SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene.  
**EPA 8270D:** NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.  
**SM1500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

**Mansfield Facility**

**SM 2540D:** TSS  
**EPA 8082A:** NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.  
**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.  
**EPA TO-12** Non-methane organics  
**EPA 3C** Fixed gases  
**Biological Tissue Matrix:** EPA 3050B

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

**Westborough Facility:**

**Drinking Water**

**EPA 300.6:** Chloride, Nitrate-N, Fluoride, Sulfate, **EPA 353.2:** Nitrate-N, Nitrite-N, **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**  
**EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.  
**Microbiology:** **SM9215B, SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

**Non-Potable Water**

**SM4500H.B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LCHAT 10-107-06-1-B,** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.  
**EPA 624.1** Volatile Halocarbons & Aromatics,  
**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs  
**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil  
**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

**Mansfield Facility:**

**Drinking Water**

**EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg, EPA 522.**

**Non-Potable Water**

**EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.  
**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.  
**EPA 245.1 Hg, SM2340B**

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

## **APPENDIX 3: CHAIN OF CUSTODIES (COC'S)**

# CHAIN OF CUSTODY

PAGE 1 OF 2

**ALPHA**  
WESTBORO, MA  
TEL: 508-898-9220  
FAX: 508-898-9193

MANFELD, MA  
TEL: 508-822-9300  
FAX: 508-822-3288

**Client Information**  
Client: MDE  
Address: 1800 Washington Blvd.  
Baltimore, MD 21230  
Phone: 410-537-3614  
Fax:  
Email: amy.ta.libert@Maryland.gov  
 These samples have been previously analyzed by Alpha

**Project Information**  
Project Name: PFAS study  
Project Location:  
Project #:  
Project Manager:  
ALPHA Quote #:  
**Turn-Around Time**  
 Standard  RUSH (only confirmed if pre-approved)  
Date Due: \_\_\_\_\_ Time: \_\_\_\_\_

Date Rec'd in Lab: 7/8/20 ALPHA Job #: L2028494

**Report Information - Data Deliverables**  
 FAX  EMAIL  
 ADEx  Add'l Deliverables

**Billing Information**  
 Same as Client info PO # \_\_\_\_\_

**Regulatory Requirements/Report Limits**  
State/Fed Program \_\_\_\_\_ Criteria \_\_\_\_\_

| ALPHA Lab ID<br>(Lab Use Only) | Sample ID | Collection |      | Sample Matrix | Sampler's Initials |
|--------------------------------|-----------|------------|------|---------------|--------------------|
|                                |           | Date       | Time |               |                    |
| 28494-01                       | T004      | 7/7        | 6:05 | SW            | RS                 |
| -02                            | FB-6A     | 7/7        | 8:22 | SW            | RS                 |
| -03                            | SL-W1     | 7/7        | 8:22 | SW            | RS                 |
| -04                            | SL-W1R    | 7/7        | 8:27 | SW            | RS                 |
| -05                            | FB-4A     | 7/7        | 8:44 | SW            | RS                 |
| -06                            | T4-W3     | 7/7        | 8:44 | SW            | RS                 |
| -07                            | T4-W2     | 7/7        | 8:52 | SW            | RS                 |
| -08                            | CC-W1     | 7/7        | 9:04 | SW            | RS                 |
| -09                            | T4-W1     | 7/7        | 8:59 | SW            | RS                 |
| -10                            | FB-8C     | 7/7        | 9:14 | SW            | RS                 |

**ANALYSIS**  
PFAS v. LCHMSMS  
Trace type  
Di. In. In.

**SAMPLE HANDLING**  
Filtration \_\_\_\_\_  
 Dryne  
 Not needed  
 Lab to do  
Preservation \_\_\_\_\_  
 Lab to do  
(Please specify below)

Sample Specific Comments

Container Type P  
Preservative A

| Relinquished By:   | Date/Time            | Received By:       | Date/Time            |
|--------------------|----------------------|--------------------|----------------------|
| <u>Ryan Snader</u> | <u>7/7/20 9:45</u>   | <u>Adam Wose</u>   | <u>7/7/20 9:45</u>   |
| <u>Adam Wose</u>   | <u>7/7/20 10:45</u>  | <u>Ryan Snader</u> | <u>7/7/20 10:45</u>  |
| <u>Ryan Snader</u> | <u>7/7/20 11:00</u>  | <u>[Signature]</u> | <u>7/7/20 15:00</u>  |
| <u>[Signature]</u> | <u>7-22-20 17:00</u> | <u>[Signature]</u> | <u>7-22-20 17:00</u> |

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 14-OCT-07)

Page 61 of 66

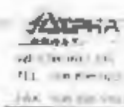
9/20/20 7/7/20 20:30 9/20/20 7/7/20 23:20 7-22-20 17:00 7-22-20 17:00 7-22-20 17:00

# CHAIN OF CUSTODY

22

Date Rec'd in Lab: 7/18/20

ALPHA Job #: L2028494



### Project Information

Project Name: PFAS Pilot Study  
 Project Location:  
 Project #:  
 Project Manager:  
 ALPHA Quota #:

### Report Information - Data Deliverables

FAX  EMAIL  
 ADE  ADE Deliverables

### Billing Information

Same as Client info PG #

### Client Information

Client: MDE  
 Address: 1800 Washington Blvd  
 Beltsville, MD 21236  
 Phone: 410-557-3614  
 Fax:

### Turn-Around Time

Standard  Rush  
 Date Due: Time:

### Regulatory Requirements/Report Limits

State/Fed Program: Criteria:

Other Project Specific Requirements/Comments: Detection Limits

ANALYSIS  
PFAS - NLC, MSH, F, T, S, O, P, B, L, H, M

**SAMPLE HANDLING**

Filtration: \_\_\_\_\_

Done

Not needed

Lab to do

Preservation

Lab to do

Sample Specific Comments:

| ALPHA Lab ID (Lab Use Only) | Sample ID | Collection Date | Time  | Sample Matrix | Sampler's Initials |
|-----------------------------|-----------|-----------------|-------|---------------|--------------------|
| 88498-11                    | WFDS-W6   | 7/7             | 9:14  | SW            | RS                 |
| -12                         | WFDS-W5   | 7/7             | 9:20  | SW            | RS                 |
|                             | FB-WWEFF  | 7/7             | 10:00 | E             | RS                 |
| -13                         | WWTP-EFF  | 7/7             | 10:38 | E             | RS                 |

Checked By: P  
 Prepared By: A


| Relinquished by | Date/Time    | Received By | Date/Time    |
|-----------------|--------------|-------------|--------------|
| Ryan Snader     | 7/7/20 9:45  | Adam Wase   | 7/7/20 9:45  |
| Adam Wase       | 7/7/20 10:45 | Ryan Snader | 7/7/20 10:45 |
| Ryan Snader     | 7/7/20       | [Signature] | 7/7/20 15:00 |

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

Page 52 of 66  
 8/2/2020 20:00 XLAAL 7/20 23:20

## CHAIN OF CUSTODY

PAGE 1 OF 1



WESTBORO, MA  
TEL: 508-898-9220  
FAX: 508-810-9193

MANFIELD, MA  
TEL: 508-822-9100  
FAX: 508-823-3285

**Project Information**

Project Name: **PFAS Study**

Project Location:

Project #:

Project Manager:

ALPHA Quote #:

Date Rec'd in Lab: **7/8/20**

**Report Information - Data Deliverables**

FAX  EMAIL

ADEx  Add'l Deliverables

**Regulatory Requirements/Report Limits**

State/Fed Program: \_\_\_\_\_ Criteria: \_\_\_\_\_

**Client Information**

Client: **MDE**

Address: **1500 Washington Blvd.  
Baltimore, MD 21230**

Phone: **410-537-3614**

Fax:

Email: **amy.laliberte@maryland.gov**

These samples have been previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

**Turn-Around Time**

Standard  RUSH (only confirmed if pre-approved)

Date Due: \_\_\_\_\_ Time: \_\_\_\_\_

**Billing Information**

Same as Client Info  PO #:

| ALPHA Lab ID<br>(Lab Use Only) | Sample ID | Collection |        | Sample Matrix | Sampler's Initials | Sample Specific Comments  |
|--------------------------------|-----------|------------|--------|---------------|--------------------|---|
|                                |           | Date       | Time   |               |                    |   |
| 28495-01                       | FB-W1     | 07-07-20   | 10:02  | SW            | AMC                | <p style="text-align: center;"><b>ANALYSIS</b></p> <p style="text-align: center;">PFAS v LCM/MSMS</p> <p style="text-align: center;">Isotope dilution</p> |
| -02                            | FB-7A     | 7-7-20     | 10:02a | SW            | WN                 |   |
| -03                            | TB002     | 7-7-20     | 06:57c | SW            | AMC                |   |
|                                |           |            |        |               |                    |   |
|                                |           |            |        |               |                    |   |
|                                |           |            |        |               |                    |   |
|                                |           |            |        |               |                    |   |
|                                |           |            |        |               |                    |   |
|                                |           |            |        |               |                    |   |

**Relinquished By:**

*Jim Noonan*  
*Dwight Farrell*  
*Ryan Snader*

Container Type: **P**

Preservative: **A**

**Received By:**

*Bainy Farrell*  
*Ryan Snader*  
*[Signature]*

| Relinquished By       | Date/Time            | Received By          | Date/Time            |
|-----------------------|----------------------|----------------------|----------------------|
| <i>Jim Noonan</i>     | <i>7-7-20 10:30</i>  | <i>Bainy Farrell</i> | <i>7/8/20 10:30</i>  |
| <i>Dwight Farrell</i> | <i>7-7-20 1:00pm</i> | <i>Ryan Snader</i>   | <i>7-7-20 10:30</i>  |
| <i>Ryan Snader</i>    | <i>7/7/20</i>        | <i>[Signature]</i>   | <i>7-7-20 1:50pm</i> |
| <i>[Signature]</i>    | <i>7-7-20 1:30</i>   | <i>[Signature]</i>   | <i>7-7-20-1720</i>   |

FORM NO: 01-01 (rev. 14-OCT-07) Page 36 of 41

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# CHAIN OF CUSTODY - 1 - 2

Date Rec'd in Lab: 7/8/20

ALPHA Job #: L20284



### Project Information

Project Name: PFAS Pilot Study

### Report Information - Data Deliverables

FAX  EMAIL  
 ADEX  Add'l Deliverables

### Billing Information

Same as Client info  PO #

### Client Information

Client: MDE  
 Address: 1802 Washington Blvd  
 Baltimore, MD 21230  
 Phone: 410-537-3614

### Project Location

Project #

Project Manager

ALPHA Quote #

### Turn-Around Time

Standard  RUSH

### Regulatory Requirements/Report Limits

State/Fed Program Criteria

Email: emy.lal.harte@marydel.gov  
 Date Due: \_\_\_\_\_ Time: \_\_\_\_\_

These samples have been previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits

ANALYSIS  
 PFAS v. ALCM/SMS - 1/2016  
 D.L.H.

### SAMPLE HANDLING

- Filteration \_\_\_\_\_  
 Done  
 Not needed  
 Lab to (to)  
 Preservation \_\_\_\_\_  
 Lab to (to)

Sample Specific Comments

| ALPHA Lab ID (Lab Use Only) | Sample ID | Collection Date | Time    | Sample Matrix | Sampler's Initials |
|-----------------------------|-----------|-----------------|---------|---------------|--------------------|
| 8498-01                     | FB-1A     | 7/7/20          | 9:02    |               | BIS                |
| -02                         | T1-W1     | 7/7/20          | 9:02    |               | BIS                |
| -03                         | T1-W2     | 7/7/20          | 9:17    |               | BIS                |
| -04                         | T1-W2R    | 7/7/20          | 9:21    |               | BIS                |
| -05                         | T1-W3     | 7/7/20          | 9:27    |               | BIS                |
| -06                         | FB-3A     | 7/7/20          | 9:43    |               | BIS                |
| -07                         | T3-W4     | 7/7/20          | 9:43    |               | BIS                |
| -08                         | T3-W4R    | 7/7/20          | 9:57    |               | BIS                |
| -09                         | T3-W3     | 7/7/20          | 10:02   |               | BIS                |
| -10                         | TB003     | 7/7/20          | 6:00 am |               | BIS                |

Container Type: P  
 Preservation: A

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

Retrieved By: Barbara Santana 7/7/20 2:00  
 Ryan Snoder 7/7/20 15:00  
 Received By: Ryan Snoder 7/7/20 2:00  
 7/7/20 15:00

FORM NO. 01-000 (REV. 03/00)

Page 1 of 1  
 7/7/20 20:00

8/26 AAL 7/7/20 23:20

7/7/20 23:20

7/7/20 23:20

7/7/20 6:40

# CHAIN OF CUSTODY

PAGE 2 OF 2

Date Rec'd in Lab: 7/8/20

ALPHA Job #: L202849

**ALPHA**  
WESTBORO, MA  
TEL: 508-899-0220  
FAX: 508-899-0193

MANSHFIELD, MA  
TEL: 508-422-9900  
FAX: 508-422-3280

**Project Information**

Project Name: PFAS Pilot Study

**Report Information - Data Deliverables**

FAX  EMAIL  
 ADE  Add'l Deliverables

**Billing Information**

Same as Client info PO #:

**Client Information**

Client: MDE  
Address: 1800 Washington Blvd  
Baltimore, MD 21230  
Phone: 410-537-3614

**Project Location**

Project #

Project Manager

ALPHA Quote #

**Turn-Around Time**

Standard  RUSH (No. of extra fee applied)

Date Due: Time:

Email: amy.lalbert@emerylab.com

These samples have been previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

**Regulatory Requirements/Report Limits**

State/Fed Program: Criteria:

ANALYSIS  
PFAS v. ALCM/SMS - Isotopic  
Dilution

**SAMPLE HANDLING**

Filtration: \_\_\_\_\_  
 Done  
 Not needed  
 Lab to do  
Preservation:  
 Lab to do  
 Lab to do  
(Please specify below)

Sample Specific Comments

| ALPHA Lab ID<br>(Lab Use Only) | Sample ID | Collection |       | Sample<br>Matrix | Sampler's<br>Initials |
|--------------------------------|-----------|------------|-------|------------------|-----------------------|
|                                |           | Date       | Time  |                  |                       |
| -11                            | T3-W2     | 7/7/20     | 10:07 |                  | BS                    |
| -12                            | T3-W1     | 7/7/20     | 10:13 |                  | BS                    |
| -13                            | FB-8A     | 7/7/20     | 10:19 |                  | BS                    |
| -14                            | WFDS-W4   | 7/7/20     | 10:19 |                  | BS                    |
| -15                            | WFDS-W3   | 7/7/20     | 10:25 |                  | BS                    |

Container Type: P  
Preservative: A

| Relinquished By | Date/Time   | Received By  | Date/Time    |
|-----------------|-------------|--------------|--------------|
| Barbara Santana | 7/7/20 2:00 | Byron Snader | 7/7/20 2:00  |
| Byron Snader    | 7/7/20 3:00 |              | 7/7/20 15:00 |
| MCM             | 7-7-20 1:30 |              | 7-7-20 1:30  |
|                 |             |              | 7/7/20 2:20  |

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

## CHAIN OF CUSTODY

PAGE 1 OF 2

**ALPHA**  
WESTBORO, MA  
TEL: 508-896-9200  
FAX: 508-896-9193

**ALPHA**  
MANSFIELD, MA  
TEL: 508-822-8300  
FAX: 508-822-3288

**Project Information**

Project Name: PFAS Pilot Study

Project Location:

Project #:

Project Manager:

ALPHA Quote #:

**Date Rec'd in Lab:** 7/8/20

**ALPHA Job #:** L202849

**Report Information - Data Deliverables**

FAX  EMAIL

ADEx  Add'l Deliverables

**Billing Information**

Billie as Client info  PO #:

**Client Information**

Client: MDE

Address: 416 Chestnut Hill Rd  
Annapolis, MD

Phone: 443-482-2700

Fax:

Email: mary.talib@md.maryland.gov

These samples have been previously analyzed by Alpha

**Turn-Around Time**

Standard  RUSH (only authorized with approval)

Date Due: \_\_\_\_\_ Time: \_\_\_\_\_

Other Project Specific Requirements/Comments/Detection Limits:

**Regulatory Requirements/Report Limits**

State/Fed Program: \_\_\_\_\_ Criteria: \_\_\_\_\_

**ANALYSIS**

PFAS - 4 LIMS/MS - J. Taylor, D. Williams

**SAMPLE HANDLING**

Filtration \_\_\_\_\_

Done

Not needed

Lab to do

Preservation

Lab to do

(Please specify below)

| ALPHA Lab ID<br>(Lab Use Only) | Sample ID | Collection |        | Sample Matrix | Sampler's Initials | Sample Specific Comments |
|--------------------------------|-----------|------------|--------|---------------|--------------------|--------------------------|
|                                |           | Date       | Time   |               |                    |                          |
| -01                            | FB-2A     | 7/7/20     | 9:00am | SW            | SH                 |                          |
| -02                            | TS-W3     | 7/7/20     | 9:00am | SW            | SH                 |                          |
| -03                            | TS-W2     | 7/7/20     | 9:10am | SW            | SH                 |                          |
| -04                            | TS-W1     | 7/7/20     | 9:18am | SW            | SH                 |                          |
| -05                            | FB-2A     | 7/7/20     | 9:31pm | SW            | SH                 |                          |
| -06                            | T2-W3     | 7/7/20     | 9:31am | SW            | SH                 |                          |
| -07                            | T2-W2     | 7/7/20     | 9:36am | SW            | SH                 |                          |
| -08                            | T2-W1     | 7/7/20     | 9:44am | SW            | SH                 |                          |
| -09                            | FB-8B     | 7/7/20     | 9:50am | SW            | SH                 |                          |
| -10                            | WATS-WB   | 7/7/20     | 9:50am | SW            | SA                 |                          |

Container Type: F

Preservative: A

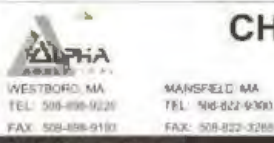
Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

| Relinquished By:    | Date/Time           | Received By:           | Date/Time             |
|---------------------|---------------------|------------------------|-----------------------|
| <u>Steve Hiner</u>  | <u>7/7/20</u>       | <u>Barbara Santana</u> | <u>7/7/20 11:05am</u> |
| <u>Barb Santana</u> | <u>7/7/20 2:00</u>  | <u>Ryan Snader</u>     | <u>7/7/20 2:00</u>    |
| <u>Ryan Snader</u>  | <u>7/7/20 1:30</u>  | <u>[Signature]</u>     | <u>7/7/20 1:50</u>    |
| <u>[Signature]</u>  | <u>7-7-20 11:30</u> | <u>[Signature]</u>     | <u>7-7-20 1:20</u>    |

FORM NO. 01-01 (rev. 14-OCT-07)

Page 62 of 75  
7/7/20 20:00  
7/7/20 2:50





# CHAIN OF CUSTODY

PAGE 2 OF 2

Date Rec'd in Lab: 7/8/20

ALPHA Job #: L2028496

**Client Information**  
 Client: MDE  
 Address: 416 Chincoteague Road Rd  
 Annapolis, MD  
 Phone: 443-482-2700  
 Fax:  
 Email: amy.faliberte@maryland.gov  
 These samples have been previously analyzed by Alpha

**Project Information**  
 Project Name: PFAS Pilot Study  
 Project Location:  
 Project #:  
 Project Manager:  
 ALPHA Quote #:

**Report Information - Data Deliverables**  
 FAX  EMAIL  
 ADEx  Add'l Deliverables

**Billing Information**  
 Same as Client info PO #:

**Turn-Around Time**  
 Standard  RUSH (only confirmed if pre-approved)  
 Date Due: Time:

**Regulatory Requirements/Report Limits**  
 State/Fed Program: Criteria:

Other Project Specific Requirements/Comments/Detection Limits:

**ANALYSIS**  
 PFAS - Low SMS - No duplicate lab

**SAMPLE HANDLING**  
 Filtration: \_\_\_\_\_  
 Done  
 Not needed  
 Lab to do  
 Preservation  
 Lab to do  
(Please specify below)

Sample Specific Comments

| ALPHA Lab ID<br>(Lab Use Only) | Sample ID | Collection |         | Sample Matrix | Sampler's Initials |
|--------------------------------|-----------|------------|---------|---------------|--------------------|
|                                |           | Date       | Time    |               |                    |
| -11                            | WFDS-W1   | 7/7/20     | 9:59 AM | SW            | SH                 |
| -12                            | TB-001    | 7/7/20     | 6:00 AM | S             | SH                 |
|                                |           |            |         |               |                    |
|                                |           |            |         |               |                    |
|                                |           |            |         |               |                    |
|                                |           |            |         |               |                    |
|                                |           |            |         |               |                    |
|                                |           |            |         |               |                    |
|                                |           |            |         |               |                    |

Container Type: P  
 Preservative: RT

| Relinquished By | Date/Time    | Received By  | Date/Time       |
|-----------------|--------------|--------------|-----------------|
| STAVE HIRSH     | 7/7/20       | Barb Santana | 7/7/20 10:58 AM |
| Barb Santana    | 7/7/20 2:00  | Ryan Snader  | 7/7/20 2:00     |
| Ryan Snader     | 7/7/20 11:10 | WJ           | 7/7/20 15:00    |
| CHRYSTAL        | 7-7-20 19:30 | SMITH        | 7-7-20 17:30    |

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev 14-OCT-07)  
 Page 68 of 75  
 9/1/20 AAL 7/7/20 23:20

# CHAIN OF CUSTODY

**ALPHA**  
WESTBORO, MA  
TEL: 508-898-9222  
FAX: 508-898-9190

WANSFLETT, MA  
TEL: 508-822-9300  
FAX: 508-822-3200

**Project Information**  
Project Name: PFAS Pilot Study  
Project Location: St. Marys River  
Project #: \_\_\_\_\_  
Project Manager: Amy Laliber to  
ALPHA Quote #: \_\_\_\_\_

**Report Information - Data Deliverables**  
 FAX  EMAIL  
 ADEx  Add'l Deliverables

**Billing Information**  
 Same as Client info PO #: \_\_\_\_\_

**Client Information**  
Client: Maryland Dept of Envir.  
Address: 416 Chingquapin Road Rd  
Annapolis, md 21401  
Phone: 443-946-2375  
Fax: \_\_\_\_\_  
Email: William.Evans@Maryland.gov

**Turn-Around Time**  
 Standard  RUSH (extra-ordered Lab approval)  
Date Due: \_\_\_\_\_ Time: \_\_\_\_\_

**Regulatory Requirements/Report Limits**  
State/Fed Program: \_\_\_\_\_ Criteria: \_\_\_\_\_

These samples have been previously analyzed by Alpha  
Other Project Specific Requirements/Comments/Detection Limits: \_\_\_\_\_

**ANALYSIS**  
*Isotope Dilution*  
*PFAS vial CMSMS*

**SAMPLE HANDLING**  
Filtration: \_\_\_\_\_  
 Done  
 Not needed  
 Lab to do  
 Preservation  
 Lab to do  
(checkboxes apply below)

| ALPHA Lab ID<br>(Lab Use Only) | Sample ID | Collection |      | Sample Matrix | Sampler's Initials |   | Sample Specific Comments |
|--------------------------------|-----------|------------|------|---------------|--------------------|---|--------------------------|
|                                |           | Date       | Time |               |                    |   |                          |
| 32321- <del>501</del>          | TB101     | 8/10/20    | 600  | X1            | BIS                | ✓ | 14 analytes              |
| 32321- <del>503</del>          | T1-OIFB   | 8/10/20    | 900  | X1            | BIS                | ✓ | 14 analytes              |
| 32321- <del>504</del>          | T1-O1     | 8/10/20    | 9:45 | T             | BIS                | ✓ | 14 analytes              |
| 32321- <del>505</del>          | T1-O1L    | 8/10/20    | 900  | T             | BIS                | ✓ | 14 analytes w/6          |
|                                |           |            |      |               |                    |   |                          |

Container Type: P  
Preservative: A

Please print clearly legibly and plainly. Samples can not be labeled in and turnaround time clock start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

|  |  |  |  |
|--|--|--|--|
| Relinquished By:<br><u>Barbara Santona</u><br><u>Ryan Snader</u> | Date/Time:<br><u>8/10/20 2:00</u><br><u>8/10/20 4:30</u> | Received By:<br><u>Ryan Snader</u><br><u>[Signature]</u> | Date/Time:<br><u>8/10/20 2:00</u><br><u>8/10/20 4:35</u><br><u>8/10/20 20:10</u> |
|--|--|--|--|

FORM NO. 01-01 (REV. 14-OCT-07)  
Page 69 of 80  
William AAL 8/10/20 02:40



# CHAIN OF CUSTODY

PAGE \_\_\_\_\_ OF \_\_\_\_\_

Date Rec'd in Lab: 8/11/20

ALPHA Job #: L203232

WESTBORD, MA  
TEL: 508-898-9229  
FAX: 508-898-9191

MANSFIELD, MA  
TEL: 508-822-9000  
FAX: 508-822-3288

### Project Information

Project Name: PFAS study

Project Location:

Project #:

Project Manager: Amy Laliberte

ALPHA Quote #

### Turn-Around Time

Standard  RUSH (only confirmed if pre-approved)

Date Due: \_\_\_\_\_ Time: \_\_\_\_\_

### Report Information - Data Deliverables

FAX  EMAIL  
 ADEX  Add'l Deliverables

### Billing Information

Same as Client info PO #

### Client Information

Client: MDE

Address: 416 CHANDLER PIN

ANNAPOLIS

Phone: 410-446-0264

Fax:

Email: amy.laliberte@maryland.gov

These samples have been previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

### Regulatory Requirements/Report Limits

State/Fed Program \_\_\_\_\_ Criteria \_\_\_\_\_

ANALYSIS

PFAS via LC/MS/MS - F-Subst. dilution

### SAMPLE HANDLING

Filtration \_\_\_\_\_  
 Done  
 Not needed  
 Lab to do  
Preservation  
 Lab to do  
(Please specify below)

| ALPHA Lab ID<br>(Lab Use Only) | Sample ID | Collection |       | Sample Matrix | Sampler's Initials |   | Sample Specific Comments  |
|--------------------------------|-----------|------------|-------|---------------|--------------------|---|---------------------------|
|                                |           | Date       | Time  |               |                    |   |                           |
| 32321-078                      | FB-01     | 8-10-20    | 10:20 | AMS           | AMC                | ✓ | 36 ANALYTES               |
| 32321-079                      | FB-01 L   | 8-10-20    | 10:20 | AMS           | AMC                | ✓ | 36 ANALYTES               |
| 32321-080                      | FB-01 FB  | 8/10/20    | 10:20 | XI            | AMC                | ✓ | 36 <sup>14</sup> ANALYTES |
| 32321-081                      | T B103    | 8/10/20    | 10:20 | XI            | AMC                | ✓ | 14 ANALYTES               |
|                                | SO        |            |       |               |                    |   |                           |

Container Type: P  
Preservative: A

Please print clearly, legibly and completely. Samples can not be in and turnaround time clock start until any ambiguities are cleared. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

| Relinquished By: | Date/Time | Received By:   | Date/Time |
|------------------|-----------|----------------|-----------|
| J. Medina        | 8-10-2020 | Barney Fairall |           |
| Barney Fairall   | 8/10-2020 | Ryan Snader    | 1:41      |
| Ryan Snader      | 8/10/20   |                |           |
|                  | 8/10/20   |                |           |

11:40 AM 8/10/20 02:40

# CHAIN OF CUSTODY

PAGE \_\_\_\_\_ OF \_\_\_\_\_

Date Rec'd in Lab: 8/11/20

ALPHA Job #: L203232

**ALPHA**  
WESTBORO, MA  
TEL: 508-896-0220  
FAX: 508-896-0183

WANSFIELD, MA  
TEL: 508-422-9300  
FAX: 508-422-3288

### Project Information

Project Name: **PFAS STUDY**  
Project Location:  
Project #:  
Project Manager: **Amy Lubberte**  
ALPHA Quote #:

### Report Information - Data Deliverables

FAX  EMAIL  
 ADEX  Add'l Deliverables

### Billing Information

Same as Client info PO #:

### Client Information

Client: **MIDE**  
Address: **1800 WASHINGTON RD  
BALTIMORE, MD 21230**  
Phone: **410 537 3614**  
Fax:  
Email: **amy.lubberte@maryland.gov**  
 These samples have been previously analyzed by Alpha

### Turn-Around Time

Standard  RUSH (add. charges for expeditious)  
Date Due: Time:

### Regulatory Requirements/Report Limits

State/Fed Program: Criteria:

Other Project Specific Requirements/Comments/Detection Limits:

ANALYSIS  
PFAS VIA LC/MS/MS - 12/10/19

### SAMPLE HANDLING

- Filtration
  - Done
  - Not needed
  - Preservation
  - Lab to do
- (Please specify below)

| ALPHA Lab ID<br>(Lab Use Only) | Sample ID | Collection |       | Sample Matrix | Sampler's Initials |   | Sample Specific Comments |
|--------------------------------|-----------|------------|-------|---------------|--------------------|---|--------------------------|
|                                |           | Date       | Time  |               |                    |   |                          |
| 32321-0109                     | TB-100    | 8/10/20    | 06:00 | X1            | SH                 | ✓ | 14 Analytes              |
| 32321-0170                     | TS-01-FB  | 8/10/20    | 8:45  | X1            | SH                 | ✓ | 14 Analytes              |
| 32321-0311                     | TS-01L    | 8/10/20    | 09:05 | T             | SH                 | ✓ | 36 Analytes              |
| 32321-0343                     | TS-01     | 8/10/20    | 09:05 | T             | SH                 | ✓ | 36 Analytes              |
| 32321-0413                     | T2-01 FB  | 8/10/20    | 09:23 | X1            | SH                 | ✓ | 14 Analytes              |
| 32321-0516                     | T2-01     | 8/10/20    | 09:30 | T             | SH                 | ✓ | 14 Analytes              |
| 32321-0517                     | T2-01:-   | 8/10/20    | 09:30 | T             | SH                 | ✓ | 14 Analytes              |


Container Type: **P**  
Preservative: **A**

Please print clearly, legibly and completely. Samples can not be held in and turnaround time does not start until any ambiguity is resolved. All samples submitted must adhere to Alpha's Terms and Conditions. See reverse side.

|  |  |  |   |
|--|--|--|---|
| Relinquished By:<br><b>Steve Hiner</b><br><b>Ryan Snader</b> | Date/Time:<br>8/10/20 11:00<br>8/10/20 7:30<br>8/11/20 2010<br>8/10/20 | Received By:<br><b>Ryan Snader</b><br><b>[Signature]</b><br><b>[Signature]</b> | Date/Time:<br>8/10/20 11:00<br>8/10/20 12:30<br>8/10/20 2010<br>8/10/20 23:00 |
|--|--|--|---|

## CHAIN OF CUSTODY

PAGE \_\_\_\_\_ OF \_\_\_\_\_



WESTBORO, MA  
TEL: 508-888-9229  
FAX: 508-288-0393

MANSHFIELD, MA  
TEL: 508-822-9300  
FAX: 508-823-5286

**Project Information**

Project Name: **PFAS Study**

Project Location: \_\_\_\_\_

Project #: \_\_\_\_\_

Project Manager: **Amy Laliberte**

ALPHA Quote #: \_\_\_\_\_

**Turn-Around Time**

Standard  RUSH (only confirmed if pre-approved)

Date Due: \_\_\_\_\_ Time: \_\_\_\_\_

Date Rec'd in Lab: **8/11/20**

**Report Information - Data Deliverables**

FAX  EMAIL

ADEx  Add'l Deliverables

**Regulatory Requirements/Report Limits**

State/Fed Program: \_\_\_\_\_ Criteria: \_\_\_\_\_

**ALPHA Job #: L20323a1**

**Billing Information**

Same as Client info  PO # \_\_\_\_\_

**Client Information**

Client: **MDE**

Address: **1800 Washington Ave.  
Baltimore, MD 21230**

Phone: **410-537-3614**

Fax: \_\_\_\_\_

Email: **amy.laliberte@maryland.gov**

These samples have been previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits: \_\_\_\_\_

ANALYSIS  
PFAS via LC/MS/MS  
Isotope dilution

**SAMPLE HANDLING**

Filtration \_\_\_\_\_

Done

Not needed

Lab to do

Preservation \_\_\_\_\_

Lab to do

(Please specify limits)

| ALPHA Lab ID<br>(Lab Use Only) | Sample ID   | Collection |        | Sample Matrix | Sampler's Initials |   | Sample Specific Comments |
|--------------------------------|-------------|------------|--------|---------------|--------------------|---|--------------------------|
|                                |             | Date       | Time   |               |                    |   |                          |
| 32321-16                       | SC-01       | 8/10       | 9:00   | T             | RS                 | ✓ | 14 analytes              |
| 32321-17                       | SC-01L      | 8/10       | 9:00   | T             | RS                 | ✓ | 14 analytes w/ligand     |
| 32321-18                       | WFWWTP-01   | 8/10       | 10:15  | T             | RS                 | ✓ | 14 analytes              |
| 32321-19                       | WFWWTP-01L  | 8/10       | 10:15  | T             | RS                 | ✓ | 14 analytes w/ligand     |
| 32321-20                       | CC-01       | 8/10       | 9:45   | T             | RS                 | ✓ | 14 analytes              |
| 32321-21                       | CC-01L      | 8/10       | 9:45   | T             | RS                 | ✓ | 14 analytes w/ligand     |
|                                | SC-01FB     | 8/10       | 9:00   | X1            | RS                 | ✓ | 14 analytes              |
|                                | WFWWTP-01FB | 8/10       | 10:15  | X1            | RS                 | ✓ | 14 analytes              |
|                                | CC-01FB     | 8/10       | 9:45   | X1            | RS                 | ✓ | 14 analytes              |
|                                | ITB102      | 8/10       | 6:00am | X1            | RS                 | ✓ | 14 analytes              |

Container Type: **P**

Preservative: **A**

Please print clearly, legibly, and completely. Samples can not be held in cold turnaround time clock will start only if all analytes are present. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

| Relinquished By:   | Date/Time      | Received By:       | Date/Time     |
|--------------------|----------------|--------------------|---------------|
| <b>Ryan Snoddy</b> | 8/10/2014 2:30 | <i>[Signature]</i> | 8/10/20 14:15 |
| <i>[Signature]</i> | 8/10/20        | <i>[Signature]</i> | 8/10/20 23:00 |
| <i>[Signature]</i> | 8/10/20 02:40  | <i>[Signature]</i> | 8/10/20 02:50 |

**ALPHA**  
 WESTBORO, MA  
 TEL: 508-898-9220  
 FAX: 508-898-9193

MANCHESTER, MA  
 TEL: 508-422-9300  
 FAX: 508-422-3288

# CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd In Lab: 8/12/20 <sup>1/2</sup>

Serial No: 08252013149  
 ALPHA Job #: L205230

## Project Information

Project Name: PFAS Pilot Study  
 Project Location:  
 Project #:  
 Project Manager: Amy Laliberte  
 ALPHA Quote #:

## Report Information - Data Deliverables

FAX  EMAIL  
 ADEK  Add'l Deliverables

## Billing Information

Same as Client info  PO #:

## Client Information

Client: MDE  
 Address: 416 CHINQUAPIN  
 ANNAPOLIS MD  
 Phone: 410-446-0264  
 Fax:  
 Email: amy.laliberte@maryland.gov

## Turn-Around Time

Standard  RUSH (only available if pre-approved)  
 Date Due: Time:

## Regulatory Requirements/Report Limits

State / Fed Program: Criteria:

Other Project Specific Requirements/Comments/Detection Limits:

ANALYSIS PFAS via LC/MS/MS - Isotope Dilution

| ALPHA Lab ID (Lab Use Only) | Sample ID | Collection Date | Collection Time | Sample Matrix | Sampler's Initials | Sample Specific Comments |
|-----------------------------|-----------|-----------------|-----------------|---------------|--------------------|--------------------------|
| 32501-01                    | FB-W1     | 8-11-20         | 9:36            | SW WATER      | AMC                | 36 ANALYTES              |
| 32501-02                    | FB-01     | 8-11-20         | 9:36            | OYS           | AMC                | 36 ANALYTES              |
| 32501-03                    | FB-D1L    | 8-11-20         | 9:36            | OYS           | AMC                | 36 ANALYTES              |
| 32501-04                    | TB-201    | 8-11-20         | 6:30            | X1            | AMC                | 36 Analytes              |
| 32501-09                    | FB-7A     | 8-4-20          | 9:36            | X1            | AMC                | 36 Analytes              |

**SAMPLE HANDLING**  
 Filtration:  Done  Not needed  
 Lab to do Preservation  Lab to do  
 (Please specify below)

MDE 8/12/20 1545 REC MDM 8/12/20 1545

Container Type: P  
 Preservative: A

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

| Relinquished By:   | Date/Time     | Received By:       | Date/Time     |
|--------------------|---------------|--------------------|---------------|
| <i>[Signature]</i> | 8-11-20 9:36  | <i>[Signature]</i> | 8/12/20 10:36 |
| <i>[Signature]</i> | 8/11/20 12:00 | <i>[Signature]</i> | 8/11/20 12:00 |
| <i>[Signature]</i> | 8/11/20 14:50 | <i>[Signature]</i> | 8-11-20 14:50 |
| <i>[Signature]</i> | 8-11-20       | <i>[Signature]</i> | 8-11-20 17:00 |

8/12/20

REL: 05/05/2010 1545 REC: MARY BALDWIN 8/10/20 1545 REC: MARY BALDWIN 8/10/20 1545 REC: MARY BALDWIN 8/10/20 1545

## CHAIN OF CUSTODY

PAGE 2 OF 2

**ALPHA**  
WESTBORO, MA  
TEL: 508-899-0250  
FAX: 508-899-0193

WANSFLELD, MA  
TEL: 508-822-9300  
FAX: 508-822-3299

**Project Information**

Project Name: PFAS study

Project Location:

Project #:

Project Manager: amy laborte

ALPHA Quote #:

**Turn-Around Time**

Standard  RUSH (only confirmed if pre-approved)

Date Due: \_\_\_\_\_ Time: \_\_\_\_\_

**Date Rec'd in Lab:** 8/13/20

**ALPHA Job #:** 182030

**Report Information - Data Deliverables**

FAX  EMAIL

ADEx  Add'l Deliverables

**Regulatory Requirements/Report Limits**

State/Fed Program: \_\_\_\_\_ Criteria: \_\_\_\_\_

**Client Information**

Client: MDE

Address: 1800 Washington Blvd.  
Baltimore MD 21230

Phone: 410-537-3614

Fax: \_\_\_\_\_

Email: amy.laborte@maryland.gov

These samples have been previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

| ALPHA Lab ID<br>(Lab Use Only) | Sample ID | Collection |       | Sample Matrix | Sampler's Initials |   |  |  | Sample Specific Comments |
|--------------------------------|-----------|------------|-------|---------------|--------------------|---|--|--|--------------------------|
|                                |           | Date       | Time  |               |                    |   |  |  |                          |
| 32501-06                       | TB-200    | 8/11/20    | 6:00  | XI            | RS                 | ✓ |  |  | 14 analytes              |
| 32501-07                       | HP-OIL    | 8/11/20    | 10:00 | T             | RS                 | ✓ |  |  | 36 analytes              |
| 32501-08                       | HP-OI     | 8/11/20    | 10:00 | T             | RS                 | ✓ |  |  | 36 analytes              |
| 32501-09                       | FB-9A     | 8/11/20    | 10:00 | XI            | RS                 | ✓ |  |  | 36 analytes              |
| 32501-10                       | HP-WI     | 8/11/20    | 10:00 | SW            | RS                 | ✓ |  |  | 36 analytes              |
| 32501-11                       | FB-9B     | 8/11/20    | 9:00  | XI            | RS                 | ✓ |  |  | 14 analytes              |
| 32501-12                       | DP-WI     | 8/11/20    | 9:00  | SW            | RS                 | ✓ |  |  | 14 analytes              |

ANALYSIS  
 PFAS VIA ICM'S MS-TOX  
 dilution

- SAMPLE HANDLING**
- Filtration: \_\_\_\_\_
- Dope
  - Not needed
  - Lab to do
  - Preservation
  - Lab to do
- (Please specify below)

Container Type: P

Preservative: A

|                    |                      |                    |                      |
|--------------------|----------------------|--------------------|----------------------|
| Relinquished By:   | Date/Time:           | Received By:       | Date/Time:           |
| <u>Ryan Snider</u> | <u>8/11/20 14:50</u> | <u>Rachel HPC</u>  | <u>8/11/20 14:50</u> |
| <u>Ray Snider</u>  | <u>8/11/20</u>       | <u>[Signature]</u> | <u>8/11/20 19:00</u> |
| <u>[Signature]</u> | <u>8/13/20 13:11</u> | <u>[Signature]</u> | <u>8/12/20 13:11</u> |

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

# CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd In Lab: 8/12/20 <sup>1/2</sup>

Serial No: 08312016138  
ALPHA Job #: L203230

**ALPHA**  
WESTBORO, MA  
TEL: 508-898-9220  
FAX: 508-898-9193

MANCHESTER, MA  
TEL: 508-822-9300  
FAX: 508-822-3288

## Project Information

Project Name: PFAS Pilot Study  
Project Location:  
Project #:  
Project Manager: Amy Laliberte  
ALPHA Quote #:

## Report Information - Data Deliverables

FAX  EMAIL  
 ADEK  Add'l Deliverables

## Billing Information

Same as Client info  PO #:

## Client Information

Client: MDE  
Address: 416 CHINQUAPIN  
ANNAPOLIS MD  
Phone: 410-446-0264  
Fax:  
Email: amy.laliberte@maryland.gov

Project #:  
Project Manager: Amy Laliberte  
ALPHA Quote #:

## Turn-Around Time

Standard  RUSH (only available if pre-approved)  
Date Due: Time:

## Regulatory Requirements/Report Limits

State / Fed Program: Criteria:

Other Project Specific Requirements/Comments/Detection Limits:

ANALYSIS

PFAS via LC/MS/MS - Isotope Dilution

## SAMPLE HANDLING

Filtration:  Done  Not needed  
 Lab to do Preservation  Lab to do  
(Please specify below)

| ALPHA Lab ID<br>(Lab Use Only) | Sample ID | Collection |      | Sample Matrix | Sampler's Initials |   | Sample Specific Comments |
|--------------------------------|-----------|------------|------|---------------|--------------------|---|--------------------------|
|                                |           | Date       | Time |               |                    |   |                          |
| 32501-01                       | FB-W1     | 8-11-20    | 9:36 | SW WATER      | AMC                | ✓ | 36 ANALYTES              |
| 32501-02                       | FB-01     | 8-11-20    | 9:36 | OYS           | AMC                | ✓ | 36 ANALYTES              |
| 32501-03                       | FB-D1L    | 8-11-20    | 9:36 | OYS           | AMC                | ✓ | 36 ANALYTES              |
| 32501-04                       | TB-201    | 8-11-20    | 6:30 | X1            | AMC                | ✓ | 36 Analytes              |
| 32501-09                       | FB-7A     | 8-11-20    | 9:36 | X1            | AMC                | ✓ | 36 Analytes              |

Container Type: P  
Preservative: A

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

| Relinquished By:   | Date/Time     | Received By:       | Date/Time     |
|--------------------|---------------|--------------------|---------------|
| <i>[Signature]</i> | 8-11-20 9:36  | <i>[Signature]</i> | 8/12/20 10:36 |
| <i>[Signature]</i> | 8/11/20 12:00 | <i>[Signature]</i> | 8/11/20 12:00 |
| <i>[Signature]</i> | 8/11/20 14:50 | <i>[Signature]</i> | 8-11-20 14:50 |
| <i>[Signature]</i> | 8-11-20       | <i>[Signature]</i> | 8-11-20 17:00 |

8/12/20



REL: C50 Deaq Atl 8/10/20 1545 REC Mgrt Bldg 1653 8/11/20 16:53

## CHAIN OF CUSTODY

PAGE 2 OF 2

**ALPHA**  
WESTBORO, MA  
TEL: 508-899-0250  
FAX: 508-899-0193

WANSFELD, MA  
TEL: 508-822-9300  
FAX: 508-822-3299

**Project Information**

Project Name: PFAS study

Project Location:

Project #:

Project Manager: amy laborte

ALPHA Quote #:

**Turn-Around Time**

Standard  RUSH (only confirmed if an appointment)

Date Due: \_\_\_\_\_ Time: \_\_\_\_\_

**Date Rec'd in Lab:** 8/13/20

**ALPHA Job #:** 182030

**Report Information - Data Deliverables**

FAX  EMAIL

ADEx  Add'l Deliverables

**Regulatory Requirements/Report Limits**

State/Fed Program: \_\_\_\_\_ Criteria: \_\_\_\_\_

**Client Information**

Client: MDE

Address: 1800 Washington Blvd.  
Baltimore MD 21230

Phone: 410-537-3614

Fax: \_\_\_\_\_

Email: amy.laborte@maryland.gov

These samples have been previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

| ALPHA Lab ID<br>(Lab Use Only) | Sample ID | Collection |       | Sample Matrix | Sampler's Initials |   |  |  | Sample Specific Comments |
|--------------------------------|-----------|------------|-------|---------------|--------------------|---|--|--|--------------------------|
|                                |           | Date       | Time  |               |                    |   |  |  |                          |
| 32501-06                       | TB-200    | 8/11/20    | 6:00  | XI            | RS                 | ✓ |  |  | 14 analytes              |
| 32501-07                       | HP-OIL    | 8/11/20    | 10:00 | T             | RS                 | ✓ |  |  | 36 analytes              |
| 32501-08                       | HP-OI     | 8/11/20    | 10:00 | T             | RS                 | ✓ |  |  | 36 analytes              |
| 32501-09                       | FB-9A     | 8/11/20    | 10:00 | XI            | RS                 | ✓ |  |  | 36 analytes              |
| 32501-10                       | HP-WI     | 8/11/20    | 10:00 | SW            | RS                 | ✓ |  |  | 36 analytes              |
| 32501-11                       | FB-9B     | 8/11/20    | 9:00  | XI            | RS                 | ✓ |  |  | 14 analytes              |
| 32501-12                       | DP-WI     | 8/11/20    | 9:00  | SW            | RS                 | ✓ |  |  | 14 analytes              |

ANALYSIS  
PFAS VIA LCMS/MS - 7500g dilution

**SAMPLE HANDLING**

Filtration: \_\_\_\_\_

Dope

Not needed

Lab to do

Preservation

Lab to do

(Please specify below)

Container Type: P

Preservative: A

|                    |                      |                   |                      |
|--------------------|----------------------|-------------------|----------------------|
| Relinquished By:   | Date/Time            | Received By:      | Date/Time            |
| <u>Ryan Snader</u> | <u>8/11/20 14:50</u> | <u>Rachel HPC</u> | <u>8/11/20 14:50</u> |
| <u>Ray</u>         | <u>8/11/20</u>       | <u>Ray</u>        | <u>8/11/20 19:00</u> |
| <u>Deac</u>        | <u>8/13/20 13:11</u> | <u>Deac</u>       | <u>8/13/20 13:11</u> |

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

**CHAIN OF CUSTODY** PAGE 1 OF 1

ALPHA  
WESTBORO, MA  
TEL: 508-699-9226  
FAX: 508-699-8193

MANFIELD, MA  
TEL: 508-522-4300  
FAX: 508-522-3288

Date Rec'd in Lab: 8/19/20

ALPHA Job #: L9033550

**Client Information**

Client: MDE  
Address: 1800 Washington Blvd  
Baltimore, MD 21230  
Phone: 410-537-3614  
Fax:  
Email: amy.laliberte@maryland.gov  
 These samples have been previously analyzed by Alpha

**Project Information**

Project Name: PFAS Study  
Project Location:  
Project #:  
Project Manager: Amy Laliberte  
ALPHA Quote #:

**Report Information - Data Deliverables**

FAX  EMAIL  
 ADEx  ADEx Deliverables

**Billing Information**

Same as Client info PO #:

**Regulatory Requirements/Report Limits**

State/Fed Program: Criteria:

**Turn-Around Time**

Standard  RUSH (only used if per approval)  
Date Due: Time:

Other Project Specific Requirements/Comments/Detection Limits:

**ANALYSIS**  
PFAS Total Contaminants  
Isotope  
Chlorine

**SAMPLE HANDLING**  
Filtration:  
 Done  
 Not needed  
 Lab to do  
Preservation:  
 Lab to do  
(Please specify below)

| ALPHA Lab ID (Lab Use Only) | Sample ID | Collection Date | Time  | Sample Matrix | Sampler's Initials | Sample Specific Comments |
|-----------------------------|-----------|-----------------|-------|---------------|--------------------|--------------------------|
| 33550-a                     | TB-203    | 8/18/20         | 7:00  | X1            | RS                 | HOLD 14 Analytes         |
| -a                          | FB-9B     | 8/18/20         | 10:40 | X1            | RS                 | HOLD 14 Analytes         |
| -b                          | DP-OIL    | 8/18/20         | 10:40 | T             | RS                 | 14 Analytes              |
| -c                          | DP-OI     | 8/18/20         | 10:40 | T             | RS                 | 14 Analytes              |

Container Type: P  
Preservative: A

Relinquished By: Ryan Snader  
Date/Time: 8/18/20 11:10  
Received By: Tom Claf AAL  
Date/Time: 8/18/20 19:10  
TC/PCR AAL 8/18/20 13:11  
8/18/20 2:11  
John AAL 8/18/20 20:30  
8/18/20 23:50

Please print clearly, legibly and completely. Samples cannot be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

**APPENDIX 4: TARGET ANALYTE LIST, ANALYTICAL  
METHODOLOGY, AND SUPPORTING DOCUMENTATION**

APPENDIX 1: Target Analyte List, Analytical Methodology, and Supporting Documentation

**Per- and Polyfluoroalkyl Substances (PFAS) Substance Surface Water and Oyster Analysis  
Target Analyte List (TAL) and Methodology**

The TAL of PFAS compounds utilized in this study will comprise 2 suites of PFAS compounds. The 2 TAL suites consist of 14 PFAS and 36 PFAS analytes (See the 4 attached tables identifying the PFAS TALs and approximate method detection limits for water and oysters). The 36 PFAS suite contains all the 14 PFAS compounds in the abbreviated list as well as 22 additional PFAS compounds. Exact locations identifying which samples will be analyzed utilizing each TAL suite are detailed in Table 1 of the St. Mary's River Pilot Per- and Polyfluoroalkyl Substances (PFAS) Study. Additionally, a brief narrative of the sample preparation and analytical methodology is presented in the supporting attachment.



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 File: PBR343-1  
 Page: 1

PFAAs via LCMSMS-Isotope Dilution (WATER)

Holding Time: 14 days  
 Container/Sample Preservation: 1 / 2 Plastic / normal / Hst col: H2O / Trama

| Analyte  | CAS #     | RL | MDL    | Units | LCS Criteria | LCS RPD | MS Criteria | MS RPD | Duplicate RPD | Surrogate Criteria |
|--|-----------|----|--------|-------|--------------|---------|-------------|--------|---------------|--------------------|
| Perfluorobutanesulfonic Acid (PFBS)                        | 375-73-5  | 2  | 0.284  | ng/l  | 70-130       | 3C      | 70-130      | 30     | 30            |                    |
| Perfluoropentanesulfonic Acid (PFPeSA)                     | 307-24-4  | 2  | 0.2832 | ng/l  | 70-130       | 3C      | 70-130      | 30     | 30            |                    |
| Perfluorohexanesulfonic Acid (PFHxSA)                      | 375-80-9  | 2  | 0.46   | ng/l  | 70-130       | 3C      | 70-130      | 30     | 30            |                    |
| Perfluorooctanesulfonic Acid (PFOS)                        | 335-17-1  | 2  | 0.48   | ng/l  | 70-130       | 3C      | 70-130      | 30     | 30            |                    |
| Perfluorodecane sulfonic Acid (PFDS)                       | 375-83-7  | 2  | 0.476  | ng/l  | 70-130       | 3C      | 70-130      | 30     | 30            |                    |
| Perfluorododecane sulfonic Acid (PFDDA)                    | 1783-23-1 | 2  | 0.492  | ng/l  | 70-130       | 3C      | 70-130      | 30     | 30            |                    |
| Perfluorotetradecane sulfonic Acid (PFTeDA)                | 335-16-2  | 2  | 0.644  | ng/l  | 70-130       | 3C      | 70-130      | 30     | 30            |                    |
| N-Methyl Perfluorooctanesulfonamide sulfonic Acid (NMPFOA) | 2358-11-9 | 2  | 0.536  | ng/l  | 70-130       | 3C      | 70-130      | 30     | 30            |                    |
| Perfluorooctanoic Acid (PFOA)                              | 298-11-8  | 2  | 0.516  | ng/l  | 70-130       | 3C      | 70-130      | 30     | 30            |                    |
| N-Ethyl Perfluorooctanesulfonamide sulfonic Acid (NETFOA)  | 299-58-6  | 2  | 0.552  | ng/l  | 70-130       | 3C      | 70-130      | 30     | 30            |                    |
| Perfluorooctane sulfonic Acid (PFOS)                       | 307-55-1  | 2  | 0.648  | ng/l  | 70-130       | 3C      | 70-130      | 30     | 30            |                    |
| Perfluorododecane sulfonic Acid (PFDS)                     | 1783-23-1 | 2  | 0.492  | ng/l  | 70-130       | 3C      | 70-130      | 30     | 30            |                    |
| Perfluorotetradecane sulfonic Acid (PFTeDA)                | 335-16-2  | 2  | 0.644  | ng/l  | 70-130       | 3C      | 70-130      | 30     | 30            |                    |
| Perfluorohexadecane sulfonic Acid (PFHxDA)                 | ALN/A     |    |        |       |              |         |             |        |               | 70-130             |
| Perfluorooctadecane sulfonic Acid (PFODSA)                 | ALN/A     |    |        |       |              |         |             |        |               | 70-130             |
| D,Decafluoroheptane 1,1-dithiolane-2-thione sulfonic Acid  | ALN/A     |    |        |       |              |         |             |        |               | 70-130             |

Please Note that the RL information provided in this table is calculated using a 100% Solids factor (Sol/Solids only)  
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PFAAs via LCHS/MS-Isotope Dilution (WATER)

Holding Time: 14 days  
 Container/Sample Preservation: 1 2 Plastic/1 Plastic/1 H2O Plastic

| Analyte   | CAS # | RL | MDL | Units | LCS Criteria | LCS RPD | MS Criteria | MS RPD | Duplicate RPD | Surrogate Criteria |
|---|-------|----|-----|-------|--------------|---------|-------------|--------|---------------|--------------------|
| Perfluoro(1,1,1,2,2,2-hexafluoroethyl)acetic acid (PFHxAc)            | None  |    |     |       |              |         |             |        |               | 21-745             |
| Perfluoro(1,1,1,2,2,2-hexafluoroethyl)acetic acid (PFHxAc)            | None  |    |     |       |              |         |             |        |               | 20-130             |
| Perfluoro(1,1,1,2,2,2-hexafluoroethyl)acetic acid (PFHxAc)            | None  |    |     |       |              |         |             |        |               | 49-232             |
| Perfluoro(1,1,2,2,2-pentafluoroethyl)acetic acid (PFPeAc)             | None  |    |     |       |              |         |             |        |               | 26-143             |
| 1H,1H,2H,2H-Perfluoro(1,1,2,2,2-pentafluoroethyl)acetic acid (PFPeAc) | None  |    |     |       |              |         |             |        |               | 1-296              |
| Perfluoro(1,1,2,2,2-pentafluoroethyl)acetic acid (PFPeAc)             | None  |    |     |       |              |         |             |        |               | 24-246             |
| Perfluoro(1,1,2,2,2-pentafluoroethyl)acetic acid (PFPeAc)             | None  |    |     |       |              |         |             |        |               | 42-746             |
| Perfluoro(1,1,2,2,2-pentafluoroethyl)acetic acid (PFPeAc)             | None  |    |     |       |              |         |             |        |               | 28-744             |
| 1H,1H,2H,2H-Perfluoro(1,1,2,2,2-pentafluoroethyl)acetic acid (PFPeAc) | None  |    |     |       |              |         |             |        |               | 7-733              |
| 1H,1H,2H,2H-Perfluoro(1,1,2,2,2-pentafluoroethyl)acetic acid (PFPeAc) | None  |    |     |       |              |         |             |        |               | 1-191              |
| Perfluoro(1,1,2,2,2-pentafluoroethyl)acetic acid (PFPeAc)             | None  |    |     |       |              |         |             |        |               | 40-744             |
| Perfluoro(1,1,2,2,2-pentafluoroethyl)acetic acid (PFPeAc)             | None  |    |     |       |              |         |             |        |               | 1-87               |
| Perfluoro(1,1,2,2,2-pentafluoroethyl)acetic acid (PFPeAc)             | None  |    |     |       |              |         |             |        |               | 23-246             |
| Perfluoro(1,1,2,2,2-pentafluoroethyl)acetic acid (PFPeAc)             | None  |    |     |       |              |         |             |        |               | 24-161             |
| Perfluoro(1,1,2,2,2-pentafluoroethyl)acetic acid (PFPeAc)             | None  |    |     |       |              |         |             |        |               | 77-747             |
| 2,2,3,3-Tetrafluoro(1,1,1,2,2,2-hexafluoroethyl)acetic acid (PFOSAc)  | None  |    |     |       |              |         |             |        |               | 20-150             |
| Perfluoro(1,1,2,2,2-pentafluoroethyl)acetic acid (PFPeAc)             | None  |    |     |       |              |         |             |        |               | 50-150             |
| Perfluoro(1,1,2,2,2-pentafluoroethyl)acetic acid (PFPeAc)             | None  |    |     |       |              |         |             |        |               | 40-150             |
| 2,2,3,3-Tetrafluoro(1,1,1,2,2,2-hexafluoroethyl)acetic acid (PFOSAc)  | None  |    |     |       |              |         |             |        |               | 20-150             |
| 2,2,3,3-Tetrafluoro(1,1,1,2,2,2-hexafluoroethyl)acetic acid (PFOSAc)  | None  |    |     |       |              |         |             |        |               | 50-150             |
| 2,2,3,3-Tetrafluoro(1,1,1,2,2,2-hexafluoroethyl)acetic acid (PFOSAc)  | None  |    |     |       |              |         |             |        |               | 20-150             |

Please Note that the RL information provided in this table is calculated using a 100% Spike Factor. (Spike/Solids only)  
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 File: PBR34B-1  
 Page: 1

PFAAs via LCHMS-Isotope Dilution (TTSUUE)

Holding Time: 28 days  
 Container/Sample Preservation: 1 Plastic 800 unpreserved

| Analyte  | CAS #     | RL | MDL    | Units | LCS Criteria | LCS RPD | MS Criteria | MS RPD | Duplicate RPD | Surrogate Criteria |
|--|-----------|----|--------|-------|--------------|---------|-------------|--------|---------------|--------------------|
| Perfluorobutanesulfonic Acid (PFBS)                                    | 375-73-5  | L  | 0.039  | ng/g  | 72-128       | 3C      | 72-128      | 30     | 30            |                    |
| Perfluoropentanesulfonic Acid (PFPeSA)                                 | 301-24-4  | L  | 0.0525 | ng/g  | 70-132       | 3C      | 70-132      | 30     | 30            |                    |
| Perfluorohexanesulfonic Acid (PFHxSA)                                  | 335-01-9  | L  | 0.0643 | ng/g  | 71-131       | 3C      | 71-131      | 30     | 30            |                    |
| Perfluoroheptanesulfonic Acid (PFHpSA)                                 | 355-48-4  | L  | 0.0805 | ng/g  | 67-130       | 3C      | 67-130      | 30     | 30            |                    |
| Perfluorooctanesulfonic Acid (PFOSA)                                   | 335-87-1  | L  | 0.0939 | ng/g  | 69-133       | 3C      | 69-133      | 30     | 30            |                    |
| Perfluorononanesulfonic Acid (PFNSA)                                   | 335-85-7  | L  | 0.075  | ng/g  | 72-129       | 3C      | 72-129      | 30     | 30            |                    |
| Perfluorodecane sulfonic Acid (PFDS)                                   | 1783-23-1 | L  | 0.13   | ng/g  | 68-136       | 3C      | 68-136      | 30     | 30            |                    |
| Perfluorododecane sulfonic Acid (PFDDA)                                | 335-16-2  | L  | 0.067  | ng/g  | 69-133       | 3C      | 69-133      | 30     | 30            |                    |
| n-Hexyl Perfluorooctanesulfonate/Hexadecane sulfonic Acid (NHxPFOSA)   | 2358-11-9 | L  | 0.2015 | ng/g  | 83-144       | 3C      | 83-144      | 30     | 30            |                    |
| Perfluorotetradecane sulfonic Acid (PFTSA)                             | 2755-91-8 | L  | 0.0948 | ng/g  | 67-136       | 3C      | 67-136      | 30     | 30            |                    |
| n-Undecyl Perfluorododecane sulfonate/Undecylsulfonic Acid (n-UDPFOSA) | 199-58-6  | L  | 0.0845 | ng/g  | 61-139       | 3C      | 61-139      | 30     | 30            |                    |
| Perfluorooctadecane sulfonic Acid (PFOSa)                              | 307-55-1  | L  | 0.07   | ng/g  | 69-135       | 3C      | 69-135      | 30     | 30            |                    |
| Perfluoroundecane sulfonic Acid (PFUSa)                                | 2309-99-8 | L  | 0.2045 | ng/g  | 86-139       | 3C      | 86-139      | 30     | 30            |                    |
| Perfluorooctadecane sulfonic Acid (PFOSa)                              | 376-86-7  | L  | 0.054  | ng/g  | 69-133       | 3C      | 69-133      | 30     | 30            |                    |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 60-757             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 65-162             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 70-151             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 80-238             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 81-147             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 82-789             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 83-766             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 84-132             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 85-162             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 86-154             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 87-181             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 88-130             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 89-106             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 90-127             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 91-138             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 92-158             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 93-174             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 94-236             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 95-140             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 96-160             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 97-193             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 98-150             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 99-135             |
| Perfluoro 1,3,5-trimethylbenzene (MTBBz)                               | ACME      |    |        |       |              |         |             |        |               | 100-130            |

Please Note that the RL information provided in this table is calculated using a 100% Sulfur Factor. (Soil/Solids only)  
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PFAAs via LCHMS-Isotope Dilution (TTSUE)

Holding Time: 28 days  
Container/Sample Preservation: 1 Plastic 800 unpreserved

| Analyte   | CAS #          | RL | MDL | Units | LCS<br>Criteria | LCS RPD | MS<br>Criteria | MS RPD | Duplicate<br>RPD | Surrogate<br>Criteria |
|---|----------------|----|-----|-------|-----------------|---------|----------------|--------|------------------|-----------------------|
| Perfluoro-2,3,4,6-tetracarboxylic Acid (PF297M)                       | None           |    |     |       |                 |         |                |        |                  | 61-747                |
| Perfluoro-2,3,4,7-tetracarboxylic Acid (PF297M)                       | None           |    |     |       |                 |         |                |        |                  | 62-789                |
| Perfluoro-1,1,1,1-tetrafluoro-2,3,4,6-tetracarboxylic Acid (PF297M)   | None           |    |     |       |                 |         |                |        |                  | 63-766                |
| Perfluoro-1,1,1,1-tetrafluoro-2,3,4,7-tetracarboxylic Acid (PF297M)   | None           |    |     |       |                 |         |                |        |                  | 63-783                |
| 1H,1H,2H,2H-Perfluoro-1,2,3,4-tetrahydrophthalic Acid (PF)            | None           |    |     |       |                 |         |                |        |                  | 72-787                |
| Perfluoro-1,1,1,1-tetrafluoro-2,3,4,7-tetracarboxylic Acid (PF297M)   | None           |    |     |       |                 |         |                |        |                  | 64-754                |
| Perfluoro-1,1,1,1-tetrafluoro-2,3,4,6-tetracarboxylic Acid (PF297M)   | None           |    |     |       |                 |         |                |        |                  | 65-751                |
| Perfluoro-1,1,1,1-tetrafluoro-2,3,4,7-tetracarboxylic Acid (PF297M)   | None           |    |     |       |                 |         |                |        |                  | 65-740                |
| 1H,1H,2H,2H-Perfluoro-1,2,3,4-tetrahydrophthalic Acid (PF)            | None           |    |     |       |                 |         |                |        |                  | 25-788                |
| Di-carboxy-perfluoro-1-octanecarboxylic Acid                          | None           |    |     |       |                 |         |                |        |                  | 16-777                |
| Perfluoro-1,1,1,1-tetrafluoro-2,3,4,6-tetracarboxylic Acid (PF297M)   | None           |    |     |       |                 |         |                |        |                  | 64-758                |
| Perfluoro-1,1,1,1-tetrafluoro-2,3,4,7-tetracarboxylic Acid (PF297M)   | None           |    |     |       |                 |         |                |        |                  | 7-773                 |
| Perfluoro-1,1,1,1-tetrafluoro-2,3,4,6-tetracarboxylic Acid (PF297M)   | None           |    |     |       |                 |         |                |        |                  | 64-756                |
| Perfluoro-1,1,1,1-tetrafluoro-2,3,4,7-tetracarboxylic Acid (PF297M)   | None           |    |     |       |                 |         |                |        |                  | 56-748                |
| Perfluoro-1,1,1,1-tetrafluoro-2,3,4,6-tetracarboxylic Acid (PF297M)   | None           |    |     |       |                 |         |                |        |                  | 76-767                |
| 2,2,3,3-Tetrafluoro-1,1,1,2,3,3,3-heptafluoropropanoic Acid           | None           |    |     |       |                 |         |                |        |                  | 36-750                |
| Perfluoro-1,1,1,1-tetrafluoro-2,3,4,6-tetracarboxylic Acid (PF297M)   | None           |    |     |       |                 |         |                |        |                  | 50-730                |
| N-methyl-N-perfluoro-1-octanecarboxamide (PF-NMOC)                    | None           |    |     |       |                 |         |                |        |                  | 40-740                |
| 2,2,3,3-Tetrafluoro-1,1,1,2,3,3,3-heptafluoropropanoic Acid (PF-NMOC) | None           |    |     |       |                 |         |                |        |                  | 33-730                |
| 2,2,3,3-Tetrafluoro-1,1,1,2,3,3,3-heptafluoropropanoic Acid (PF-NMOC) | 1,197,975-99-8 |    |     |       |                 |         |                |        |                  | 50-733                |
| 2,2,3,3-Tetrafluoro-1,1,1,2,3,3,3-heptafluoropropanoic Acid (PF-NMOC) | None           |    |     |       |                 |         |                |        |                  | 30-730                |

Please Note that the RL information provided in this table is calculated using a 100% Spike Factor. (Spike/Solids only)  
Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc



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## Alpha SPE-LC/MS/MS Isotope Dilution Method

EPA Methods 537.1 and 533 are limited to clean water applications primarily. For all other cases, where non-potable water, soils or tissues need to be analyzed, another analytical method will need to be utilized. This is also the case when there are additional, specific PFAS compounds that need to be included that are not on either method's target compound list. EPA did release SW-846 Method 8327 in 2019. While this method was intended for non-potable water, it does not address solid matrices. Anecdotally, this method was not well received in the environmental laboratory community. It specifies direct aqueous injection rather than solid phase extraction (SPE), and the analyte quantification procedure is based on an external rather internal calibration approach that does not incorporate isotopic dilution. The DoD considers Method 8327 a "screening method" (Alyssa G. Wingard, Senior Chemist, NAVSEA 04X6 Laboratory Quality and Accreditation Office (LQAO); July 2019, email correspondence, DENIX).

Given the lack of standardized, published analytical methods for non-drinking water sample media, and the fact that EPA 500 series methods are not allowed to be modified in this way, Alpha Analytical has developed its own procedure. This Alpha method is also a liquid chromatography tandem mass spectrometry method (LC/MS/MS) with solid phase extraction and it is most similar to Method 533 in that it utilizes the weak anion exchange (WAX) SPE cartridge and the method calibration employs the isotope dilution technique. This method incorporates the maximum number of commercially available extracted internal standards, consisting of (18) <sup>13</sup>C -enriched and (2) <sup>2</sup>H-enriched compounds. As more of these reference standards become available, they will be incorporated into our method as well. We can analyze for up to 36 PFAS compounds, or any subset, using this approach. We analyze a wide range of sample matrices in addition to aqueous samples including soils/sediments, biosolids, and tissues. Given our laboratory's extensive background supporting ecological risk assessments in general, we have considerable experience working with fish, shellfish, soils and sediments.

In practice, aqueous reporting limits are 2 ng/L and we have demonstrated reporting limits in the range of 1 ng/G for oyster samples from a past project. Some of the more difficult target analytes have poorer performance and higher reporting limits. Please see the attached compound lists and the associated standard RL/MDL information that is included with our quotation.

### Summary of Method

A 250-mL water sample is fortified with extracted internal standards (EIS) and passed through a solid phase extraction (WAX) cartridge containing a mixed mode, Weak Anion Exchange, reversed phase, water-wettable polymer to extract the method analytes and isotopically-labeled compounds. The compounds are eluted from the solid phase in two fractions. An injection is made into an LC equipped with a C18 column that is interfaced to an MS/MS. The analytes are separated and identified by comparing the acquired mass spectra and retention times to reference spectra and retention times for calibration standards acquired under



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identical LC/MS/MS conditions. The concentration of each analyte is determined by using the isotope dilution technique. Extracted Internal Standards (EIS) analytes are used to monitor the extraction efficiency of the method analytes.

#### **Initial Calibration Verification (ICV)**

As part of the IDC and after each ICAL, analyze a QCS sample from a source different from the source of the CAL standards. If a second vendor is not available, then a different lot of the standard should be used. The QCS should be prepared and analyzed just like a CCV. Acceptance criteria for the QCS are identical to the CCVs; the calculated amount for each analyte must be  $\pm 30\%$  of the expected value. If measured analyte concentrations are not of acceptable accuracy, check the entire analytical procedure to locate and correct the problem

#### **Continuing Calibration Verification (CCV)**

CCV Standards are analyzed at the beginning of each analysis batch, after every 10 Field Samples, and at the end of the analysis batch. See Section 10.7 for concentration requirements and acceptance criteria.

**Initial Calibration** - Demonstration and documentation of acceptable initial calibration is required before any samples are analyzed. After the initial calibration is successful, a CCV is required at the beginning and end of each period in which analyses are performed, and after every tenth Field Sample.

Establish LC operating parameters that optimize resolution and peak shape. Modifying the standard or extract composition to more aqueous content to prevent poor shape is not permitted.

Inject a mid-level CAL standard under LC/MS conditions to obtain the retention times of each method analyte.

Inject a mid-level CAL standard under optimized LC/MS/MS conditions to ensure that each method analyte is observed in its MS/MS window and that there are at least 10 scans across the peak for optimum precision.

CAL standards are prepared according to SOP. The lowest concentration CAL standard must be at or below the RL (2 ng/L), which may depend on system sensitivity.

The LC/MS/MS system is calibrated using the IS technique. Use the LC/MS/MS data system software to generate a linear regression or quadratic calibration curve for each of the analytes. This curve must always be forced through zero and may be concentration weighted, if necessary. Forcing zero allows for a better estimate of the background levels of method analytes. A minimum of 5 levels are required for a linear calibration model and a minimum of 6 levels are required for a quadratic calibration model.



**CALIBRATION ACCEPTANCE CRITERIA** – A linear fit is acceptable if the coefficient of determination ( $r^2$ ) is greater than 0.99. When quantitated using the initial calibration curve, each calibration point, except the lowest point, for each analyte should calculate to be within 70-130% of its true value. The lowest CAL point should calculate to be within 50-150% of its true value. If these criteria cannot be met, the analyst will have difficulty meeting ongoing QC criteria. It is recommended that corrective action is taken to reanalyze the CAL standards, restrict the range of calibration, or select an alternate method of calibration (forcing the curve through zero is still required).

**CONTINUING CALIBRATION CHECK (CCV)** – Minimum daily calibration verification is as follows. Verify the initial calibration at the beginning and end of each group of analyses, and after every tenth sample during analyses. In this context, a “sample” is considered to be a Field Sample. MBs, CCVs, LCSs, MSs, FDs FRBs and MSDs are not counted as samples. The beginning CCV of each analysis batch must be at or below the RL in order to verify instrument sensitivity prior to any analyses. If standards have been prepared such that all low CAL points are not in the same CAL solution, it may be necessary to analyze two CAL standards to meet this requirement. Alternatively, the analyte concentrations in the analyte PDS may be customized to meet these criteria. Subsequent CCVs should alternate between a medium and Low concentration CAL standard.

**REMEDIAL ACTION** – Failure to meet CCV QC performance criteria may require remedial action. Major maintenance, such as cleaning the electrospray probe, atmospheric pressure ionization source, cleaning the mass analyzer, replacing the LC column, etc., requires recalibration (Sect 10.6) and verification of sensitivity by analyzing a CCV at or below the RL (Sect 10.7).

### **PFAS Tissue Prep Summary**

#### **Sample Prep and Extraction Protocol for Tissues, Oils and Biosolids, Methanol Extraction**

Homogenize and weigh sample (measured to the nearest hundredth of a gram) into a 50 ml polypropylene centrifuge tube. For laboratory control blanks and spikes, clean sand is used. Add EIS PDS to each sample.

If the sample is an LCS, LCSD, MS, or MSD, add the necessary amount of analyte PDS. Cap and invert each sample to mix. Samples vortexed, sonicated and centrifuged.

#### **Extract Clean-up: Tissues, Oils and Biosolids**

**CARTRIDGE CLEAN-UP AND CONDITIONING** – WAX cartridge and GCB cartridges. Sequential rinses. Attach the sample transfer tubes, turn on the vacuum.

#### **SAMPLE elution AND CARTRIDGE RINSE**

#### **Extract Concentration**

Concentrate the extract to dryness under a gentle stream of nitrogen in a heated water bath. Vortex



## **APPENDIX 5: RISK CALCULATION SPREADSHEETS**

## Site-specific Recreator Equation Inputs for Surface Water

\* Inputted values different from Recreator defaults are highlighted.

| Variable   | Recreator Surface Water Default Value | Form-input Value |
|--|---------------------------------------|------------------|
| BW <sub>...</sub> (body weight) kg   | 15                                    | 15               |
| BW <sub>...</sub> (body weight) kg   | 15                                    | 15               |
| BW <sub>...</sub> (body weight) kg   | 80                                    | 80               |
| BW <sub>...</sub> (body weight) kg   | 80                                    | 80               |
| BW <sub>...</sub> (body weight - adult) kg   | 80                                    | 80               |
| BW <sub>...</sub> (body weight - adult) kg   | 80                                    | 80               |
| DFW <sub>...</sub> (age-adjusted dermal factor) cm <sup>2</sup> -event/kg            | .                                     | 581802           |
| DFWM <sub>...</sub> (mutagenic age-adjusted dermal factor) cm <sup>2</sup> -event/kg | .                                     | 1825564          |
| ED <sub>...</sub> (exposure duration - recreator) years                              | 26                                    | 26               |
| ED <sub>...</sub> (exposure duration) years  | 2                                     | 2                |
| ED <sub>...</sub> (exposure duration) years  | 4                                     | 4                |
| ED <sub>...</sub> (exposure duration) years  | 10                                    | 10               |
| ED <sub>...</sub> (exposure duration) years  | 10                                    | 10               |
| ED <sub>...</sub> (exposure duration - adult) years                                  | 20                                    | 20               |
| EF <sub>...</sub> (exposure frequency) days/year                                     | .                                     | 78               |
| EF <sub>...</sub> (exposure frequency) days/year                                     | .                                     | 78               |
| EF <sub>...</sub> (exposure frequency) days/year                                     | .                                     | 78               |
| EF <sub>...</sub> (exposure frequency) days/year                                     | .                                     | 78               |
| EF <sub>...</sub> (adult exposure frequency) days/year                               | .                                     | 78               |
| ET <sub>...</sub> (exposure time) hours/event  | .                                     | 2                |
| ET <sub>...</sub> (exposure time) hours/event  | .                                     | 2                |
| ET <sub>...</sub> (exposure time) hours/event  | .                                     | 2                |
| ET <sub>...</sub> (exposure time) hours/event  | .                                     | 2                |
| ET <sub>...</sub> (adult exposure time) hours/event                                  | .                                     | 2                |
| EV <sub>...</sub> (events) events/day  | .                                     | 1                |
| EV <sub>...</sub> (events) events/day  | .                                     | 1                |
| EV <sub>...</sub> (events) events/day  | .                                     | 1                |
| EV <sub>...</sub> (events) events/day  | .                                     | 1                |
| EV <sub>...</sub> (adult) events/day   | .                                     | 1                |

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78 Day Recreator

## Site-specific Recreator Equation Inputs for Surface Water

\* Inputted values different from Recreator defaults are highlighted.

| Variable  | Recreator Surface Water Default Value | Form-input Value |
|---|---------------------------------------|------------------|
| THQ (target hazard quotient) unitless                               | 0.1                                   | 1                |
| IFW <sub>...</sub> (age-adjusted water intake rate) L/kg            | .                                     | 11.778           |
| IFWM <sub>...</sub> (mutagenic age-adjusted water intake rate) L/kg | .                                     | 89.111           |
| IRW <sub>...</sub> (water intake rate) L/hour                       | 0.12                                  | 0.12             |
| IRW <sub>...</sub> (water intake rate) L/hour                       | 0.12                                  | 0.12             |
| IRW <sub>...</sub> (water intake rate) L/hour                       | 0.124                                 | 0.124            |
| IRW <sub>...</sub> (water intake rate) L/hour                       | 0.0985                                | 0.0985           |
| IRW <sub>...</sub> (water intake rate - adult) L/day                | 0.11                                  | 0.11             |
| IRW <sub>...</sub> (water intake rate - adult) L/hr                 | 0.11                                  | 0.11             |
| LT (lifetime - recreator) years                                     | 70                                    | 70               |
| SA <sub>...</sub> (skin surface area) cm <sup>2</sup>               | 6365                                  | 6365             |
| SA <sub>...</sub> (skin surface area) cm <sup>2</sup>               | 6365                                  | 6365             |
| SA <sub>...</sub> (skin surface area) cm <sup>2</sup>               | 19652                                 | 19652            |
| SA <sub>...</sub> (skin surface area) cm <sup>2</sup>               | 19652                                 | 19652            |
| SA <sub>...</sub> (skin surface area - adult) cm <sup>2</sup>       | 19652                                 | 19652            |
| SA <sub>...</sub> (skin surface area - adult) cm <sup>2</sup>       | 19652                                 | 19652            |
| Apparent thickness of stratum corneum (cm)                          | 0.001                                 | 0.001            |
| TR (target risk) unitless   | 1.0E-06                               | 1.0E-05          |

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Site-specific

3

Recreator Regional Screening Levels (RSL) for Surface Water

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; \* = where: nc SL < 100X ca SL; \*\* = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

| Chemical                             | CAS Number | Mutagen? | Volatile? | Chemical Type | Chemical Type | SF (mg/kg-day) | SF Ref | RfD (mg/kg-day) | RfD Ref | RfC (mg/m <sup>3</sup> ) | RfC Ref | RAGS GIABS (unitless) | K <sub>1</sub> (cm/hr) | MW     | FA (unitless) | In EPD? |
|--------------------------------------|------------|----------|-----------|---------------|---------------|----------------|--------|-----------------|---------|--------------------------|---------|-----------------------|------------------------|--------|---------------|---------|
| Perfluorooctane sulfonic acid (PFOS) | 1763-23-1  | No       | No        | Organics      | Organics      | -              | -      | 2.00E-05        | U       | -                        | -       | 1                     | -                      | 500.13 | -             | -       |
| Perfluorooctanoic acid (PFOA)        | 335-67-1   | No       | No        | Organics      | Organics      | 7.00E-02       | U      | 2.00E-05        | U       | -                        | -       | 1                     | -                      | 414.07 | -             | -       |

| DA <sub>100mi</sub> | DA <sub>100mi</sub> | DA <sub>100mi</sub> | Ingestion SL TR=1E-05 (ug/L) | Dermal SL TR=1E-05 (ug/L) | Carcinogenic SL TR=1E-05 (ug/L) | Ingestion SL (Child) THQ=1 (ug/L) | Dermal SL (Child) THQ=1 (ug/L) | Noncarcinogenic SL (Child) THQ=1 (ug/L) | Ingestion SL (Adult) THQ=1 (ug/L) | Dermal SL (Adult) THQ=1 (ug/L) | Noncarcinogenic SL (Adult) THQ=1 (ug/L) | Screening Level (ug/L) |
|---------------------|---------------------|---------------------|------------------------------|---------------------------|---------------------------------|-----------------------------------|--------------------------------|---|-----------------------------------|--------------------------------|---|------------------------|
| -                   | -                   | -                   | -                            | -                         | -                               | 5.85E+00                          | -                              | 5.85E+00                                | 3.40E+01                          | -                              | 3.40E+01                                | 5.85E+00<br>nc         |
| -                   | -                   | -                   | 3.10E+02                     | -                         | 3.10E+02                        | 5.85E+00                          | -                              | 5.85E+00                                | 3.40E+01                          | -                              | 3.40E+01                                | 5.85E+00<br>nc         |

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Site-specific Recreator Equation Inputs for Surface Water

1

\* Inpited values different from Recreator defaults are highlighted.

| Variable   | Recreator Surface Water Default Value | Form-input Value |
|--|---------------------------------------|------------------|
| BW <sub>100mi</sub> (body weight) kg   | 15                                    | 15               |
| BW <sub>100mi</sub> (body weight) kg   | 15                                    | 15               |
| BW <sub>100mi</sub> (body weight) kg   | 80                                    | 80               |
| BW <sub>100mi</sub> (body weight) kg   | 80                                    | 80               |
| BW <sub>100mi</sub> (body weight - adult) kg   | 80                                    | 80               |
| BW <sub>100mi</sub> (body weight - adult) kg   | 80                                    | 80               |
| DFW <sub>100mi</sub> (age-adjusted dermal factor) cm <sup>2</sup> -event/kg            | .                                     | 193934           |
| DFWM <sub>100mi</sub> (mutagenic age-adjusted dermal factor) cm <sup>2</sup> -event/kg | .                                     | 608521.333       |
| ED <sub>100mi</sub> (exposure duration - recreator) years                              | 26                                    | 26               |
| ED <sub>100mi</sub> (exposure duration) years  | 2                                     | 2                |
| ED <sub>100mi</sub> (exposure duration) years  | 4                                     | 4                |
| ED <sub>100mi</sub> (exposure duration) years  | 10                                    | 10               |
| ED <sub>100mi</sub> (exposure duration) years  | 10                                    | 10               |
| ED <sub>100mi</sub> (exposure duration - adult) years                                  | 20                                    | 20               |
| EF <sub>100mi</sub> (exposure frequency) days/year                                     | .                                     | 26               |
| EF <sub>100mi</sub> (exposure frequency) days/year                                     | .                                     | 26               |
| EF <sub>100mi</sub> (exposure frequency) days/year                                     | .                                     | 26               |
| EF <sub>100mi</sub> (exposure frequency) days/year                                     | .                                     | 26               |
| EF <sub>100mi</sub> (adult exposure frequency) days/year                               | .                                     | 26               |
| ET <sub>100mi</sub> (exposure time) hours/event  | .                                     | 2                |
| ET <sub>100mi</sub> (exposure time) hours/event  | .                                     | 2                |
| ET <sub>100mi</sub> (exposure time) hours/event  | .                                     | 2                |
| ET <sub>100mi</sub> (exposure time) hours/event  | .                                     | 2                |
| ET <sub>100mi</sub> (adult exposure time) hours/event                                  | .                                     | 2                |
| EV <sub>100mi</sub> (events) events/day  | .                                     | 1                |
| EV <sub>100mi</sub> (events) events/day  | .                                     | 1                |
| EV <sub>100mi</sub> (events) events/day  | .                                     | 1                |
| EV <sub>100mi</sub> (events) events/day  | .                                     | 1                |
| EV <sub>100mi</sub> (adult) events/day   | .                                     | 1                |

Output generated 19JUL2020:08:25:27

26 Day yr. Recreator



## Site-specific Recreator Equation Inputs for Surface Water

2

\* Inputted values different from Recreator defaults are highlighted.

| Variable  | Recreator Surface Water Default Value | Form-input Value |
|---|---------------------------------------|------------------|
| THQ (target hazard quotient) unitless                                   | 0.1                                   | 1                |
| IFW <sub>age-adj</sub> (age-adjusted water intake rate) L/kg            | .                                     | 3.926            |
| IFWM <sub>age-adj</sub> (mutagenic age-adjusted water intake rate) L/kg | .                                     | 16.37            |
| IRW <sub>1</sub> (water intake rate) L/hour                             | 0.12                                  | 0.12             |
| IRW <sub>2</sub> (water intake rate) L/hour                             | 0.12                                  | 0.12             |
| IRW <sub>3</sub> (water intake rate) L/hour                             | 0.124                                 | 0.124            |
| IRW <sub>4</sub> (water intake rate) L/hour                             | 0.0985                                | 0.0985           |
| IRW <sub>5</sub> (water intake rate - adult) L/day                      | 0.11                                  | 0.11             |
| IRW <sub>6</sub> (water intake rate - adult) L/hr                       | 0.11                                  | 0.11             |
| LT (lifetime - recreator) years   | 70                                    | 70               |
| SA <sub>1</sub> (skin surface area) cm <sup>2</sup>                     | 6365                                  | 6365             |
| SA <sub>2</sub> (skin surface area) cm <sup>2</sup>                     | 6365                                  | 6365             |
| SA <sub>3</sub> (skin surface area) cm <sup>2</sup>                     | 19652                                 | 19652            |
| SA <sub>4</sub> (skin surface area) cm <sup>2</sup>                     | 19652                                 | 19652            |
| SA <sub>5</sub> (skin surface area - adult) cm <sup>2</sup>             | 19652                                 | 19652            |
| SA <sub>6</sub> (skin surface area - adult) cm <sup>2</sup>             | 19652                                 | 19652            |
| Apparent thickness of stratum corneum (cm)                              | 0.001                                 | 0.001            |
| TR (target risk) unitless   | 1.0E-06                               | 1.0E-05          |

Output generated 19JUL2020:08:25:27

## Site-specific Recreator Regional Screening Levels (RSL) for Surface Water

3

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; \* = where: nc SL < 100X ca SL; \*\* = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

| Chemical                             | CAS Number | Mutagen? | Volatile? | Chemical Type | Chemical Type | SF <sub>1</sub> (mg/kg-day) | SF <sub>2</sub> Ref | RfD (mg/kg-day) | RfD Ref | RfC (mg/m <sup>3</sup> ) | RfC Ref | RAGSe | GIABS | K <sub>1</sub> (cm/hr) | MW | FA (unitless) | In EPD? |
|--------------------------------------|------------|----------|-----------|---------------|---------------|-----------------------------|---------------------|-----------------|---------|--------------------------|---------|-------|-------|------------------------|----|---------------|---------|
| Perfluorooctane sulfonic acid (PFOS) | 1763-23-1  | No       | No        | Organics      | Organics      | -                           | -                   | 2.00E-05        | D       | -                        | -       | 1     | -     | 500.13                 | 0  | No            |         |
| Perfluorooctanoic acid (PFOA)        | 335-67-1   | No       | No        | Organics      | Organics      | 7.00E-02                    | D                   | 2.00E-05        | D       | -                        | -       | 1     | -     | 414.07                 | 0  | No            |         |

| DA <sub>100</sub> | DA <sub>1000</sub> | DA <sub>10000</sub> | Ingestion SL TR=1E-05 (ug/L) | Dermal SL TR=1E-05 (ug/L) | Carcinogenic SL TR=1E-05 (ug/L) | Ingestion SL (Child) THQ=1 (ug/L) | Dermal SL (Child) THQ=1 (ug/L) | Noncarcinogenic SL (Child) THQ=1 (ug/L) | Ingestion SL (Adult) THQ=1 (ug/L) | Dermal SL (Adult) THQ=1 (ug/L) | Noncarcinogenic SL (Adult) THQ=1 (ug/L) | Screening Level (ug/L) |
|-------------------|--------------------|---------------------|------------------------------|---------------------------|---------------------------------|-----------------------------------|--------------------------------|---|-----------------------------------|--------------------------------|---|------------------------|
| -                 | -                  | -                   | -                            | -                         | -                               | 1.75E+01                          | -                              | 1.75E+01                                | 1.02E+02                          | -                              | 1.02E+02                                | 1.75E+01<br>nc         |
| -                 | -                  | -                   | 9.30E+02                     | -                         | 9.30E+02                        | 1.75E+01                          | -                              | 1.75E+01                                | 1.02E+02                          | -                              | 1.02E+02                                | 1.75E+01<br>nc         |

Output generated 19JUL2020:08:25:27

6214 mg/day Oyster

## Site-specific Equation Inputs for Fish

\* Inputted values different from defaults are highlighted.

| Variable                                       | Fish Default Value | Form-Input Value |
|--|--------------------|------------------|
| AT (averaging time)                            | 365                | 365              |
| BW... (body weight) kg                         | 80                 | 80               |
| ED... (exposure duration) yr                   | 26                 | 26               |
| EF... (exposure frequency) days/yr             | 350                | 350              |
| THQ (target hazard quotient) unitless          | 0.1                | 1                |
| IRF1... (fish consumption rate - adult) mg/day | 70                 | 6214             |
| LT (lifetime) yr                               | 70                 | 70               |
| TR (target cancer risk) unitless               | 1.0E-06            | 1.0E-05          |

Output generated 19JUL2020:09:03:58

## Site-specific Regional Screening Levels (RSL) for Fish

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; \* = where: nc SL < 100X ca SL; \*\* = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

| Chemical                             | CAS Number | Mutagen? | Volatile? | Chemical Type | SF <sub>2</sub> (mg/kg-day) | SF <sub>Ref</sub> (mg/kg-day) | RfD (mg/kg-day) | RfD <sub>Ref</sub> (mg/kg) | Ingestion           | Ingestion        | Screening Level (mg/kg) |
|--------------------------------------|------------|----------|-----------|---------------|-----------------------------|-------------------------------|-----------------|----------------------------|---------------------|------------------|-------------------------|
|                                      |            |          |           |               |                             |                               |                 |                            | SL TR=1E-05 (mg/kg) | SL THQ=1 (mg/kg) |                         |
| Perfluorooctane sulfonic acid (PFOS) | 1763-23-1  | No       | No        | Organics      | -                           |                               | 2.00E-05        | U                          | -                   | 2.69E-01         | 2.69E-01 nc             |
| Perfluorooctanoic acid (PFOA)        | 335-67-1   | No       | No        | Organics      | 7.00E-02                    | U                             | 2.00E-05        | U                          | 5.16E+00            | 2.69E-01         | 2.69E-01 nc             |

Output generated 19JUL2020:09:03:58

## Site-specific Equation Inputs for Fish

\* Inputted values different from defaults are highlighted.

| Variable   | Fish Default Value | Form-input Value |
|--|--------------------|------------------|
| AT (averaging time)  | 365                | 365              |
| BW <sub>...</sub> (body weight) kg                         | 80                 | 80               |
| ED <sub>...</sub> (exposure duration) yr                   | 26                 | 26               |
| EF <sub>...</sub> (exposure frequency) days/yr             | 350                | 350              |
| THQ (target hazard quotient) unitless                      | 0.1                | 1                |
| IRFI <sub>...</sub> (fish consumption rate - adult) mg/day |                    | 4658             |
| LT (lifetime) yr   | 70                 | 70               |
| TR (target cancer risk) unitless                           | 1.0E-06            | 1.0E-05          |

Output generated: 19JUL2020:09:02:22

4658 mg/day Oyster

## Site-specific Regional Screening Levels (RSL) for Fish

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = user's guide; U = user provided; ca = cancer; nc = noncancer; \* = where: nc SL < 100X ca SL; \*\* = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

| Chemical                             | CAS Number | Mutagen? | Volatile? | Chemical Type | SF (mg/kg-day) <sup>-1</sup> | SF Ref (mg/kg-day) | RfD (mg/kg-day) | RfD Ref (mg/kg) | Ingestion SL | Ingestion SL | Screening Level (mg/kg) |
|--------------------------------------|------------|----------|-----------|---------------|------------------------------|--------------------|-----------------|-----------------|--------------|--------------|-------------------------|
|                                      |            |          |           |               |                              |                    |                 |                 | TR=1E-05     | THQ=1        |                         |
| Perfluorooctane sulfonic acid (PFOS) | 1763-23-1  | No       | No        | Organics      | -                            |                    | 2.00E-05        | U               | -            | 3.58E-01     | 3.58E-01 nc             |
| Perfluorooctanoic acid (PFOA)        | 335-67-1   | No       | No        | Organics      | 7.00E-02                     | U                  | 2.00E-05        | U               | 6.89E+00     | 3.58E-01     | 3.58E-01 nc             |

Output generated: 19JUL2020:09:02:22

## Site-specific Equation Inputs for Fish

\* Inputted values different from defaults are highlighted.

| Variable  | Fish Default Value | Form-input Value |
|---|--------------------|------------------|
| AT (averaging time)                                       | 365                | 365              |
| BW <sub>...</sub> (body weight) kg                        | 80                 | 80               |
| ED <sub>...</sub> (exposure duration) yr                  | 26                 | 26               |
| EF <sub>...</sub> (exposure frequency) days/yr            | 350                | 350              |
| THQ (target hazard quotient) unitless                     | 0.1                | 1                |
| IRF <sub>...</sub> (fish consumption rate - adult) mg/day |                    | 1244             |
| LT (lifetime) yr  | 70                 | 70               |
| TR (target cancer risk) unitless                          | 1.0E-06            | 1.0E-05          |

Output generated 19JUL2020:08:59:31

1244 mg/day Oyster

## Site-specific Regional Screening Levels (RSL) for Fish

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; \* = where: nc SL < 100X ca SL; \*\* = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

| Chemical                             | CAS Number | Mutagen? | Volatile? | Chemical Type | SF <sub>...</sub> (mg/kg-day) <sup>-1</sup> | SF <sub>Ref</sub> (mg/kg-day) | RfD (mg/kg) | RfD Ref (mg/kg) | Ingestion SL TR=1E-05 (mg/kg) | Ingestion SL THQ=1 (mg/kg) | Screening Level (mg/kg) |
|--------------------------------------|------------|----------|-----------|---------------|---|-------------------------------|-------------|-----------------|-------------------------------|----------------------------|-------------------------|
| Perfluorooctane sulfonic acid (PFOS) | 1763-23-1  | No       | No        | Organics      | -   |                               | 2.00E-05    | U               | -                             | 1.34E+00                   | 1.34E+00 nc             |
| Perfluorooctanoic acid (PFOA)        | 335-67-1   | No       | No        | Organics      | 7.00E-02                                    | U                             | 2.00E-05    | U               | 2.58E+01                      | 1.34E+00                   | 1.34E+00 nc             |

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## Site-specific Equation Inputs for Fish

\* Inputted values different from defaults are highlighted.

| Variable  | Fish Default Value | Form-input Value |
|---|--------------------|------------------|
| AT (averaging time)                                       | 365                | 365              |
| BW <sub>...</sub> (body weight) kg                        | 80                 | 80               |
| ED <sub>...</sub> (exposure duration) yr                  | 26                 | 26               |
| EF <sub>...</sub> (exposure frequency) days/yr            | 350                | 350              |
| THQ (target hazard quotient) unitless                     | 0.1                | 1                |
| IRF <sub>...</sub> (fish consumption rate - adult) mg/day | 70                 | 932              |
| LT (lifetime) yr  | 70                 | 70               |
| TR (target cancer risk) unitless                          | 1.0E-06            | 1.0E-05          |

Output generated 19JUL2020:08:57:42

932 mg/day Oyster

## Site-specific Regional Screening Levels (RSL) for Fish

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; \* = where: nc SL < 100X ca SL; \*\* = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

| Chemical                             | CAS Number | Mutagen? | Volatile? | Chemical Type | SF (mg/kg-day) <sup>1</sup> | SF Ref (mg/kg-day) | RfD (mg/kg-day) | RfD Ref (mg/kg) | Ingestion           |                  | Screening Level (mg/kg) |
|--------------------------------------|------------|----------|-----------|---------------|-----------------------------|--------------------|-----------------|-----------------|---------------------|------------------|-------------------------|
|                                      |            |          |           |               |                             |                    |                 |                 | TR=1E-05 SL (mg/kg) | THQ=1 SL (mg/kg) |                         |
| Perfluorooctane sulfonic acid (PFOS) | 1763-23-1  | No       | No        | Organics      | -                           | -                  | 2.00E-05        | U               | -                   | 1.79E+00         | 1.79E+00 nc             |
| Perfluorooctanoic acid (PFOA)        | 335-67-1   | No       | No        | Organics      | 7.00E-02                    | U                  | 2.00E-05        | U               | 3.44E+01            | 1.79E+00         | 1.79E+00 nc             |

Output generated 19JUL2020:08:57:42

### Site-specific Equation Inputs for Fish

\* Inputted values different from defaults are highlighted.

| Variable                                       | Fish Default Value | Form-input Value |
|--|--------------------|------------------|
| AT (averaging time)                            | 365                | 365              |
| BW... (body weight) kg                         | 80                 | 40               |
| ED... (exposure duration) yr                   | 26                 | 26               |
| EF... (exposure frequency) days/yr             | 350                | 350              |
| THQ (target hazard quotient) unitless          | 0.1                | 1                |
| IRF1... (fish consumption rate - adult) mg/day |                    | 6214             |
| LT (lifetime) yr                               | 70                 | 70               |
| TR (target cancer risk) unitless               | 1.0E-06            | 1.0E-05          |

Output generated 19JUL2020:09:14:31

6214 mg/day youth Oyster

### Site-specific Regional Screening Levels (RSL) for Fish

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; \* = where: nc SL < 100X ca SL; \*\* = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

| Chemical                             | CAS Number | Mutagen? | Volatile? | Chemical Type | SF (mg/kg-day) <sup>1</sup> | SF Ref | RfD (mg/kg-day) | RfD Ref | Ingestion SL     |               | Screening Level (mg/kg) |
|--------------------------------------|------------|----------|-----------|---------------|-----------------------------|--------|-----------------|---------|------------------|---------------|-------------------------|
|                                      |            |          |           |               |                             |        |                 |         | TR=1E-05 (mg/kg) | THQ=1 (mg/kg) |                         |
| Perfluorooctane sulfonic acid (PFOS) | 1763-23-1  | No       | No        | Organics      | -                           |        | 2.00E-05        | U       | -                | 1.34E-01      | 1.34E-01 nc             |
| Perfluorooctanoic acid (PFOA)        | 335-67-1   | No       | No        | Organics      | 7.00E-02                    | U      | 2.00E-05        | U       | 2.58E+00         | 1.34E-01      | 1.34E-01 nc             |

Output generated 19JUL2020:09:14:31

## **APPENDIX 6: EXPOSURE EQUATIONS AND VARIABLES**

## Exposure Equations and Variables

### Noncarcinogenic - Child

The recreator surface water land use equation, presented here, contains the following exposure routes:

- incidental ingestion of water

$$SL_{rec-wat-nc-ing-c} (\mu g/L) = \frac{THQ \times AT_{rec-c} \left( \frac{365 \text{ days}}{\text{year}} \times ED_{rec-c} (6 \text{ years}) \right) \times BW_{rec-c} (15 \text{ kg}) \times \left( \frac{1000 \mu g}{\text{mg}} \right)}{EF_{rec-c} \left( \frac{\text{days}}{\text{year}} \right) \times ED_{rec-c} (6 \text{ years}) \times \frac{1}{RfD_o} \left( \frac{\text{mg}}{\text{kg-d}} \right) \times IRW_{rec-c} \left( \frac{0.12 \text{ L}}{\text{hour}} \right) \times EV_{rec-c} \left( \frac{\text{events}}{\text{day}} \right) \times ET_{event-rec-c} \left( \frac{\text{hours}}{\text{event}} \right)}$$

- dermal

FOR INORGANICS

$$SL_{rec-wat-nc-der-c} (\mu g/L) = \frac{DA_{event} \left( \frac{\mu g}{\text{cm}^2 \cdot \text{event}} \right) \times \left( \frac{1000 \text{ cm}^3}{\text{L}} \right)}{K_p \left( \frac{\text{cm}}{\text{hour}} \right) \times ET_{event-rec-c} \left( \frac{\text{hours}}{\text{event}} \right)}$$

FOR ORGANICS

$$\text{IF } ET_{event-rec-c} \left( \frac{\text{hours}}{\text{event}} \right) \leq t^* (\text{hour}), \text{ then } SL_{rec-wat-nc-der} (\mu g/L) = \frac{DA_{event} \left( \frac{\mu g}{\text{cm}^2 \cdot \text{event}} \right) \times \left( \frac{1000 \text{ cm}^3}{\text{L}} \right)}{2 \times FA \times K_p \left( \frac{\text{cm}}{\text{hour}} \right) \times \left[ 5 \times t_{event} \left( \frac{\text{hours}}{\text{event}} \right) \times ET_{event-rec-c} \left( \frac{\text{hours}}{\text{event}} \right) \right]}$$

or,

$$\text{IF } ET_{event-rec-c} \left( \frac{\text{hours}}{\text{event}} \right) > t^* (\text{hour}), \text{ then } SL_{rec-wat-nc-der} (\mu g/L) = \frac{DA_{event} \left( \frac{\mu g}{\text{cm}^2 \cdot \text{event}} \right) \times \left( \frac{1000 \text{ cm}^3}{\text{L}} \right)}{FA \times K_p \left( \frac{\text{cm}}{\text{hour}} \right) \times \left[ \frac{ET_{event-rec-c} \left( \frac{\text{hours}}{\text{event}} \right)}{t + B} + 2 \times t_{event} \left( \frac{\text{hours}}{\text{event}} \right) \times \left( \frac{1 + 3B + 3B^2}{(1 + B)^2} \right) \right]}$$

where

$$DA_{event} \left( \frac{\mu g}{\text{cm}^2 \cdot \text{event}} \right) = \frac{THQ \times AT_{rec-c} \left( \frac{365 \text{ days}}{\text{year}} \times ED_{rec-c} (6 \text{ years}) \right) \times \left( \frac{1000 \mu g}{\text{mg}} \right) \times BW_{rec-c} (15 \text{ kg})}{\left( \frac{t}{RfD_o} \left( \frac{\text{mg}}{\text{kg-day}} \right) \times GIABS \right) \times EV_{rec-c} \left( \frac{\text{events}}{\text{day}} \right) \times ED_{rec-c} (6 \text{ years}) \times EF_{rec-c} \left( \frac{\text{days}}{\text{year}} \right) \times SA_{rec-c} (6365 \text{ cm}^2)}$$

- Total

$$SL_{rec-wat-nc-tot-c} (\mu g/L) = \frac{1}{\frac{1}{SL_{rec-wat-nc-ing-c}} + \frac{1}{SL_{rec-wat-nc-der-c}}}$$

### Noncarcinogenic - Adult



The recreator surface water land use equation, presented here, contains the following exposure routes:

- incidental ingestion of water

$$SL_{\text{rec-wat-nc-ing-a}} (\mu\text{g/L}) = \frac{\text{THQ} \times \text{AT}_{\text{rec-a}} \left( \frac{365 \text{ days}}{\text{year}} \times \text{ED}_{\text{rec-a}} (20 \text{ years}) \right) \times \text{BW}_{\text{rec-a}} (80 \text{ kg}) \times \left( \frac{1000 \mu\text{g}}{\text{mg}} \right)}{\text{EF}_{\text{rec-a}} \left( \frac{\text{days}}{\text{year}} \right) \times \text{ED}_{\text{rec-a}} (20 \text{ years}) \times \frac{1}{\text{RID}_o \left( \frac{\text{mg}}{\text{kg-d}} \right)} \times \text{IRW}_{\text{rec-a}} \left( \frac{0.11 \text{ L}}{\text{hour}} \right) \times \text{EV}_{\text{rec-a}} \left( \frac{\text{events}}{\text{day}} \right) \times \text{ET}_{\text{event-rec-a}} \left( \frac{\text{hours}}{\text{event}} \right)}$$

- dermal

FOR INORGANICS

$$SL_{\text{rec-wat-nc-der-a}} (\mu\text{g/L}) = \frac{\text{DA}_{\text{event}} \left( \frac{\mu\text{g}}{\text{cm}^2 \cdot \text{event}} \right) \times \left( \frac{1000 \text{ cm}^3}{\text{L}} \right)}{K_p \left( \frac{\text{cm}}{\text{hour}} \right) \times \text{ET}_{\text{event-rec-a}} \left( \frac{\text{hours}}{\text{event}} \right)}$$

FOR ORGANICS

$$\text{IF } \text{ET}_{\text{event-rec-a}} \left( \frac{\text{hours}}{\text{event}} \right) \leq 1^* (\text{hour}) \text{ then } SL_{\text{rec-wat-nc-der}} (\mu\text{g/L}) = \frac{\text{DA}_{\text{event}} \left( \frac{\mu\text{g}}{\text{cm}^2 \cdot \text{event}} \right) \times \left( \frac{1000 \text{ cm}^3}{\text{L}} \right)}{2 \times \text{FA} \times K_p \left( \frac{\text{cm}}{\text{hour}} \right) \times \sqrt{\left[ \left( \frac{\text{hours}}{\text{event}} \right) \times \text{ET}_{\text{event-rec-a}} \left( \frac{\text{hours}}{\text{event}} \right) \right]}}$$

or,

$$\text{IF } \text{ET}_{\text{event-rec-a}} \left( \frac{\text{hours}}{\text{event}} \right) > 1^* (\text{hour}) \text{ then } SL_{\text{rec-wat-nc-der}} (\mu\text{g/L}) = \frac{\text{DA}_{\text{event}} \left( \frac{\mu\text{g}}{\text{cm}^2 \cdot \text{event}} \right) \times \left( \frac{1000 \text{ cm}^3}{\text{L}} \right)}{\text{FA} \times K_p \left( \frac{\text{cm}}{\text{hour}} \right) \times \left[ \frac{\text{ET}_{\text{event-rec-a}} \left( \frac{\text{hours}}{\text{event}} \right)}{1 + B} + 2 \times \sqrt{\left( \frac{\text{hours}}{\text{event}} \right) \times \left( \frac{1 + 3B + 3B^2}{(1 + B)^2} \right)} \right]}$$

where

$$\text{DA}_{\text{event}} \left( \frac{\mu\text{g}}{\text{cm}^2 \cdot \text{event}} \right) = \frac{\text{THQ} \times \text{AT}_{\text{rec-a}} \left( \frac{365 \text{ days}}{\text{year}} \times \text{ED}_{\text{rec-a}} (20 \text{ years}) \right) \times \left( \frac{1000 \mu\text{g}}{\text{mg}} \right) \times \text{BW}_{\text{rec-a}} (80 \text{ kg})}{\left( \frac{1}{\text{RID}_o \left( \frac{\text{mg}}{\text{kg-day}} \right) \times \text{GIABS}} \right) \times \text{EV}_{\text{rec-a}} \left( \frac{\text{events}}{\text{day}} \right) \times \text{ED}_{\text{rec-a}} (20 \text{ years}) \times \text{EF}_{\text{rec-a}} \left( \frac{\text{days}}{\text{year}} \right) \times \text{SA}_{\text{rec-a}} (19652 \text{ cm}^2)}$$

$$SL_{\text{rec-wat-nc-tot-a}} (\mu\text{g/L}) = \frac{1}{\frac{1}{SL_{\text{rec-wat-nc-ing-a}}} + \frac{1}{SL_{\text{rec-wat-nc-der-a}}}}$$

- Total

### Ingestion of Fish

The fish RSL represents the concentration, in the fish, that can be consumed. Note: the consumption rate for fish is not age adjusted for this land use.

*The ingestion of fish land use is not provided in the Generic Tables but RSLs can be created by using the Calculator.*

### Noncarcinogenic

The ingestion of fish equation, presented here, contains the following exposure route:

- consumption of fish.

$$SL_{\text{res-fish-con}} (\text{mg/kg}) = \frac{THQ_{\text{res-a}} \left( \frac{365 \text{ days}}{\text{year}} \right) \times ED_{\text{res}} (26 \text{ years}) \times BW_{\text{res-a}} (80 \text{ kg})}{EF_{\text{res-a}} \left( \frac{350 \text{ days}}{\text{year}} \right) \times ED_{\text{res}} (26 \text{ years}) \times \frac{1}{RID_{\text{a}}} \left( \frac{\text{mg}}{\text{kg-day}} \right) \times IRF_{\text{res-a}} \left( \frac{\text{mg}}{\text{day}} \right) \times \frac{10^6 \text{ kg}}{1 \text{ mg}}}$$

| <b>Recreator SLs</b>           |   |                      |                               |
|--------------------------------|---|----------------------|-------------------------------|
| SL <sub>rec-water-nc-ing</sub> | Recreator Surface Water Non-Carcinogenic Ingestion (µg/L) | Contaminant-specific | Determined in this calculator |
| SL <sub>rec-water-nc-der</sub> | Recreator Surface Water Non-Carcinogenic Dermal (µg/L)    | Contaminant-specific | Determined in this calculator |
| SL <sub>rec-water-nc-tot</sub> | Recreator Surface Water Non-Carcinogenic Total (µg/L)     | Contaminant-specific | Determined in this calculator |
| SL <sub>rec-water-ca-ing</sub> | Recreator Surface Water Carcinogenic Ingestion (µg/L)     | Contaminant-specific | Determined in this calculator |
| SL <sub>rec-water-ca-der</sub> | Recreator Surface Water Carcinogenic Dermal (µg/L)        | Contaminant-specific | Determined in this calculator |
| SL <sub>rec-water-ca-tot</sub> | Recreator Surface Water Carcinogenic Total (µg/L)         | Contaminant-specific | Determined in this calculator |
| SL <sub>rec-water-mu-ing</sub> | Recreator Surface Water Mutagenic Ingestion (µg/L)        | Mutagen-specific     | Determined in this calculator |
| SL <sub>rec-water-mu-der</sub> | Recreator Surface Water Mutagenic Dermal (µg/L)           | Mutagen-specific     | Determined in this calculator |
| SL <sub>rec-water-mu-tot</sub> | Recreator Surface Water Mutagenic Total (µg/L)            | Mutagen-specific     | Determined in this calculator |
| <b>Fish SLs</b>                |   |                      |                               |
| SL <sub>res-fsh-nc-ing</sub>   | Resident Fish Noncarcinogenic Ingestion (mg/kg)           | Contaminant-specific | Determined in this calculator |
| SL <sub>res-fsh-ca-ing</sub>   | Resident Fish Carcinogenic Ingestion (mg/kg)              | Contaminant-specific | Determined in this calculator |
| <b>Toxicity Values</b>         |   |                      |                               |

|                                       |   |   |   |
|---------------------------------------|---|---|---|
| RfD <sub>o</sub> or RFD <sub>OC</sub> | Chronic Oral Reference Dose (mg/kg-day)   | Contaminant-specific                                | EPA Superfund hierarchy                       |
| RfC or RFCIC                          | Chronic Inhalation Reference Concentration (mg/m <sup>3</sup> )                     | Contaminant-specific                                | EPA Superfund hierarchy                       |
| CSF <sub>o</sub> or SFO               | Oral Slope Factor (mg/kg-day) <sup>-1</sup>   | Contaminant-specific                                | EPA Superfund hierarchy                       |
| IUR                                   | Inhalation Unit Risk (μg/m <sup>3</sup> ) <sup>-1</sup>                             | Contaminant-specific                                | EPA Superfund hierarchy                       |
| <b>Miscellaneous Variables</b>        |   |   |   |
| TR                                    | target risk   | 1 x 10 <sup>-5</sup>                                | Selected by user                              |
| THQ                                   | target hazard quotient  | 1   | Selected by user                              |
| THI                                   | target hazard index   | 1   | Selected by user                              |
| K                                     | Andelman Volatilization Factor (L/m <sup>3</sup> )                                  | 0.5   | U.S. EPA 1991b (pg. 20)                       |
| K <sub>p</sub>                        | Dermal Permeability Constant (cm/hour)  | Contaminant-specific<br>Inorganic default = 0.001   | U.S. EPA 2004 Exhibit 3-1 and Section 3.1.2.1 |
| K <sub>p,ve</sub>                     | Steady-state Permeability Coefficient (cm/hour)                                     | Contaminant-specific                                | U.S. EPA 2004                                 |
| K <sub>ow</sub>                       | Equilibrium Partition Coefficient between epidermis and water (unitless)            | 1 - assuming epidermis behaves essentially as water | U.S. EPA 2004                                 |
| D <sub>e</sub>                        | Effective Diffusivity of absorbing chemical in the epidermis (cm <sup>2</sup> /sec) | (7.1 × 10 <sup>-6</sup> ) / (√MW)                   | U.S. EPA 2004                                 |
| L <sub>a</sub>                        | Effective Thickness of the Epidermis (cm)   | 10 <sup>-2</sup>                                    | U.S. EPA 2004                                 |

|                     |   |  |   |
|---------------------|---|--|---|
| AT <sub>res-c</sub> | Averaging time - resident child (days)  | $365 \times ED_{res-c} = 2190$   | U.S. EPA 1989 (pg. 6-23)  |
| AT <sub>res-a</sub> | Averaging time - resident adult (days)  | $365 \times ED_{res} = 9490$   | U.S. EPA 1989 (pg. 6-23)  |
| AT <sub>res</sub>   | Averaging time - resident age adjusted (days)   | $365 \times LT = 25550$  | U.S. EPA 1989 (pg. 6-23)  |
| AT <sub>rec-c</sub> | Averaging time - recreator child (days)   | $365 \times ED_{rec-c}$  | U.S. EPA 1989 (pg. 6-23)  |
| AT <sub>rec-a</sub> | Averaging time - recreator adult (days)   | $365 \times ED_{rec-a}$  | U.S. EPA 1989 (pg. 6-23)  |
| AT <sub>rec</sub>   | Averaging time - recreator (days)   | $365 \times LT$  | U.S. EPA 1989 (pg. 6-23)  |
| LT                  | Lifetime (years)  | 70   | U.S. EPA 1989 (pg. 6-22)  |
| $\Delta H_{v,b}$    | Enthalpy of vaporization at the normal boiling point (cal/mol)  | Contaminant-specific   | See Chemical-specific hierarchy   |
| $\Delta H_{v,gw}$   | Enthalpy of vaporization at temperature of groundwater (cal/mol)  | Contaminant-specific   | Determined in this calculator   |
| HLC                 | Henry's Law Constant at specified groundwater temperature (atm-m <sup>3</sup> /mol)   | Contaminant-specific   | See Chemical-specific hierarchy   |
| T <sub>gw</sub>     | Groundwater Temperatures (Kelvin)   | Site-specific  | Site-specific   |
| T <sub>c</sub>      | Critical Temperatures (Kelvin)  | Contaminant-specific   | See Chemical-specific hierarchy   |
| T <sub>b</sub>      | Normal Boiling Point (Kelvin)   | Contaminant-specific   | See Chemical-specific hierarchy   |
| n                   | If (T <sub>b</sub> /T <sub>c</sub> < 0.57)<br>If (T <sub>b</sub> /T <sub>c</sub> > 0.71)<br>If (0.57 < T <sub>b</sub> /T <sub>c</sub> ≤ 0.71) | n = 0.3<br>n = 0.41<br>n = (0.74 × T <sub>b</sub> /T <sub>c</sub> - 0.116) | U.S. EPA <a href="#">Fact Sheet</a><br>Unitless exponent values used to determine $\Delta H_{v,gw}$ |
| VPT <sub>gw</sub>   | Vapor Pressure at Groundwater Temperature (mmHg)  | Contaminant-specific   | Determined in this calculator   |

| VP  | Vapor Pressure at 25°C (mmHg)  | Contaminant-specific | Contaminant-specific   |
|---|--|----------------------|--|
| <b>Ingestion and Dermal Contact Rates</b> |  |                      |  |
| $IRW_{rec-c}$                             | Recreator Surface Water Ingestion Rate - Child (L/hour)                                | 0.12                 | U.S. EPA 2011, Table 3.5   |
| $IRW_{rec-a}$                             | Recreator Surface Water Ingestion Rate - Adult (L/hour)                                | 0.11                 | Time weighted average was calculated based on the upper percentile from U.S. EPA 2019, Table 3.7 |
| $IFW_{rec-adj}$                           | Recreator Surface Water Ingestion Rate - Age-adjusted (L/kg)                           | Site-specific        | Calculated using the age adjusted intake factors equation  |
| $IRW_{0-2}$                               | Surface Water Ingestion Rate - Age Segment 0-2 (L/hour)                                | 0.12                 | U.S. EPA 2011, Table 3.5   |
| $IRW_{2-6}$                               | Surface Water Ingestion Rate - Age Segment 2-6 (L/hour)                                | 0.12                 | U.S. EPA 2011, Table 3.5   |
| $IRW_{6-16}$                              | Surface Water Ingestion Rate - Age Segment 6-16 (L/hour)                               | 0.124                | Time weighted average was calculated based on the upper percentile from U.S. EPA 2019, Table 3.7 |
| $IRW_{16-26}$                             | Surface Water Ingestion Rate - Age Segment 16-26 (L/hour)                              | 0.0985               | Time weighted average was calculated based on the upper percentile from U.S. EPA 2019, Table 3.7 |
| $IFWM_{rec-adj}$                          | Recreator Mutagenic Surface Water Ingestion Rate - Age-adjusted (L/kg)                 | Site-specific        | Calculated using the age adjusted intake factors equation  |
| $DFW_{res-adj}$                           | Resident water dermal contact factor-age-adjusted ( $cm^2 \cdot event/kg$ )            | 2610650              | Calculated using the age adjusted intake factors equation  |
| $DFWM_{res-adj}$                          | Resident Mutagenic water dermal contact factor- age-adjusted ( $cm^2 \cdot event/kg$ ) | 8191633              | Calculated using the age adjusted intake factors equation  |

|                       |  |               |   |
|-----------------------|--|---------------|---|
| $DFW_{rec,adj}$       | Recreator water dermal contact factor- age-adjusted ( $cm^2$ - event/kg)           | Site-specific | Calculated using the age adjusted intake factors equation                       |
| $DFW_{rec,adj}^{mut}$ | Recreator Mutagenic water dermal contact factor- age-adjusted ( $cm^2$ - event/kg) | Site-specific | Calculated using the age adjusted intake factors equation                       |
| $IR_{res,a}$          | Fish Ingestion Rate (mg/day)   | Site-specific | Recommend using site-specific values  |
| $SA_{res,c}$          | Resident surface area water - child ( $cm^2$ )                                     | 6365          | U.S. EPA 2014, weighted average of mean values for children <6 years.           |
| $SA_{res,a}$          | Resident surface area water - adult ( $cm^2$ )                                     | 19652         | U.S. EPA 2014, weighted average of mean values for adults, male and female 21+. |
| $SA_{rec,c}$          | Recreator surface area water - child ( $cm^2$ )                                    | 6365          | U.S. EPA 2014, weighted average of mean values for children <6 years.           |
| $SA_{rec,a}$          | Recreator surface area water - adult ( $cm^2$ )                                    | 19652         | U.S. EPA 2014, weighted average of mean values for adults, male and female 21+. |
| $SA_{0-2}$            | Resident/Recreator surface area water - age segment 0-2 ( $cm^2$ )                 | 6365          | U.S. EPA 2014, weighted average of mean values for children <6 years.           |
| $SA_{2-6}$            | Resident/Recreator surface area water - age segment 2-6 ( $cm^2$ )                 | 6365          | U.S. EPA 2014, weighted average of mean values for children <6 years.           |
| $SA_{6-16}$           | Resident/Recreator surface area water - age segment 6-16 ( $cm^2$ )                | 19652         | U.S. EPA 2014, weighted average of mean values for adults, male and female 21+. |
| $SA_{16-26}$          | Resident/Recreator surface area water - age segment 16-26 ( $cm^2$ )               | 19652         | U.S. EPA 2014, weighted average of mean values                                  |

|              |  |  |   |
|--------------|--|--|---|
|              |  |  | for adults, male and female 21+.                                  |
| $BW_{res,c}$ | Resident Body Weight - child (kg)  | 15   | U.S. EPA 1991a (pg. 15)   |
| $BW_{res,a}$ | Resident Body Weight - adult (kg)  | 80   | U.S. EPA 2011, Table 8-3; weighted mean values for adults 21 - 78 |
| $BW_{rec,c}$ | Recreator Body Weight - child (kg)   | 15   | U.S. EPA 1991a (pg. 15)   |
| $BW_{rec,a}$ | Recreator Body Weight - adult (kg)   | 80   | U.S. EPA 2011, Table 8-3; weighted mean values for adults 21 - 78 |
| $BW_{0-2}$   | Resident/Recreator Body Weight - age segment 0-2 (kg)  | 15   | U.S. EPA 1991a (pg. 15)   |
| $BW_{2-6}$   | Resident/Recreator Body Weight - age segment 2-6 (kg)  | 15   | U.S. EPA 1991a (pg. 15)   |
| $BW_{6-16}$  | Resident/Recreator Body Weight - age segment 6-16 (kg)   | 80   | U.S. EPA 2011, Table 8-3; weighted mean values for adults 21 - 78 |
| $BW_{16-26}$ | Resident/Recreator Body Weight - age segment 16-26 (kg)  | 80   | U.S. EPA 2011, Table 8-3; weighted mean values for adults 21 - 78 |
| $ABS_d$      | Fraction of contaminant absorbed dermally from soil (unitless)   | Contaminant-specific<br>Inorganic default = none<br>VOC default = none<br>SVOC default = 0.1 | U.S. EPA 2004 (Exhibit 3-4 and section 3.2.2.4)                   |
| GIABS        | Fraction of contaminant absorbed in gastrointestinal tract (unitless) Note: if the GIABS is >50% then it is set to 100% for the calculation of dermal toxicity values. | Contaminant-specific<br>Inorganic default = 1.0<br>VOC default = 1.0<br>SVOC default = 1.0   | U.S. EPA 2004 (Exhibit 4-1 and section 4.2)                       |



|   |   |   |   |
|---|---|---|---|
| $DA_{\text{event}}$   | Absorbed dose per event ( $\mu\text{g}/\text{cm}^2$ - event)          | Contaminant-specific                        | U.S. EPA 2004 (Equation 3.2 and 3.3)                                |
| <b>Exposure Frequency, Exposure Duration, and Exposure Time Variables</b> |   |   |   |
| $EF_{\text{rec}}$   | Recreator Exposure Frequency (days/year)                              | Site-specific                               | Site-specific   |
| $EF_{\text{rec-c}}$   | Recreator Exposure Frequency - child (days/year)                      | Site-specific                               | Site-specific   |
| $EF_{\text{rec-a}}$   | Recreator Exposure Frequency - adult (days/year)                      | Site-specific                               | Site-specific   |
| $EF_{0-2}$  | Resident/Recreator Exposure Frequency - age segment 0-2 (days/year)   | Resident - 350<br>Recreator - Site-specific | Resident - U.S. EPA 1991a (pg. 15)<br>Recreator - Site-specific     |
| $EF_{2-6}$  | Resident/Recreator Exposure Frequency - age segment 2-6 (days/year)   | Resident - 350<br>Recreator - Site-specific | Resident - U.S. EPA 1991a (pg. 15)<br>Recreator - Site-specific     |
| $EF_{6-16}$   | Resident/Recreator Exposure Frequency - age segment 6-16 (days/year)  | Resident - 350<br>Recreator - Site-specific | Resident - U.S. EPA 1991a (pg. 15)<br>Recreator - Site-specific     |
| $EF_{16-26}$  | Resident/Recreator Exposure Frequency - age segment 16-26 (days/year) | Resident - 350<br>Recreator - Site-specific | Resident - U.S. EPA 1991a (pg. 15)<br>Recreator - Site-specific     |
| $ED_{\text{rec}}$   | Recreator Exposure Duration (years)                                   | 26  | EPA 2011, Table 16-108; 90th percentile for current residence time. |
| $ED_{\text{rec-c}}$   | Recreator Exposure Duration - child (years)                           | 6   | U.S. EPA 1991a (pg. 15)   |
| $ED_{\text{rec-a}}$   | Recreator Exposure Duration - adult (years)                           | 20  | $ED_{\text{rec}}$ (26 years) - $ED_{\text{rec-c}}$ (6 years)        |
| $ED_{0-2}$  | Resident/Recreator Exposure Duration - age segment 0-2 (years)        | 2   | U.S. EPA 2005 (pg. 37)  |

|                                |  |               |   |
|--------------------------------|--|---------------|---|
| ED <sub>2-6</sub>              | Resident/Recreator Exposure Duration - age segment 2-6 (years)   | 4             | U.S. EPA 2005 (pg. 37)                                    |
| ED <sub>6-16</sub>             | Resident/Recreator Exposure Duration - age segment 6-16 (years)  | 10            | U.S. EPA 2005 (pg. 37)                                    |
| ED <sub>16-26</sub>            | Resident/Recreator Exposure Duration - age segment 16-26 (years) | 10            | U.S. EPA 2005 (pg. 37)                                    |
| ET <sub>rec</sub>              | Recreator Exposure Time (hours/day)                              | Site-specific | Site-specific   |
| ET <sub>rec-c</sub>            | Recreator Exposure Time - child (hours/day)                      | Site-specific | Site-specific   |
| ET <sub>rec-a</sub>            | Recreator Exposure Time - adult (hours/day)                      | Site-specific | Site-specific   |
| ET <sub>event-rec-c</sub>      | Recreator Surface Water Exposure Time - child (hours/event)      | Site-specific | Site-specific   |
| ET <sub>event-rec-a</sub>      | Recreator Surface Water Exposure Time - adult (hours/event)      | Site-specific | Site-specific   |
| ET <sub>event-rec-adj</sub>    | Recreator Exposure Time - age-adjusted (hours/event)             | Site-specific | Calculated using the age adjusted intake factors equation |
| ET <sub>event-rec(0-2)</sub>   | Recreator Exposure Time - age segment 0-2 (hours/event)          | Site-specific | Site-specific   |
| ET <sub>event-rec(2-6)</sub>   | Recreator Exposure Time - age segment 2-6 (hours/event)          | Site-specific | Site-specific   |
| ET <sub>event-rec(6-16)</sub>  | Recreator Exposure Time - age segment 6-16 (hours/event)         | Site-specific | Site-specific   |
| ET <sub>event-rec(16-26)</sub> | Recreator Exposure Time - age segment 16-26 (hours/event)        | Site-specific | Site-specific   |

|                              |  |   |   |
|------------------------------|--|---|---|
| $ET_{\text{event-rec-madj}}$ | Recreator Exposure Time - age-adjusted (hours/event)       | Site-specific                             | Calculated using the age adjusted intake factors equation |
| $EV_{\text{rec-c}}$          | Recreator Events - child (events/day)                      | Site-specific                             | Site-specific   |
| $EV_{\text{rec-a}}$          | Recreator Events - adult (events/day)                      | Site-specific                             | Site-specific   |
| $EV_{0-2}$                   | Resident/Recreator Events - age segment 0-2 (events/day)   | Resident - 1<br>Recreator - Site-specific | U.S. EPA 2004; Exhibit 3-2                                |
| $EV_{2-6}$                   | Resident/Recreator Events - age segment 2-6 (events/day)   | Resident - 1<br>Recreator - Site-specific | U.S. EPA 2004; Exhibit 3-2                                |
| $EV_{6-16}$                  | Resident/Recreator Events - age segment 6-16 (events/day)  | Resident - 1<br>Recreator - Site-specific | U.S. EPA 2004; Exhibit 3-2                                |
| $EV_{16-26}$                 | Resident/Recreator Events - age segment 16-26 (events/day) | Resident - 1<br>Recreator - Site-specific | U.S. EPA 2004; Exhibit 3-2                                |