



**Groundwater Sample Results,  
Combined Level 2 and Level 4 Laboratory Report,  
Electronic Data Deliverable, Data Validation Report,  
and the Sample Location Report, SDG 320-41679-1**

*Naval Air Station Willow Grove  
Willow Grove, Pennsylvania*

August 2019

N00158\_000777  
WILLOW\_GROVE\_NAS  
SSIC 5000-33c

**LABORATORY DATA PACKAGE, 320-41679-1, NAWC WARMINSTER NAS  
WILLOW GROVE PA**

08/15/2018  
TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

## ANALYTICAL REPORT

Job Number: 320-41679-1

Job Description: WE04

For:

Tetra Tech, Inc.

234 Mall Boulevard

Suite 260

King of Prussia, PA 19406

Attention: Andy Frebowitz



Approved for release.  
David R Alltucker  
Project Manager I  
8/15/2018 2:19 PM

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08/15/2018

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# Definitions/Glossary

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

## Qualifiers

### LCMS

| Qualifier | Qualifier Description                                                               |
|-----------|-------------------------------------------------------------------------------------|
| U         | Undetected at the Limit of Detection.                                               |
| J         | Estimated: The analyte was positively identified; the quantitation is an estimation |
| M         | Manual integrated compound.                                                         |

## Glossary

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

**Job Narrative**  
**320-41679-1**

**Receipt**

The samples were received on 8/1/2018 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.7° C.

**LCMS**

Method(s) 537: The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**Organic Prep**

Method(s) 537: The following sample: NAWC-073118-RW-154 (320-41679-3) in preparation batch 320-237969 was observed to be a yellow color prior to extraction and after it was brought to final volume.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

## Client Sample ID: WGNA-073118-RW-3785

## Lab Sample ID: 320-41679-1

| Analyte                              | Result | Qualifier | LOQ | DL  | Unit | Dil Fac | D | Method | Prep Type |
|--------------------------------------|--------|-----------|-----|-----|------|---------|---|--------|-----------|
| Perfluorooctanesulfonic acid (PFOS)  | 11     | J         | 42  | 7.1 | ng/L | 1       |   | 537    | Total/NA  |
| Perfluorooctanoic acid (PFOA)        | 16     | J         | 21  | 2.9 | ng/L | 1       |   | 537    | Total/NA  |
| Perfluorohexanesulfonic acid (PFHxS) | 15     | J         | 31  | 5.7 | ng/L | 1       |   | 537    | Total/NA  |
| Perfluoroheptanoic acid (PFHpA)      | 5.9    | J         | 10  | 2.0 | ng/L | 1       |   | 537    | Total/NA  |

## Client Sample ID: WGNA-073118-FRB-3785

## Lab Sample ID: 320-41679-2

No Detections.

## Client Sample ID: NAWC-073118-RW-154

## Lab Sample ID: 320-41679-3

| Analyte                             | Result | Qualifier | LOQ | DL  | Unit | Dil Fac | D | Method | Prep Type |
|-------------------------------------|--------|-----------|-----|-----|------|---------|---|--------|-----------|
| Perfluorooctanesulfonic acid (PFOS) | 17     | J         | 39  | 6.7 | ng/L | 1       |   | 537    | Total/NA  |
| Perfluorooctanoic acid (PFOA)       | 24     |           | 20  | 2.8 | ng/L | 1       |   | 537    | Total/NA  |
| Perfluoroheptanoic acid (PFHpA)     | 8.9    | J         | 9.8 | 1.9 | ng/L | 1       |   | 537    | Total/NA  |

## Client Sample ID: NAWC-073118-FRB-154

## Lab Sample ID: 320-41679-4

No Detections.

## Client Sample ID: NAWC-073118-RW-185

## Lab Sample ID: 320-41679-5

| Analyte                              | Result | Qualifier | LOQ | DL  | Unit | Dil Fac | D | Method | Prep Type |
|--------------------------------------|--------|-----------|-----|-----|------|---------|---|--------|-----------|
| Perfluorooctanesulfonic acid (PFOS)  | 15     | J         | 38  | 6.4 | ng/L | 1       |   | 537    | Total/NA  |
| Perfluorooctanoic acid (PFOA)        | 12     | J         | 19  | 2.6 | ng/L | 1       |   | 537    | Total/NA  |
| Perfluorohexanesulfonic acid (PFHxS) | 8.5    | J         | 28  | 5.2 | ng/L | 1       |   | 537    | Total/NA  |
| Perfluoroheptanoic acid (PFHpA)      | 8.2    | J         | 9.4 | 1.8 | ng/L | 1       |   | 537    | Total/NA  |

## Client Sample ID: NAWC-073118-FRB-185

## Lab Sample ID: 320-41679-6

No Detections.

## Client Sample ID: NAWC-073118-RW-179

## Lab Sample ID: 320-41679-7

| Analyte                              | Result | Qualifier | LOQ | DL  | Unit | Dil Fac | D | Method | Prep Type |
|--------------------------------------|--------|-----------|-----|-----|------|---------|---|--------|-----------|
| Perfluorooctanesulfonic acid (PFOS)  | 17     | J         | 39  | 6.6 | ng/L | 1       |   | 537    | Total/NA  |
| Perfluorooctanoic acid (PFOA)        | 21     |           | 19  | 2.7 | ng/L | 1       |   | 537    | Total/NA  |
| Perfluorohexanesulfonic acid (PFHxS) | 7.1    | J         | 29  | 5.3 | ng/L | 1       |   | 537    | Total/NA  |
| Perfluoroheptanoic acid (PFHpA)      | 6.0    | J         | 9.7 | 1.8 | ng/L | 1       |   | 537    | Total/NA  |

## Client Sample ID: NAWC-073118-FRB-179

## Lab Sample ID: 320-41679-8

No Detections.

## Client Sample ID: NAWC-073118-RW-124

## Lab Sample ID: 320-41679-9

| Analyte                              | Result | Qualifier | LOQ | DL  | Unit | Dil Fac | D | Method | Prep Type |
|--------------------------------------|--------|-----------|-----|-----|------|---------|---|--------|-----------|
| Perfluorooctanesulfonic acid (PFOS)  | 31     | J         | 39  | 6.7 | ng/L | 1       |   | 537    | Total/NA  |
| Perfluorooctanoic acid (PFOA)        | 20     |           | 20  | 2.8 | ng/L | 1       |   | 537    | Total/NA  |
| Perfluorohexanesulfonic acid (PFHxS) | 14     | J         | 30  | 5.4 | ng/L | 1       |   | 537    | Total/NA  |
| Perfluoroheptanoic acid (PFHpA)      | 4.7    | J         | 9.9 | 1.9 | ng/L | 1       |   | 537    | Total/NA  |

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento



Detection Summary

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

Client Sample ID: NAWC-073118-FRB-124

Lab Sample ID: 320-41679-10

No Detections.

Client Sample ID: WGNA-073118-RW-3103

Lab Sample ID: 320-41679-11

| Analyte                             | Result | Qualifier | LOQ | DL  | Unit | Dil Fac | D | Method | Prep Type |
|-------------------------------------|--------|-----------|-----|-----|------|---------|---|--------|-----------|
| Perfluorooctanesulfonic acid (PFOS) | 7.1    | J         | 39  | 6.6 | ng/L | 1       |   | 537    | Total/NA  |
| Perfluorooctanoic acid (PFOA)       | 8.3    | J         | 19  | 2.7 | ng/L | 1       |   | 537    | Total/NA  |
| Perfluoroheptanoic acid (PFHpA)     | 2.4    | J M       | 9.6 | 1.8 | ng/L | 1       |   | 537    | Total/NA  |

Client Sample ID: WGNA-073118-FRB-3103

Lab Sample ID: 320-41679-12

No Detections.

# Client Sample Results

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

**Client Sample ID: WGNA-073118-RW-3785**

**Date Collected: 07/31/18 08:40**

**Date Received: 08/01/18 09:45**

**Lab Sample ID: 320-41679-1**

**Matrix: Water**

**Method: 537 - Perfluorinated Alkyl Acids (LC/MS)**

| Analyte                              | Result    | Qualifier | LOQ      | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|--------------------------------------|-----------|-----------|----------|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS)  | 11        | J         | 42       | 7.1 | ng/L | — | 08/04/18 08:24 | 08/08/18 04:50 | 1       |
| Perfluorooctanoic acid (PFOA)        | 16        | J         | 21       | 2.9 | ng/L | — | 08/04/18 08:24 | 08/08/18 04:50 | 1       |
| Perfluorononanoic acid (PFNA)        | 21        | U         | 25       | 8.3 | ng/L | — | 08/04/18 08:24 | 08/08/18 04:50 | 1       |
| Perfluorohexanesulfonic acid (PFHxS) | 15        | J         | 31       | 5.7 | ng/L | — | 08/04/18 08:24 | 08/08/18 04:50 | 1       |
| Perfluoroheptanoic acid (PFHpA)      | 5.9       | J         | 10       | 2.0 | ng/L | — | 08/04/18 08:24 | 08/08/18 04:50 | 1       |
| Perfluorobutanesulfonic acid (PFBS)  | 37        | U         | 94       | 17  | ng/L | — | 08/04/18 08:24 | 08/08/18 04:50 | 1       |
| Surrogate                            | %Recovery | Qualifier | Limits   |     |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C2 PFHxA                           | 88        |           | 70 - 130 |     |      |   | 08/04/18 08:24 | 08/08/18 04:50 | 1       |
| 13C2 PFDA                            | 103       |           | 70 - 130 |     |      |   | 08/04/18 08:24 | 08/08/18 04:50 | 1       |

**Client Sample ID: WGNA-073118-FRB-3785**

**Date Collected: 07/31/18 08:35**

**Date Received: 08/01/18 09:45**

**Lab Sample ID: 320-41679-2**

**Matrix: Water**

**Method: 537 - Perfluorinated Alkyl Acids (LC/MS)**

| Analyte                              | Result    | Qualifier | LOQ      | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|--------------------------------------|-----------|-----------|----------|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS)  | 15        | U         | 38       | 6.5 | ng/L | — | 08/04/18 08:24 | 08/08/18 05:04 | 1       |
| Perfluorooctanoic acid (PFOA)        | 7.6       | U         | 19       | 2.7 | ng/L | — | 08/04/18 08:24 | 08/08/18 05:04 | 1       |
| Perfluorononanoic acid (PFNA)        | 19        | U         | 23       | 7.6 | ng/L | — | 08/04/18 08:24 | 08/08/18 05:04 | 1       |
| Perfluorohexanesulfonic acid (PFHxS) | 11        | U         | 29       | 5.3 | ng/L | — | 08/04/18 08:24 | 08/08/18 05:04 | 1       |
| Perfluoroheptanoic acid (PFHpA)      | 3.8       | U         | 9.6      | 1.8 | ng/L | — | 08/04/18 08:24 | 08/08/18 05:04 | 1       |
| Perfluorobutanesulfonic acid (PFBS)  | 34        | U         | 86       | 15  | ng/L | — | 08/04/18 08:24 | 08/08/18 05:04 | 1       |
| Surrogate                            | %Recovery | Qualifier | Limits   |     |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C2 PFHxA                           | 86        |           | 70 - 130 |     |      |   | 08/04/18 08:24 | 08/08/18 05:04 | 1       |
| 13C2 PFDA                            | 97        |           | 70 - 130 |     |      |   | 08/04/18 08:24 | 08/08/18 05:04 | 1       |

**Client Sample ID: NAWC-073118-RW-154**

**Date Collected: 07/31/18 10:10**

**Date Received: 08/01/18 09:45**

**Lab Sample ID: 320-41679-3**

**Matrix: Water**

**Method: 537 - Perfluorinated Alkyl Acids (LC/MS)**

| Analyte                              | Result    | Qualifier | LOQ      | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|--------------------------------------|-----------|-----------|----------|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS)  | 17        | J         | 39       | 6.7 | ng/L | — | 08/04/18 08:24 | 08/08/18 05:09 | 1       |
| Perfluorooctanoic acid (PFOA)        | 24        |           | 20       | 2.8 | ng/L | — | 08/04/18 08:24 | 08/08/18 05:09 | 1       |
| Perfluorononanoic acid (PFNA)        | 20        | U         | 24       | 7.9 | ng/L | — | 08/04/18 08:24 | 08/08/18 05:09 | 1       |
| Perfluorohexanesulfonic acid (PFHxS) | 12        | U         | 29       | 5.4 | ng/L | — | 08/04/18 08:24 | 08/08/18 05:09 | 1       |
| Perfluoroheptanoic acid (PFHpA)      | 8.9       | J         | 9.8      | 1.9 | ng/L | — | 08/04/18 08:24 | 08/08/18 05:09 | 1       |
| Perfluorobutanesulfonic acid (PFBS)  | 35        | U         | 88       | 16  | ng/L | — | 08/04/18 08:24 | 08/08/18 05:09 | 1       |
| Surrogate                            | %Recovery | Qualifier | Limits   |     |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C2 PFHxA                           | 80        |           | 70 - 130 |     |      |   | 08/04/18 08:24 | 08/08/18 05:09 | 1       |
| 13C2 PFDA                            | 94        |           | 70 - 130 |     |      |   | 08/04/18 08:24 | 08/08/18 05:09 | 1       |

# Client Sample Results

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

**Client Sample ID: NAWC-073118-FRB-154**

**Lab Sample ID: 320-41679-4**

**Date Collected: 07/31/18 10:05**

**Matrix: Water**

**Date Received: 08/01/18 09:45**

## Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

| Analyte                              | Result | Qualifier | LOQ | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|--------------------------------------|--------|-----------|-----|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS)  | 16     | U         | 39  | 6.6 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:13 | 1       |
| Perfluorooctanoic acid (PFOA)        | 7.8    | U         | 19  | 2.7 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:13 | 1       |
| Perfluorononanoic acid (PFNA)        | 19     | U         | 23  | 7.8 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:13 | 1       |
| Perfluorohexanesulfonic acid (PFHxS) | 12     | U         | 29  | 5.3 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:13 | 1       |
| Perfluoroheptanoic acid (PFHpA)      | 3.9    | U         | 9.7 | 1.8 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:13 | 1       |
| Perfluorobutanesulfonic acid (PFBS)  | 35     | U         | 87  | 16  | ng/L |   | 08/04/18 08:24 | 08/08/18 05:13 | 1       |

| Surrogate  | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA | 86        |           | 70 - 130 | 08/04/18 08:24 | 08/08/18 05:13 | 1       |
| 13C2 PFDA  | 98        |           | 70 - 130 | 08/04/18 08:24 | 08/08/18 05:13 | 1       |

**Client Sample ID: NAWC-073118-RW-185**

**Lab Sample ID: 320-41679-5**

**Date Collected: 07/31/18 11:10**

**Matrix: Water**

**Date Received: 08/01/18 09:45**

## Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

| Analyte                              | Result | Qualifier | LOQ | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|--------------------------------------|--------|-----------|-----|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS)  | 15     | J         | 38  | 6.4 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:18 | 1       |
| Perfluorooctanoic acid (PFOA)        | 12     | J         | 19  | 2.6 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:18 | 1       |
| Perfluorononanoic acid (PFNA)        | 19     | U         | 23  | 7.5 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:18 | 1       |
| Perfluorohexanesulfonic acid (PFHxS) | 8.5    | J         | 28  | 5.2 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:18 | 1       |
| Perfluoroheptanoic acid (PFHpA)      | 8.2    | J         | 9.4 | 1.8 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:18 | 1       |
| Perfluorobutanesulfonic acid (PFBS)  | 34     | U         | 85  | 15  | ng/L |   | 08/04/18 08:24 | 08/08/18 05:18 | 1       |

| Surrogate  | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA | 81        |           | 70 - 130 | 08/04/18 08:24 | 08/08/18 05:18 | 1       |
| 13C2 PFDA  | 94        |           | 70 - 130 | 08/04/18 08:24 | 08/08/18 05:18 | 1       |

**Client Sample ID: NAWC-073118-FRB-185**

**Lab Sample ID: 320-41679-6**

**Date Collected: 07/31/18 11:05**

**Matrix: Water**

**Date Received: 08/01/18 09:45**

## Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

| Analyte                              | Result | Qualifier | LOQ | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|--------------------------------------|--------|-----------|-----|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS)  | 16     | U         | 41  | 7.0 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:23 | 1       |
| Perfluorooctanoic acid (PFOA)        | 8.2    | U         | 20  | 2.9 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:23 | 1       |
| Perfluorononanoic acid (PFNA)        | 20     | U         | 25  | 8.2 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:23 | 1       |
| Perfluorohexanesulfonic acid (PFHxS) | 12     | U         | 31  | 5.6 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:23 | 1       |
| Perfluoroheptanoic acid (PFHpA)      | 4.1    | U         | 10  | 1.9 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:23 | 1       |
| Perfluorobutanesulfonic acid (PFBS)  | 37     | U         | 92  | 16  | ng/L |   | 08/04/18 08:24 | 08/08/18 05:23 | 1       |

| Surrogate  | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA | 98        |           | 70 - 130 | 08/04/18 08:24 | 08/08/18 05:23 | 1       |
| 13C2 PFDA  | 103       |           | 70 - 130 | 08/04/18 08:24 | 08/08/18 05:23 | 1       |

TestAmerica Sacramento

# Client Sample Results

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

**Client Sample ID: NAWC-073118-RW-179**

**Lab Sample ID: 320-41679-7**

**Date Collected: 07/31/18 12:10**

**Matrix: Water**

**Date Received: 08/01/18 09:45**

## Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

| Analyte                              | Result    | Qualifier | LOQ      | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|--------------------------------------|-----------|-----------|----------|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS)  | 17        | J         | 39       | 6.6 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:37 | 1       |
| Perfluorooctanoic acid (PFOA)        | 21        |           | 19       | 2.7 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:37 | 1       |
| Perfluorononanoic acid (PFNA)        | 19        | U         | 23       | 7.8 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:37 | 1       |
| Perfluorohexanesulfonic acid (PFHxS) | 7.1       | J         | 29       | 5.3 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:37 | 1       |
| Perfluoroheptanoic acid (PFHpA)      | 6.0       | J         | 9.7      | 1.8 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:37 | 1       |
| Perfluorobutanesulfonic acid (PFBS)  | 35        | U         | 87       | 16  | ng/L |   | 08/04/18 08:24 | 08/08/18 05:37 | 1       |
| Surrogate                            | %Recovery | Qualifier | Limits   |     |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C2 PFHxA                           | 87        |           | 70 - 130 |     |      |   | 08/04/18 08:24 | 08/08/18 05:37 | 1       |
| 13C2 PFDA                            | 101       |           | 70 - 130 |     |      |   | 08/04/18 08:24 | 08/08/18 05:37 | 1       |

**Client Sample ID: NAWC-073118-FRB-179**

**Lab Sample ID: 320-41679-8**

**Date Collected: 07/31/18 12:05**

**Matrix: Water**

**Date Received: 08/01/18 09:45**

## Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

| Analyte                              | Result    | Qualifier | LOQ      | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|--------------------------------------|-----------|-----------|----------|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS)  | 16        | U         | 40       | 6.7 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:41 | 1       |
| Perfluorooctanoic acid (PFOA)        | 7.9       | U         | 20       | 2.8 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:41 | 1       |
| Perfluorononanoic acid (PFNA)        | 20        | U         | 24       | 7.9 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:41 | 1       |
| Perfluorohexanesulfonic acid (PFHxS) | 12        | U         | 30       | 5.4 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:41 | 1       |
| Perfluoroheptanoic acid (PFHpA)      | 4.0       | U         | 9.9      | 1.9 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:41 | 1       |
| Perfluorobutanesulfonic acid (PFBS)  | 36        | U         | 89       | 16  | ng/L |   | 08/04/18 08:24 | 08/08/18 05:41 | 1       |
| Surrogate                            | %Recovery | Qualifier | Limits   |     |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C2 PFHxA                           | 87        |           | 70 - 130 |     |      |   | 08/04/18 08:24 | 08/08/18 05:41 | 1       |
| 13C2 PFDA                            | 101       |           | 70 - 130 |     |      |   | 08/04/18 08:24 | 08/08/18 05:41 | 1       |

**Client Sample ID: NAWC-073118-RW-124**

**Lab Sample ID: 320-41679-9**

**Date Collected: 07/31/18 12:40**

**Matrix: Water**

**Date Received: 08/01/18 09:45**

## Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

| Analyte                              | Result    | Qualifier | LOQ      | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|--------------------------------------|-----------|-----------|----------|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS)  | 31        | J         | 39       | 6.7 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:46 | 1       |
| Perfluorooctanoic acid (PFOA)        | 20        |           | 20       | 2.8 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:46 | 1       |
| Perfluorononanoic acid (PFNA)        | 20        | U         | 24       | 7.9 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:46 | 1       |
| Perfluorohexanesulfonic acid (PFHxS) | 14        | J         | 30       | 5.4 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:46 | 1       |
| Perfluoroheptanoic acid (PFHpA)      | 4.7       | J         | 9.9      | 1.9 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:46 | 1       |
| Perfluorobutanesulfonic acid (PFBS)  | 35        | U         | 89       | 16  | ng/L |   | 08/04/18 08:24 | 08/08/18 05:46 | 1       |
| Surrogate                            | %Recovery | Qualifier | Limits   |     |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C2 PFHxA                           | 83        |           | 70 - 130 |     |      |   | 08/04/18 08:24 | 08/08/18 05:46 | 1       |
| 13C2 PFDA                            | 94        |           | 70 - 130 |     |      |   | 08/04/18 08:24 | 08/08/18 05:46 | 1       |

TestAmerica Sacramento

# Client Sample Results

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

**Client Sample ID: NAWC-073118-FRB-124**

**Lab Sample ID: 320-41679-10**

**Date Collected: 07/31/18 12:35**

**Matrix: Water**

**Date Received: 08/01/18 09:45**

**Method: 537 - Perfluorinated Alkyl Acids (LC/MS)**

| Analyte                              | Result | Qualifier | LOQ | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|--------------------------------------|--------|-----------|-----|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS)  | 16     | U         | 39  | 6.7 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:51 | 1       |
| Perfluorooctanoic acid (PFOA)        | 7.9    | U         | 20  | 2.8 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:51 | 1       |
| Perfluorononanoic acid (PFNA)        | 20     | U         | 24  | 7.9 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:51 | 1       |
| Perfluorohexanesulfonic acid (PFHxS) | 12     | U         | 29  | 5.4 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:51 | 1       |
| Perfluoroheptanoic acid (PFHpA)      | 3.9    | U         | 9.8 | 1.9 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:51 | 1       |
| Perfluorobutanesulfonic acid (PFBS)  | 35     | U         | 88  | 16  | ng/L |   | 08/04/18 08:24 | 08/08/18 05:51 | 1       |

| Surrogate  | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA | 87        |           | 70 - 130 | 08/04/18 08:24 | 08/08/18 05:51 | 1       |
| 13C2 PFDA  | 91        |           | 70 - 130 | 08/04/18 08:24 | 08/08/18 05:51 | 1       |

**Client Sample ID: WGNA-073118-RW-3103**

**Lab Sample ID: 320-41679-11**

**Date Collected: 07/31/18 13:40**

**Matrix: Water**

**Date Received: 08/01/18 09:45**

**Method: 537 - Perfluorinated Alkyl Acids (LC/MS)**

| Analyte                              | Result | Qualifier | LOQ | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|--------------------------------------|--------|-----------|-----|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS)  | 7.1    | J         | 39  | 6.6 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:55 | 1       |
| Perfluorooctanoic acid (PFOA)        | 8.3    | J         | 19  | 2.7 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:55 | 1       |
| Perfluorononanoic acid (PFNA)        | 19     | U         | 23  | 7.7 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:55 | 1       |
| Perfluorohexanesulfonic acid (PFHxS) | 12     | U         | 29  | 5.3 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:55 | 1       |
| Perfluoroheptanoic acid (PFHpA)      | 2.4    | J M       | 9.6 | 1.8 | ng/L |   | 08/04/18 08:24 | 08/08/18 05:55 | 1       |
| Perfluorobutanesulfonic acid (PFBS)  | 35     | U M       | 87  | 16  | ng/L |   | 08/04/18 08:24 | 08/08/18 05:55 | 1       |

| Surrogate  | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA | 90        |           | 70 - 130 | 08/04/18 08:24 | 08/08/18 05:55 | 1       |
| 13C2 PFDA  | 99        |           | 70 - 130 | 08/04/18 08:24 | 08/08/18 05:55 | 1       |

**Client Sample ID: WGNA-073118-FRB-3103**

**Lab Sample ID: 320-41679-12**

**Date Collected: 07/31/18 13:35**

**Matrix: Water**

**Date Received: 08/01/18 09:45**

**Method: 537 - Perfluorinated Alkyl Acids (LC/MS)**

| Analyte                              | Result | Qualifier | LOQ | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|--------------------------------------|--------|-----------|-----|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS)  | 15     | U         | 38  | 6.5 | ng/L |   | 08/04/18 08:24 | 08/08/18 06:00 | 1       |
| Perfluorooctanoic acid (PFOA)        | 7.7    | U         | 19  | 2.7 | ng/L |   | 08/04/18 08:24 | 08/08/18 06:00 | 1       |
| Perfluorononanoic acid (PFNA)        | 19     | U         | 23  | 7.7 | ng/L |   | 08/04/18 08:24 | 08/08/18 06:00 | 1       |
| Perfluorohexanesulfonic acid (PFHxS) | 12     | U         | 29  | 5.3 | ng/L |   | 08/04/18 08:24 | 08/08/18 06:00 | 1       |
| Perfluoroheptanoic acid (PFHpA)      | 3.8    | U         | 9.6 | 1.8 | ng/L |   | 08/04/18 08:24 | 08/08/18 06:00 | 1       |
| Perfluorobutanesulfonic acid (PFBS)  | 35     | U         | 86  | 15  | ng/L |   | 08/04/18 08:24 | 08/08/18 06:00 | 1       |

| Surrogate  | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA | 85        |           | 70 - 130 | 08/04/18 08:24 | 08/08/18 06:00 | 1       |
| 13C2 PFDA  | 92        |           | 70 - 130 | 08/04/18 08:24 | 08/08/18 06:00 | 1       |

## Default Detection Limits

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

### Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

#### Prep: 537

| Analyte                              | LOQ | DL  | Units | Method |
|--------------------------------------|-----|-----|-------|--------|
| Perfluorobutanesulfonic acid (PFBS)  | 90  | 16  | ng/L  | 537    |
| Perfluoroheptanoic acid (PFHpA)      | 10  | 1.9 | ng/L  | 537    |
| Perfluorohexanesulfonic acid (PFHxS) | 30  | 5.5 | ng/L  | 537    |
| Perfluorononanoic acid (PFNA)        | 24  | 8.0 | ng/L  | 537    |
| Perfluorooctanesulfonic acid (PFOS)  | 40  | 6.8 | ng/L  | 537    |
| Perfluorooctanoic acid (PFOA)        | 20  | 2.8 | ng/L  | 537    |

# Surrogate Summary

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

## Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Matrix: Water

Prep Type: Total/NA

|                    |                      | Percent Surrogate Recovery (Acceptance Limits) |                  |
|--------------------|----------------------|------------------------------------------------|------------------|
| Lab Sample ID      | Client Sample ID     | PFHxA<br>(70-130)                              | PFDA<br>(70-130) |
| 320-41679-1        | WGNA-073118-RW-3785  | 88                                             | 103              |
| 320-41679-1 MS     | WGNA-073118-RW-3785  | 90                                             | 98               |
| 320-41679-1 MSD    | WGNA-073118-RW-3785  | 86                                             | 99               |
| 320-41679-2        | WGNA-073118-FRB-3785 | 86                                             | 97               |
| 320-41679-3        | NAWC-073118-RW-154   | 80                                             | 94               |
| 320-41679-4        | NAWC-073118-FRB-154  | 86                                             | 98               |
| 320-41679-5        | NAWC-073118-RW-185   | 81                                             | 94               |
| 320-41679-6        | NAWC-073118-FRB-185  | 98                                             | 103              |
| 320-41679-7        | NAWC-073118-RW-179   | 87                                             | 101              |
| 320-41679-8        | NAWC-073118-FRB-179  | 87                                             | 101              |
| 320-41679-9        | NAWC-073118-RW-124   | 83                                             | 94               |
| 320-41679-10       | NAWC-073118-FRB-124  | 87                                             | 91               |
| 320-41679-11       | WGNA-073118-RW-3103  | 90                                             | 99               |
| 320-41679-12       | WGNA-073118-FRB-3103 | 85                                             | 92               |
| LCS 320-237969/2-A | Lab Control Sample   | 88                                             | 94               |
| MB 320-237969/1-A  | Method Blank         | 90                                             | 95               |

### Surrogate Legend

PFHxA = 13C2 PFHxA

PFDA = 13C2 PFDA

# QC Sample Results

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

## Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Lab Sample ID: MB 320-237969/1-A

Matrix: Water

Analysis Batch: 238610

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 237969

| Analyte                              | MB Result | MB Qualifier | LOQ | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|--------------------------------------|-----------|--------------|-----|-----|------|---|----------------|----------------|---------|
| Perfluorooctanesulfonic acid (PFOS)  | 16        | U            | 40  | 6.8 | ng/L |   | 08/04/18 08:24 | 08/08/18 04:40 | 1       |
| Perfluorooctanoic acid (PFOA)        | 8.0       | U            | 20  | 2.8 | ng/L |   | 08/04/18 08:24 | 08/08/18 04:40 | 1       |
| Perfluorononanoic acid (PFNA)        | 20        | U            | 24  | 8.0 | ng/L |   | 08/04/18 08:24 | 08/08/18 04:40 | 1       |
| Perfluorohexanesulfonic acid (PFHxS) | 12        | U            | 30  | 5.5 | ng/L |   | 08/04/18 08:24 | 08/08/18 04:40 | 1       |
| Perfluoroheptanoic acid (PFHpA)      | 4.0       | U            | 10  | 1.9 | ng/L |   | 08/04/18 08:24 | 08/08/18 04:40 | 1       |
| Perfluorobutanesulfonic acid (PFBS)  | 36        | U            | 90  | 16  | ng/L |   | 08/04/18 08:24 | 08/08/18 04:40 | 1       |

| Surrogate  | MB %Recovery | MB Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------|--------------|--------------|----------|----------------|----------------|---------|
| 13C2 PFHxA | 90           |              | 70 - 130 | 08/04/18 08:24 | 08/08/18 04:40 | 1       |
| 13C2 PFDA  | 95           |              | 70 - 130 | 08/04/18 08:24 | 08/08/18 04:40 | 1       |

Lab Sample ID: LCS 320-237969/2-A

Matrix: Water

Analysis Batch: 238610

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 237969

| Analyte                              | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|--------------------------------------|-------------|------------|---------------|------|---|------|--------------|
| Perfluorooctanesulfonic acid (PFOS)  | 132         | 138        |               | ng/L |   | 104  | 70 - 130     |
| Perfluorooctanoic acid (PFOA)        | 66.0        | 68.3       |               | ng/L |   | 103  | 70 - 130     |
| Perfluorononanoic acid (PFNA)        | 66.0        | 64.4       |               | ng/L |   | 98   | 70 - 130     |
| Perfluorohexanesulfonic acid (PFHxS) | 100         | 107        |               | ng/L |   | 107  | 70 - 130     |
| Perfluoroheptanoic acid (PFHpA)      | 32.0        | 32.1       |               | ng/L |   | 100  | 70 - 130     |
| Perfluorobutanesulfonic acid (PFBS)  | 300         | 321        |               | ng/L |   | 107  | 70 - 130     |

| Surrogate  | LCS %Recovery | LCS Qualifier | Limits   |
|------------|---------------|---------------|----------|
| 13C2 PFHxA | 88            |               | 70 - 130 |
| 13C2 PFDA  | 94            |               | 70 - 130 |

Lab Sample ID: 320-41679-1 MS

Matrix: Water

Analysis Batch: 238610

Client Sample ID: WGNA-073118-RW-3785

Prep Type: Total/NA

Prep Batch: 237969

| Analyte                              | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|--------------------------------------|---------------|------------------|-------------|-----------|--------------|------|---|------|--------------|
| Perfluorooctanesulfonic acid (PFOS)  | 11            | J                | 131         | 146       |              | ng/L |   | 103  | 70 - 130     |
| Perfluorooctanoic acid (PFOA)        | 16            | J                | 65.8        | 79.2      |              | ng/L |   | 97   | 70 - 130     |
| Perfluorononanoic acid (PFNA)        | 21            | U                | 65.8        | 64.8      |              | ng/L |   | 99   | 70 - 130     |
| Perfluorohexanesulfonic acid (PFHxS) | 15            | J                | 99.8        | 118       |              | ng/L |   | 103  | 70 - 130     |
| Perfluoroheptanoic acid (PFHpA)      | 5.9           | J                | 31.9        | 34.3      |              | ng/L |   | 89   | 70 - 130     |
| Perfluorobutanesulfonic acid (PFBS)  | 37            | U                | 299         | 325       |              | ng/L |   | 109  | 70 - 130     |

| Surrogate  | MS %Recovery | MS Qualifier | Limits   |
|------------|--------------|--------------|----------|
| 13C2 PFHxA | 90           |              | 70 - 130 |
| 13C2 PFDA  | 98           |              | 70 - 130 |

TestAmerica Sacramento



# QC Sample Results

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

## Method: 537 - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: 320-41679-1 MSD

Matrix: Water

Analysis Batch: 238610

Client Sample ID: WGNA-073118-RW-3785

Prep Type: Total/NA

Prep Batch: 237969

| Analyte                              | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|--------------------------------------|---------------|------------------|-------------|------------|---------------|------|---|------|--------------|-----|-----------|
| Perfluorooctanesulfonic acid (PFOS)  | 11            | J                | 135         | 151        |               | ng/L |   | 104  | 70 - 130     | 3   | 30        |
| Perfluorooctanoic acid (PFOA)        | 16            | J                | 67.8        | 80.0       |               | ng/L |   | 95   | 70 - 130     | 1   | 30        |
| Perfluorononanoic acid (PFNA)        | 21            | U                | 67.8        | 65.2       |               | ng/L |   | 96   | 70 - 130     | 1   | 30        |
| Perfluorohexanesulfonic acid (PFHxS) | 15            | J                | 103         | 120        |               | ng/L |   | 103  | 70 - 130     | 2   | 30        |
| Perfluoroheptanoic acid (PFHpA)      | 5.9           | J                | 32.9        | 35.1       |               | ng/L |   | 89   | 70 - 130     | 2   | 30        |
| Perfluorobutanesulfonic acid (PFBS)  | 37            | U                | 308         | 335        |               | ng/L |   | 109  | 70 - 130     | 3   | 30        |
|                                      |               |                  |             |            |               |      |   |      |              |     |           |
| Surrogate                            | MSD %Recovery | MSD Qualifier    | Limits      |            |               |      |   |      |              |     |           |
| 13C2 PFHxA                           | 86            |                  | 70 - 130    |            |               |      |   |      |              |     |           |
| 13C2 PFDA                            | 99            |                  | 70 - 130    |            |               |      |   |      |              |     |           |

# QC Association Summary

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

## LCMS

### Prep Batch: 237969

| Lab Sample ID      | Client Sample ID     | Prep Type | Matrix | Method | Prep Batch |
|--------------------|----------------------|-----------|--------|--------|------------|
| 320-41679-1        | WGNA-073118-RW-3785  | Total/NA  | Water  | 537    |            |
| 320-41679-2        | WGNA-073118-FRB-3785 | Total/NA  | Water  | 537    |            |
| 320-41679-3        | NAWC-073118-RW-154   | Total/NA  | Water  | 537    |            |
| 320-41679-4        | NAWC-073118-FRB-154  | Total/NA  | Water  | 537    |            |
| 320-41679-5        | NAWC-073118-RW-185   | Total/NA  | Water  | 537    |            |
| 320-41679-6        | NAWC-073118-FRB-185  | Total/NA  | Water  | 537    |            |
| 320-41679-7        | NAWC-073118-RW-179   | Total/NA  | Water  | 537    |            |
| 320-41679-8        | NAWC-073118-FRB-179  | Total/NA  | Water  | 537    |            |
| 320-41679-9        | NAWC-073118-RW-124   | Total/NA  | Water  | 537    |            |
| 320-41679-10       | NAWC-073118-FRB-124  | Total/NA  | Water  | 537    |            |
| 320-41679-11       | WGNA-073118-RW-3103  | Total/NA  | Water  | 537    |            |
| 320-41679-12       | WGNA-073118-FRB-3103 | Total/NA  | Water  | 537    |            |
| MB 320-237969/1-A  | Method Blank         | Total/NA  | Water  | 537    |            |
| LCS 320-237969/2-A | Lab Control Sample   | Total/NA  | Water  | 537    |            |
| 320-41679-1 MS     | WGNA-073118-RW-3785  | Total/NA  | Water  | 537    |            |
| 320-41679-1 MSD    | WGNA-073118-RW-3785  | Total/NA  | Water  | 537    |            |

### Analysis Batch: 238610

| Lab Sample ID      | Client Sample ID     | Prep Type | Matrix | Method | Prep Batch |
|--------------------|----------------------|-----------|--------|--------|------------|
| 320-41679-1        | WGNA-073118-RW-3785  | Total/NA  | Water  | 537    | 237969     |
| 320-41679-2        | WGNA-073118-FRB-3785 | Total/NA  | Water  | 537    | 237969     |
| 320-41679-3        | NAWC-073118-RW-154   | Total/NA  | Water  | 537    | 237969     |
| 320-41679-4        | NAWC-073118-FRB-154  | Total/NA  | Water  | 537    | 237969     |
| 320-41679-5        | NAWC-073118-RW-185   | Total/NA  | Water  | 537    | 237969     |
| 320-41679-6        | NAWC-073118-FRB-185  | Total/NA  | Water  | 537    | 237969     |
| MB 320-237969/1-A  | Method Blank         | Total/NA  | Water  | 537    | 237969     |
| LCS 320-237969/2-A | Lab Control Sample   | Total/NA  | Water  | 537    | 237969     |
| 320-41679-1 MS     | WGNA-073118-RW-3785  | Total/NA  | Water  | 537    | 237969     |
| 320-41679-1 MSD    | WGNA-073118-RW-3785  | Total/NA  | Water  | 537    | 237969     |

### Analysis Batch: 238612

| Lab Sample ID | Client Sample ID     | Prep Type | Matrix | Method | Prep Batch |
|---------------|----------------------|-----------|--------|--------|------------|
| 320-41679-7   | NAWC-073118-RW-179   | Total/NA  | Water  | 537    | 237969     |
| 320-41679-8   | NAWC-073118-FRB-179  | Total/NA  | Water  | 537    | 237969     |
| 320-41679-9   | NAWC-073118-RW-124   | Total/NA  | Water  | 537    | 237969     |
| 320-41679-10  | NAWC-073118-FRB-124  | Total/NA  | Water  | 537    | 237969     |
| 320-41679-11  | WGNA-073118-RW-3103  | Total/NA  | Water  | 537    | 237969     |
| 320-41679-12  | WGNA-073118-FRB-3103 | Total/NA  | Water  | 537    | 237969     |

# Lab Chronicle

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

## Client Sample ID: WGNA-073118-RW-3785

Date Collected: 07/31/18 08:40

Date Received: 08/01/18 09:45

## Lab Sample ID: 320-41679-1

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 537          |     |                 | 237969       | 08/04/18 08:24       | SK      | TAL SAC |
| Total/NA  | Analysis   | 537          |     | 1               | 238610       | 08/08/18 04:50       | JRB     | TAL SAC |

## Client Sample ID: WGNA-073118-FRB-3785

Date Collected: 07/31/18 08:35

Date Received: 08/01/18 09:45

## Lab Sample ID: 320-41679-2

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 537          |     |                 | 237969       | 08/04/18 08:24       | SK      | TAL SAC |
| Total/NA  | Analysis   | 537          |     | 1               | 238610       | 08/08/18 05:04       | JRB     | TAL SAC |

## Client Sample ID: NAWC-073118-RW-154

Date Collected: 07/31/18 10:10

Date Received: 08/01/18 09:45

## Lab Sample ID: 320-41679-3

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 537          |     |                 | 237969       | 08/04/18 08:24       | SK      | TAL SAC |
| Total/NA  | Analysis   | 537          |     | 1               | 238610       | 08/08/18 05:09       | JRB     | TAL SAC |

## Client Sample ID: NAWC-073118-FRB-154

Date Collected: 07/31/18 10:05

Date Received: 08/01/18 09:45

## Lab Sample ID: 320-41679-4

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 537          |     |                 | 237969       | 08/04/18 08:24       | SK      | TAL SAC |
| Total/NA  | Analysis   | 537          |     | 1               | 238610       | 08/08/18 05:13       | JRB     | TAL SAC |

## Client Sample ID: NAWC-073118-RW-185

Date Collected: 07/31/18 11:10

Date Received: 08/01/18 09:45

## Lab Sample ID: 320-41679-5

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 537          |     |                 | 237969       | 08/04/18 08:24       | SK      | TAL SAC |
| Total/NA  | Analysis   | 537          |     | 1               | 238610       | 08/08/18 05:18       | JRB     | TAL SAC |

## Client Sample ID: NAWC-073118-FRB-185

Date Collected: 07/31/18 11:05

Date Received: 08/01/18 09:45

## Lab Sample ID: 320-41679-6

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 537          |     |                 | 237969       | 08/04/18 08:24       | SK      | TAL SAC |
| Total/NA  | Analysis   | 537          |     | 1               | 238610       | 08/08/18 05:23       | JRB     | TAL SAC |

TestAmerica Sacramento

# Lab Chronicle

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

**Client Sample ID: NAWC-073118-RW-179**

**Date Collected: 07/31/18 12:10**

**Date Received: 08/01/18 09:45**

**Lab Sample ID: 320-41679-7**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 537          |     |                 | 237969       | 08/04/18 08:24       | SK      | TAL SAC |
| Total/NA  | Analysis   | 537          |     | 1               | 238612       | 08/08/18 05:37       | JRB     | TAL SAC |

**Client Sample ID: NAWC-073118-FRB-179**

**Date Collected: 07/31/18 12:05**

**Date Received: 08/01/18 09:45**

**Lab Sample ID: 320-41679-8**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 537          |     |                 | 237969       | 08/04/18 08:24       | SK      | TAL SAC |
| Total/NA  | Analysis   | 537          |     | 1               | 238612       | 08/08/18 05:41       | JRB     | TAL SAC |

**Client Sample ID: NAWC-073118-RW-124**

**Date Collected: 07/31/18 12:40**

**Date Received: 08/01/18 09:45**

**Lab Sample ID: 320-41679-9**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 537          |     |                 | 237969       | 08/04/18 08:24       | SK      | TAL SAC |
| Total/NA  | Analysis   | 537          |     | 1               | 238612       | 08/08/18 05:46       | JRB     | TAL SAC |

**Client Sample ID: NAWC-073118-FRB-124**

**Date Collected: 07/31/18 12:35**

**Date Received: 08/01/18 09:45**

**Lab Sample ID: 320-41679-10**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 537          |     |                 | 237969       | 08/04/18 08:24       | SK      | TAL SAC |
| Total/NA  | Analysis   | 537          |     | 1               | 238612       | 08/08/18 05:51       | JRB     | TAL SAC |

**Client Sample ID: WGNA-073118-RW-3103**

**Date Collected: 07/31/18 13:40**

**Date Received: 08/01/18 09:45**

**Lab Sample ID: 320-41679-11**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 537          |     |                 | 237969       | 08/04/18 08:24       | SK      | TAL SAC |
| Total/NA  | Analysis   | 537          |     | 1               | 238612       | 08/08/18 05:55       | JRB     | TAL SAC |

**Client Sample ID: WGNA-073118-FRB-3103**

**Date Collected: 07/31/18 13:35**

**Date Received: 08/01/18 09:45**

**Lab Sample ID: 320-41679-12**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 537          |     |                 | 237969       | 08/04/18 08:24       | SK      | TAL SAC |
| Total/NA  | Analysis   | 537          |     | 1               | 238612       | 08/08/18 06:00       | JRB     | TAL SAC |

TestAmerica Sacramento

# Lab Chronicle

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

**Laboratory References:**

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

# Accreditation/Certification Summary

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

## Laboratory: TestAmerica Sacramento

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

| Authority          | Program       | EPA Region | Identification Number | Expiration Date |
|--------------------|---------------|------------|-----------------------|-----------------|
| Alaska (UST)       | State Program | 10         | 17-020                | 01-20-21        |
| ANAB               | DoD ELAP      |            | L2468                 | 01-20-21        |
| Arizona            | State Program | 9          | AZ0708                | 08-11-19        |
| Arkansas DEQ       | State Program | 6          | 88-0691               | 06-17-19        |
| California         | State Program | 9          | 2897                  | 01-31-19        |
| Colorado           | State Program | 8          | CA00044               | 08-31-19        |
| Connecticut        | State Program | 1          | PH-0691               | 06-30-19        |
| Florida            | NELAP         | 4          | E87570                | 06-30-19        |
| Georgia            | State Program | 4          | N/A                   | 01-28-19        |
| Hawaii             | State Program | 9          | N/A                   | 01-29-19        |
| Illinois           | NELAP         | 5          | 200060                | 03-17-19        |
| Kansas             | NELAP         | 7          | E-10375               | 10-31-18        |
| Louisiana          | NELAP         | 6          | 30612                 | 06-30-19        |
| Maine              | State Program | 1          | CA0004                | 04-14-20        |
| Michigan           | State Program | 5          | 9947                  | 01-31-20        |
| Nevada             | State Program | 9          | CA00044               | 07-31-19        |
| New Hampshire      | NELAP         | 1          | 2997                  | 04-18-19        |
| New Jersey         | NELAP         | 2          | CA005                 | 06-30-19        |
| New York           | NELAP         | 2          | 11666                 | 03-31-19        |
| Oregon             | NELAP         | 10         | 4040                  | 01-29-19        |
| Pennsylvania       | NELAP         | 3          | 68-01272              | 03-31-19        |
| Texas              | NELAP         | 6          | T104704399            | 05-31-19        |
| US Fish & Wildlife | Federal       |            | LE148388-0            | 07-31-19        |
| USDA               | Federal       |            | P330-18-00239         | 01-17-21        |
| USEPA UCMR         | Federal       | 1          | CA00044               | 11-06-18        |
| Utah               | NELAP         | 8          | CA00044               | 02-28-19        |
| Vermont            | State Program | 1          | VT-4040               | 04-30-19        |
| Virginia           | NELAP         | 3          | 460278                | 03-14-19        |
| Washington         | State Program | 10         | C581                  | 05-05-19        |
| West Virginia (DW) | State Program | 3          | 9930C                 | 12-31-18        |
| Wyoming            | State Program | 8          | 8TMS-L                | 01-28-19        |

# Method Summary

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

| Method | Method Description                       | Protocol | Laboratory |
|--------|------------------------------------------|----------|------------|
| 537    | Perfluorinated Alkyl Acids (LC/MS)       | EPA      | TAL SAC    |
| 537    | Extraction of Perfluorinated Alkyl Acids | EPA      | TAL SAC    |

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

## Sample Summary

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

| Lab Sample ID | Client Sample ID     | Matrix | Collected      | Received       |
|---------------|----------------------|--------|----------------|----------------|
| 320-41679-1   | WGNA-073118-RW-3785  | Water  | 07/31/18 08:40 | 08/01/18 09:45 |
| 320-41679-2   | WGNA-073118-FRB-3785 | Water  | 07/31/18 08:35 | 08/01/18 09:45 |
| 320-41679-3   | NAWC-073118-RW-154   | Water  | 07/31/18 10:10 | 08/01/18 09:45 |
| 320-41679-4   | NAWC-073118-FRB-154  | Water  | 07/31/18 10:05 | 08/01/18 09:45 |
| 320-41679-5   | NAWC-073118-RW-185   | Water  | 07/31/18 11:10 | 08/01/18 09:45 |
| 320-41679-6   | NAWC-073118-FRB-185  | Water  | 07/31/18 11:05 | 08/01/18 09:45 |
| 320-41679-7   | NAWC-073118-RW-179   | Water  | 07/31/18 12:10 | 08/01/18 09:45 |
| 320-41679-8   | NAWC-073118-FRB-179  | Water  | 07/31/18 12:05 | 08/01/18 09:45 |
| 320-41679-9   | NAWC-073118-RW-124   | Water  | 07/31/18 12:40 | 08/01/18 09:45 |
| 320-41679-10  | NAWC-073118-FRB-124  | Water  | 07/31/18 12:35 | 08/01/18 09:45 |
| 320-41679-11  | WGNA-073118-RW-3103  | Water  | 07/31/18 13:40 | 08/01/18 09:45 |
| 320-41679-12  | WGNA-073118-FRB-3103 | Water  | 07/31/18 13:35 | 08/01/18 09:45 |



## LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Analysis Batch Number: 238612Lab Sample ID: 320-41679-11 Client Sample ID: WGNA-073118-RW-3103Date Analyzed: 08/08/18 05:55 Lab File ID: 2018.08.07\_537C\_039.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                       | RETENTION<br>TIME | MANUAL INTEGRATION        |          |                |
|-------------------------------------|-------------------|---------------------------|----------|----------------|
|                                     |                   | REASON                    | ANALYST  | DATE           |
| Perfluorobutanesulfonic acid (PFBS) | 1.34              | Peak assignment corrected | barnettj | 08/08/18 13:47 |
| Perfluoroheptanoic acid (PFHpA)     | 1.59              | Missed Peak               | barnettj | 08/08/18 13:47 |

## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

| Reagent ID             | Exp Date | Prep Date                               | Dilutant Used                     | Reagent Final Volume | Parent Reagent      |              | Analyte                              | Concentration  |
|------------------------|----------|-----------------------------------------|-----------------------------------|----------------------|---------------------|--------------|--------------------------------------|----------------|
|                        |          |                                         |                                   |                      | Reagent ID          | Volume Added |                                      |                |
| <b>LC537-ICV_00032</b> | 08/15/18 | 06/23/18                                | MeOH/H <sub>2</sub> O, Lot 197626 | 10 mL                | LC537-IS_00074      | 1000 uL      | 13C2-PFOA                            | 10 ng/mL       |
| .LC537-IS_00074        | 12/16/18 | 06/16/18                                | Methanol, Lot 090285              | 30000 uL             | LCM2PFOA_00010      | 60 uL        | 13C2-PFOA                            | 0.1 ug/mL      |
|                        |          |                                         |                                   |                      | LCMPFOS_00024       | 180 uL       | 13C4 PFOS                            | 0.2868 ug/mL   |
| ..LCM2PFOA_00010       | 02/12/21 | Wellington Laboratories, Lot M2PFOA0216 |                                   |                      | (Purchased Reagent) |              | 13C2-PFOA                            | 50 ug/mL       |
| ..LCMPFOS_00024        | 05/19/22 | Wellington Laboratories, Lot MPFOS517   |                                   |                      | (Purchased Reagent) |              | 13C4 PFOS                            | 47.8 ug/mL     |
| <b>LC537-ICV_00032</b> | 08/15/18 | 06/23/18                                | MeOH/H <sub>2</sub> O, Lot 197626 | 10 mL                | LC537-SU_00072      | 1000 uL      | 13C2 PFDA                            | 10 ng/mL       |
|                        |          |                                         |                                   |                      | LC537ICIM2_00001    | 400 uL       | 13C2 PFHxA                           | 10 ng/mL       |
|                        |          |                                         |                                   |                      |                     |              | Perfluorobutanesulfonic acid (PFBS)  | 100.092 ng/mL  |
|                        |          |                                         |                                   |                      |                     |              | Perfluoroheptanoic acid (PFHpA)      | 10 ng/mL       |
|                        |          |                                         |                                   |                      |                     |              | Perfluorohexanesulfonic acid (PFHxS) | 20.1619 ng/mL  |
|                        |          |                                         |                                   |                      |                     |              | Perfluorononanoic acid (PFNA)        | 20.1641 ng/mL  |
|                        |          |                                         |                                   |                      |                     |              | Perfluorooctanoic acid (PFOA)        | 20.167 ng/mL   |
|                        |          |                                         |                                   |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)  | 20.1702 ng/mL  |
| .LC537-SU_00072        | 12/16/18 | 06/16/18                                | Methanol, Lot 104453              | 30000 uL             | LCMPFDA_00012       | 60 uL        | 13C2 PFDA                            | 0.1 ug/mL      |
|                        |          |                                         |                                   |                      | LCMPFHxA_00015      | 60 uL        | 13C2 PFHxA                           | 0.1 ug/mL      |
| ..LCMPFDA_00012        | 09/30/21 | Wellington Laboratories, Lot MPFDA0916  |                                   |                      | (Purchased Reagent) |              | 13C2 PFDA                            | 50 ug/mL       |
| ..LCMPFHxA_00015       | 11/22/21 | Wellington Laboratories, Lot MPFHxA1116 |                                   |                      | (Purchased Reagent) |              | 13C2 PFHxA                           | 50 ug/mL       |
| .LC537ICIM2_00001      | 08/15/18 | 02/15/18                                | Methanol, Lot 090285              | 10 mL                | LC537ICIM_00020     | 0.5 mL       | Perfluorobutanesulfonic acid (PFBS)  | 2.5023 ug/mL   |
|                        |          |                                         |                                   |                      |                     |              | Perfluoroheptanoic acid (PFHpA)      | 0.25 ug/mL     |
|                        |          |                                         |                                   |                      |                     |              | Perfluorohexanesulfonic acid (PFHxS) | 0.504047 ug/mL |
|                        |          |                                         |                                   |                      |                     |              | Perfluorononanoic acid (PFNA)        | 0.504103 ug/mL |
|                        |          |                                         |                                   |                      |                     |              | Perfluorooctanoic acid (PFOA)        | 0.504176 ug/mL |
|                        |          |                                         |                                   |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)  | 0.504255 ug/mL |
| ..LC537ICIM_00020      | 08/15/18 | 02/15/18                                | Methanol, Lot 090285              | 25 mL                | LC537-PFBS2_00009   | 0.625 mL     | Perfluorobutanesulfonic acid (PFBS)  | 50.0459 ug/mL  |
|                        |          |                                         |                                   |                      | LC537-PFHxA2_00012  | 0.0625 mL    | Perfluoroheptanoic acid (PFHpA)      | 5 ug/mL        |
|                        |          |                                         |                                   |                      | LC537-PFHxS2_00009  | 0.126 mL     | Perfluorohexanesulfonic acid (PFHxS) | 10.0809 ug/mL  |
|                        |          |                                         |                                   |                      | LC537-PFNA2_00010   | 0.126 mL     | Perfluorononanoic acid (PFNA)        | 10.0821 ug/mL  |
|                        |          |                                         |                                   |                      | LC537-PFOA2_00011   | 0.126 mL     | Perfluorooctanoic acid (PFOA)        | 10.0835 ug/mL  |
|                        |          |                                         |                                   |                      | LC537-PFOS2_00011   | 0.126 mL     | Perfluorooctanesulfonic acid (PFOS)  | 10.0851 ug/mL  |
| ...LC537-PFBS2_00009   | 08/15/18 | 02/15/18                                | Methanol, Lot 090285              | 17.1 mL              | LC537_PFBS2_00002   | 0.0343 g     | Perfluorobutanesulfonic acid (PFBS)  | 2001.84 ug/mL  |
| ....LC537_PFBS2_00002  | 09/08/22 | Santa Cruz Biotechnology, Lot F0917     |                                   |                      | (Purchased Reagent) |              | Perfluorobutanesulfonic acid (PFBS)  | 0.998 g/g      |

# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

| Reagent ID             | Exp Date | Prep Date                               | Dilutant Used        | Reagent Final Volume | Parent Reagent      |              | Analyte                              | Concentration        |
|------------------------|----------|-----------------------------------------|----------------------|----------------------|---------------------|--------------|--------------------------------------|----------------------|
|                        |          |                                         |                      |                      | Reagent ID          | Volume Added |                                      |                      |
| ...LC537-PFHpA2_00012  | 08/15/18 | 02/15/18                                | Methanol, Lot 09092  | 23.95 mL             | LC537_PFHpA2_00002  | 0.0479 g     | Perfluoroheptanoic acid (PFHpA)      | 2000 ug/mL           |
| ....LC537_PFHpA2_00002 | 06/13/22 | Afla Aesar, Lot 10200390                |                      |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid (PFHpA)      | 1 g/g                |
| ...LC537-PFHxS2_00009  | 08/15/18 | 02/15/18                                | Methanol, Lot 090285 | 25.87 mL             | LC537_PFHxS2_00002  | 0.0569 g     | Perfluorohexanesulfonic acid (PFHxS) | 2000.19 ug/mL        |
| ....LC537_PFHxS2_00002 | 06/08/22 | Santa Cruz Biotechnology, Lot G2516     |                      |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid (PFHxS) | 0.9094 g/g           |
| ...LC537-PFNA2_00010   | 08/15/18 | 02/15/18                                | Methanol, Lot 090285 | 16.58 mL             | LC537_PFNA2_00002   | 0.0333 g     | Perfluorononanoic acid (PFNA)        | 2000.41 ug/mL        |
| ....LC537_PFNA2_00002  | 06/14/22 | Aldrich, Lot MKCC0699                   |                      |                      | (Purchased Reagent) |              | Perfluorononanoic acid (PFNA)        | 0.996 g/g            |
| ...LC537-PFOA2_00011   | 08/15/18 | 02/15/18                                | Methanol, Lot 090285 | 22.96 mL             | LC537_PFOA2_00002   | 0.0464 g     | Perfluorooctanoic acid (PFOA)        | 2000.7 ug/mL         |
| ....LC537_PFOA2_00002  | 06/09/22 | Afla Aesar, Lot 10199078                |                      |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)        | 0.99 g/g             |
| ...LC537-PFOS2_00011   | 08/15/18 | 02/15/18                                | Methanol, Lot 090285 | 14.71 mL             | LC537_PFOS2_00002   | 0.0378 g     | Perfluorooctanesulfonic acid (PFOS)  | 2001.01 ug/mL        |
| ....LC537_PFOS2_00002  | 06/14/22 | Sigma, Lot BCBQ0108V                    |                      |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS)  | 0.7787 g/g           |
| LC537-IS_00077         | 01/05/19 | 07/16/18                                | Methanol, Lot 090285 | 30000 uL             | LCM2PFOA_00010      | 60 uL        | 13C2-PFOA                            | 0.1 ug/mL            |
| .LCM2PFOA_00010        | 02/12/21 | Wellington Laboratories, Lot M2PFOA0216 |                      |                      | LCMPFOS_00024       | 180 uL       | 13C4 PFOS                            | 0.2868 ug/mL         |
| .LCMPFOS_00024         | 05/19/22 | Wellington Laboratories, Lot MPFOS517   |                      |                      | (Purchased Reagent) |              | 13C2-PFOA                            | 50 ug/mL             |
|                        |          |                                         |                      |                      | (Purchased Reagent) |              | 13C4 PFOS                            | 47.8 ug/mL           |
| LC537-L1_00022         | 09/30/18 | 04/02/18                                | MeOH/H2O, Lot 090285 | 5 mL                 | LC537-IS_00065      | 500 uL       | 13C2-PFOA                            | 10 ng/mL             |
|                        |          |                                         |                      |                      | LC537-MSP_00033     | 60 uL        | 13C4 PFOS                            | 28.68 ng/mL          |
|                        |          |                                         |                      |                      |                     |              | Perfluorobutanesulfonic acid (PFBS)  | 8.99912 ng/mL        |
|                        |          |                                         |                      |                      |                     |              | Perfluoroheptanoic acid (PFHpA)      | 0.96 ng/mL           |
|                        |          |                                         |                      |                      |                     |              | Perfluorohexanesulfonic acid (PFHxS) | 3.003 ng/mL          |
|                        |          |                                         |                      |                      |                     |              | Perfluorononanoic acid (PFNA)        | 1.98 ng/mL           |
|                        |          |                                         |                      |                      |                     |              | Perfluorooctanoic acid (PFOA)        | 1.98 ng/mL           |
|                        |          |                                         |                      |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)  | 3.95328 ng/mL        |
|                        |          |                                         |                      |                      | LC537-SU_00064      | 500 uL       | 13C2 PFDA                            | 10 ng/mL             |
|                        |          |                                         |                      |                      | .LC537-IS_00065     | 10/02/18     | 04/02/18                             | Methanol, Lot 090285 |
| LCMPFOS_00024          | 180 uL   | 13C4 PFOS                               | 0.2868 ug/mL         |                      |                     |              |                                      |                      |
| ..LCM2PFOA_00010       | 02/12/21 | Wellington Laboratories, Lot M2PFOA0216 |                      |                      | (Purchased Reagent) |              | 13C2-PFOA                            | 50 ug/mL             |
| ..LCMPFOS_00024        | 05/19/22 | Wellington Laboratories, Lot MPFOS517   |                      |                      | (Purchased Reagent) |              | 13C4 PFOS                            | 47.8 ug/mL           |
| .LC537-MSP_00033       | 09/30/18 | 03/30/18                                | Methanol, Lot 104453 | 30 mL                | LCPFBSA_00002       | 509 uL       | Perfluorobutanesulfonic acid (PFBS)  | 749.927 ng/mL        |
|                        |          |                                         |                      |                      | LCPFHpA_00009       | 48 uL        | Perfluoroheptanoic acid (PFHpA)      | 80 ng/mL             |
|                        |          |                                         |                      |                      | LCPFHxS-br_00005    | 165 uL       | Perfluorohexanesulfonic acid (PFHxS) | 250.25 ng/mL         |
|                        |          |                                         |                      |                      | LCPFNA_00009        | 99 uL        | Perfluorononanoic acid (PFNA)        | 165 ng/mL            |
|                        |          |                                         |                      |                      | LCPFOA_00010        | 99 uL        | Perfluorooctanoic acid (PFOA)        | 165 ng/mL            |
|                        |          |                                         |                      |                      | LCPFOS-br_00005     | 213 uL       | Perfluorooctanesulfonic acid (PFOS)  | 329.44 ng/mL         |

# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

| Reagent ID         | Exp Date | Prep Date                                 | Dilutant Used        | Reagent Final Volume | Parent Reagent      |              | Analyte                              | Concentration |                                      |               |
|--------------------|----------|-------------------------------------------|----------------------|----------------------|---------------------|--------------|--------------------------------------|---------------|--------------------------------------|---------------|
|                    |          |                                           |                      |                      | Reagent ID          | Volume Added |                                      |               |                                      |               |
| ..LCPFBSA_00002    | 12/02/21 | Wellington Laboratories, Lot LPFBS1116    |                      |                      | (Purchased Reagent) |              | Perfluorobutanesulfonic acid (PFBS)  | 44.2 ug/mL    |                                      |               |
| ..LCPFHpA_00009    | 12/02/21 | Wellington Laboratories, Lot PFHpA1216    |                      |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid (PFHpA)      | 50 ug/mL      |                                      |               |
| ..LCPFHxS-br_00005 | 01/04/22 | Wellington Laboratories, Lot brPFHxSK0117 |                      |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid (PFHxS) | 45.5 ug/mL    |                                      |               |
| ..LCPFNA 00009     | 07/20/22 | Wellington Laboratories, Lot PFNA0717     |                      |                      | (Purchased Reagent) |              | Perfluorononanoic acid (PFNA)        | 50 ug/mL      |                                      |               |
| ..LCPFOA 00010     | 09/27/22 | Wellington Laboratories, Lot PFOA0917     |                      |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)        | 50 ug/mL      |                                      |               |
| ..LCPFOS-br_00005  | 01/12/22 | Wellington Laboratories, Lot brPFOSK0117  |                      |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS)  | 46.4 ug/mL    |                                      |               |
| .LC537-SU_00064    | 10/02/18 | 04/02/18                                  | Methanol, Lot 104453 | 30000 uL             | LCMPFDA_00012       | 60 uL        | 13C2 PFDA                            | 0.1 ug/mL     |                                      |               |
|                    |          |                                           |                      |                      | LCMPFHxA_00015      | 60 uL        | 13C2 PFHxA                           | 0.1 ug/mL     |                                      |               |
| ..LCMPFDA_00012    | 09/30/21 | Wellington Laboratories, Lot MPFDA0916    |                      |                      | (Purchased Reagent) |              | 13C2 PFDA                            | 50 ug/mL      |                                      |               |
| ..LCMPFHxA_00015   | 11/22/21 | Wellington Laboratories, Lot MPFHxA1116   |                      |                      | (Purchased Reagent) |              | 13C2 PFHxA                           | 50 ug/mL      |                                      |               |
| LC537-L2_00022     | 09/30/18 | 04/02/18                                  | MeOH/H2O, Lot 090285 | 20 mL                | LC537-HSP_00028     | 320 uL       | Perfluorobutanesulfonic acid (PFBS)  | 20.0138 ng/mL |                                      |               |
|                    |          |                                           |                      |                      |                     |              | Perfluoroheptanoic acid (PFHpA)      | 2.16 ng/mL    |                                      |               |
|                    |          |                                           |                      |                      |                     |              | Perfluorohexanesulfonic acid (PFHxS) | 6.72187 ng/mL |                                      |               |
|                    |          |                                           |                      |                      |                     |              | Perfluorononanoic acid (PFNA)        | 4.4 ng/mL     |                                      |               |
|                    |          |                                           |                      |                      |                     |              | Perfluorooctanoic acid (PFOA)        | 4.4 ng/mL     |                                      |               |
|                    |          |                                           |                      |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)  | 8.78507 ng/mL |                                      |               |
|                    |          |                                           |                      |                      | LC537-IS_00065      | 2 mL         | 13C2-PFOA                            | 10 ng/mL      |                                      |               |
|                    |          |                                           |                      |                      |                     |              | 13C4 PFOS                            | 28.68 ng/mL   |                                      |               |
| .LC537-HSP_00028   | 09/30/18 | 03/30/18                                  | Methanol, Lot 104453 | 30 mL                | LC537-SU_00064      | 2 mL         | 13C2 PFDA                            | 10 ng/mL      |                                      |               |
|                    |          |                                           |                      |                      |                     |              | 13C2 PFHxA                           | 10 ng/mL      |                                      |               |
|                    |          |                                           |                      |                      |                     |              | LCPFBSA_00002                        | 849 uL        | Perfluorobutanesulfonic acid (PFBS)  | 1250.86 ng/mL |
|                    |          |                                           |                      |                      |                     |              | LCPFHpA_00009                        | 81 uL         | Perfluoroheptanoic acid (PFHpA)      | 135 ng/mL     |
|                    |          |                                           |                      |                      |                     |              | LCPFHxS-br_00005                     | 277 uL        | Perfluorohexanesulfonic acid (PFHxS) | 420.117 ng/mL |
|                    |          |                                           |                      |                      |                     |              | LCPFNA 00009                         | 165 uL        | Perfluorononanoic acid (PFNA)        | 275 ng/mL     |
| LCPFOA 00010       | 165 uL   | Perfluorooctanoic acid (PFOA)             | 275 ng/mL            |                      |                     |              |                                      |               |                                      |               |
| LCPFOS-br_00005    | 355 uL   | Perfluorooctanesulfonic acid (PFOS)       | 549.067 ng/mL        |                      |                     |              |                                      |               |                                      |               |
| ..LCPFBSA_00002    | 12/02/21 | Wellington Laboratories, Lot LPFBS1116    |                      |                      | (Purchased Reagent) |              | Perfluorobutanesulfonic acid (PFBS)  | 44.2 ug/mL    |                                      |               |
| ..LCPFHpA_00009    | 12/02/21 | Wellington Laboratories, Lot PFHpA1216    |                      |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid (PFHpA)      | 50 ug/mL      |                                      |               |
| ..LCPFHxS-br_00005 | 01/04/22 | Wellington Laboratories, Lot brPFHxSK0117 |                      |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid (PFHxS) | 45.5 ug/mL    |                                      |               |
| ..LCPFNA 00009     | 07/20/22 | Wellington Laboratories, Lot PFNA0717     |                      |                      | (Purchased Reagent) |              | Perfluorononanoic acid (PFNA)        | 50 ug/mL      |                                      |               |
| ..LCPFOA 00010     | 09/27/22 | Wellington Laboratories, Lot PFOA0917     |                      |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)        | 50 ug/mL      |                                      |               |
| ..LCPFOS-br_00005  | 01/12/22 | Wellington Laboratories, Lot brPFOSK0117  |                      |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS)  | 46.4 ug/mL    |                                      |               |
| .LC537-IS_00065    | 10/02/18 | 04/02/18                                  | Methanol, Lot 090285 | 30000 uL             | LCM2PFOA_00010      | 60 uL        | 13C2-PFOA                            | 0.1 ug/mL     |                                      |               |

# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

| Reagent ID         | Exp Date | Prep Date | Dilutant Used                             | Reagent Final Volume | Parent Reagent      |              | Analyte                              | Concentration |
|--------------------|----------|-----------|-------------------------------------------|----------------------|---------------------|--------------|--------------------------------------|---------------|
|                    |          |           |                                           |                      | Reagent ID          | Volume Added |                                      |               |
| ..LCM2PFOA_00010   | 02/12/21 |           | Wellington Laboratories, Lot M2PFOA0216   |                      | LCMPFOS_00024       | 180 uL       | 13C4 PFOS                            | 0.2868 ug/mL  |
| ..LCMPFOS_00024    | 05/19/22 |           | Wellington Laboratories, Lot MPFOS517     |                      | (Purchased Reagent) |              | 13C2-PFOA                            | 50 ug/mL      |
| ..LC537-SU_00064   | 10/02/18 | 04/02/18  | Methanol, Lot 104453                      | 30000 uL             | LCMPFDA_00012       | 60 uL        | 13C4 PFOS                            | 47.8 ug/mL    |
| ..LCMPFDA_00012    | 09/30/21 |           | Wellington Laboratories, Lot MPFDA0916    |                      | LCMPFHxA_00015      | 60 uL        | 13C2 PFDA                            | 0.1 ug/mL     |
| ..LCMPFHxA_00015   | 11/22/21 |           | Wellington Laboratories, Lot MPFHxA1116   |                      | (Purchased Reagent) |              | 13C2 PFHxA                           | 0.1 ug/mL     |
| ..LCMPFHxA_00015   | 11/22/21 |           | Wellington Laboratories, Lot MPFHxA1116   |                      | (Purchased Reagent) |              | 13C2 PFDA                            | 50 ug/mL      |
| ..LCMPFHxA_00015   | 11/22/21 |           | Wellington Laboratories, Lot MPFHxA1116   |                      | (Purchased Reagent) |              | 13C2 PFHxA                           | 50 ug/mL      |
| LC537-L3_00025     | 09/30/18 | 04/02/18  | MeOH/H2O, Lot 090285                      | 20 mL                | LC537-HSP_00028     | 720 uL       | Perfluorobutanesulfonic acid (PFBS)  | 45.031 ng/mL  |
|                    |          |           |                                           |                      |                     |              | Perfluoroheptanoic acid (PFHpA)      | 4.86 ng/mL    |
|                    |          |           |                                           |                      |                     |              | Perfluorohexanesulfonic acid (PFHxS) | 15.1242 ng/mL |
|                    |          |           |                                           |                      |                     |              | Perfluorononanoic acid (PFNA)        | 9.9 ng/mL     |
|                    |          |           |                                           |                      |                     |              | Perfluorooctanoic acid (PFOA)        | 9.9 ng/mL     |
|                    |          |           |                                           |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)  | 19.7664 ng/mL |
|                    |          |           |                                           |                      | LC537-IS_00065      | 2 mL         | 13C2-PFOA                            | 10 ng/mL      |
|                    |          |           |                                           |                      |                     |              | 13C4 PFOS                            | 28.68 ng/mL   |
|                    |          |           |                                           |                      | LC537-SU_00064      | 2 mL         | 13C2 PFDA                            | 10 ng/mL      |
|                    |          |           |                                           |                      |                     |              | 13C2 PFHxA                           | 10 ng/mL      |
| ..LC537-HSP_00028  | 09/30/18 | 03/30/18  | Methanol, Lot 104453                      | 30 mL                | ..LCPFBSA_00002     | 849 uL       | Perfluorobutanesulfonic acid (PFBS)  | 1250.86 ng/mL |
|                    |          |           |                                           |                      | ..LCPFHxA_00009     | 81 uL        | Perfluoroheptanoic acid (PFHpA)      | 135 ng/mL     |
|                    |          |           |                                           |                      | ..LCPFHxS-br_00005  | 277 uL       | Perfluorohexanesulfonic acid (PFHxS) | 420.117 ng/mL |
|                    |          |           |                                           |                      | ..LCPFNA_00009      | 165 uL       | Perfluorononanoic acid (PFNA)        | 275 ng/mL     |
|                    |          |           |                                           |                      | ..LCPFOA_00010      | 165 uL       | Perfluorooctanoic acid (PFOA)        | 275 ng/mL     |
|                    |          |           |                                           |                      | ..LCPFOS-br_00005   | 355 uL       | Perfluorooctanesulfonic acid (PFOS)  | 549.067 ng/mL |
| ..LCPFBSA_00002    | 12/02/21 |           | Wellington Laboratories, Lot LPPFBS1116   |                      | (Purchased Reagent) |              | Perfluorobutanesulfonic acid (PFBS)  | 44.2 ug/mL    |
| ..LCPFHxA_00009    | 12/02/21 |           | Wellington Laboratories, Lot PFHpA1216    |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid (PFHpA)      | 50 ug/mL      |
| ..LCPFHxS-br_00005 | 01/04/22 |           | Wellington Laboratories, Lot brPFHxSK0117 |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid (PFHxS) | 45.5 ug/mL    |
| ..LCPFNA_00009     | 07/20/22 |           | Wellington Laboratories, Lot PFNA0717     |                      | (Purchased Reagent) |              | Perfluorononanoic acid (PFNA)        | 50 ug/mL      |
| ..LCPFOA_00010     | 09/27/22 |           | Wellington Laboratories, Lot PFOA0917     |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)        | 50 ug/mL      |
| ..LCPFOS-br_00005  | 01/12/22 |           | Wellington Laboratories, Lot brPFOSK0117  |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS)  | 46.4 ug/mL    |
| ..LC537-IS_00065   | 10/02/18 | 04/02/18  | Methanol, Lot 090285                      | 30000 uL             | LCM2PFOA_00010      | 60 uL        | 13C2-PFOA                            | 0.1 ug/mL     |
| ..LCM2PFOA_00010   | 02/12/21 |           | Wellington Laboratories, Lot M2PFOA0216   |                      | LCMPFOS_00024       | 180 uL       | 13C4 PFOS                            | 0.2868 ug/mL  |
| ..LCMPFOS_00024    | 05/19/22 |           | Wellington Laboratories, Lot MPFOS517     |                      | (Purchased Reagent) |              | 13C2-PFOA                            | 50 ug/mL      |
| ..LC537-SU_00064   | 10/02/18 | 04/02/18  | Methanol, Lot 104453                      | 30000 uL             | (Purchased Reagent) |              | 13C4 PFOS                            | 47.8 ug/mL    |
| ..LCMPFDA_00012    | 09/30/21 |           | Wellington Laboratories, Lot MPFDA0916    |                      | LCMPFDA_00012       | 60 uL        | 13C2 PFDA                            | 0.1 ug/mL     |
| ..LCMPFHxA_00015   | 11/22/21 |           | Wellington Laboratories, Lot MPFHxA1116   |                      | LCMPFHxA_00015      | 60 uL        | 13C2 PFHxA                           | 0.1 ug/mL     |
| ..LCMPFHxA_00015   | 11/22/21 |           | Wellington Laboratories, Lot MPFHxA1116   |                      | (Purchased Reagent) |              | 13C2 PFDA                            | 50 ug/mL      |
| ..LCMPFHxA_00015   | 11/22/21 |           | Wellington Laboratories, Lot MPFHxA1116   |                      | (Purchased Reagent) |              | 13C2 PFHxA                           | 50 ug/mL      |

## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

| Reagent ID            | Exp Date | Prep Date                               | Dilutant Used        | Reagent Final Volume | Parent Reagent   |              | Analyte                              | Concentration |
|-----------------------|----------|-----------------------------------------|----------------------|----------------------|------------------|--------------|--------------------------------------|---------------|
|                       |          |                                         |                      |                      | Reagent ID       | Volume Added |                                      |               |
| <b>LC537-L4_00022</b> | 09/30/18 | 04/02/18                                | MeOH/H2O, Lot 090285 | 5 mL                 | LC537-HSP_00028  | 360 uL       | Perfluorobutanesulfonic acid (PFBS)  | 90.0619 ng/mL |
|                       |          |                                         |                      |                      |                  |              | Perfluoroheptanoic acid (PFHpA)      | 9.72 ng/mL    |
|                       |          |                                         |                      |                      |                  |              | Perfluorohexanesulfonic acid (PFHxS) | 30.2484 ng/mL |
|                       |          |                                         |                      |                      |                  |              | Perfluorononanoic acid (PFNA)        | 19.8 ng/mL    |
|                       |          |                                         |                      |                      |                  |              | Perfluorooctanoic acid (PFOA)        | 19.8 ng/mL    |
|                       |          |                                         |                      |                      |                  |              | Perfluorooctanesulfonic acid (PFOS)  | 39.5328 ng/mL |
|                       |          |                                         |                      |                      | LC537-IS_00065   | 500 uL       | 13C2-PFOA                            | 10 ng/mL      |
| .LC537-HSP_00028      | 09/30/18 | 03/30/18                                | Methanol, Lot 104453 | 30 mL                | LCPFBSA_00002    | 849 uL       | 13C4 PFOS                            | 28.68 ng/mL   |
|                       |          |                                         |                      |                      |                  |              | 13C2 PFDA                            | 10 ng/mL      |
|                       |          |                                         |                      |                      |                  |              | 13C2 PFHxA                           | 10 ng/mL      |
|                       |          |                                         |                      |                      |                  |              | Perfluorobutanesulfonic acid (PFBS)  | 1250.86 ng/mL |
|                       |          |                                         |                      |                      |                  |              | Perfluoroheptanoic acid (PFHpA)      | 135 ng/mL     |
|                       |          |                                         |                      |                      | LCPFHxS-br_00005 | 277 uL       | Perfluorohexanesulfonic acid (PFHxS) | 420.117 ng/mL |
|                       |          |                                         |                      |                      | LCPFNA_00009     | 165 uL       | Perfluorononanoic acid (PFNA)        | 275 ng/mL     |
| ..LCPFOS-br_00005     | 12/02/21 | Wellington Laboratories, Lot LPPFBS1116 | (Purchased Reagent)  | 30 mL                | LCPFOA_00010     | 165 uL       | Perfluorooctanoic acid (PFOA)        | 275 ng/mL     |
|                       |          |                                         |                      |                      |                  |              | Perfluorooctanesulfonic acid (PFOS)  | 549.067 ng/mL |
|                       |          |                                         |                      |                      |                  |              | Perfluorobutanesulfonic acid (PFBS)  | 44.2 ug/mL    |
|                       |          |                                         |                      |                      |                  |              | Perfluoroheptanoic acid (PFHpA)      | 50 ug/mL      |
|                       |          |                                         |                      |                      |                  |              | Perfluorohexanesulfonic acid (PFHxS) | 45.5 ug/mL    |
| ..LCMPFOS_00024       | 05/19/22 | Wellington Laboratories, Lot MPFOS517   | (Purchased Reagent)  | 30 mL                | LCMPFOS_00024    | 180 uL       | Perfluorononanoic acid (PFNA)        | 50 ug/mL      |
|                       |          |                                         |                      |                      |                  |              | Perfluorooctanoic acid (PFOA)        | 50 ug/mL      |
|                       |          |                                         |                      |                      |                  |              | Perfluorooctanesulfonic acid (PFOS)  | 46.4 ug/mL    |
|                       |          |                                         |                      |                      |                  |              | 13C2-PFOA                            | 0.1 ug/mL     |
|                       |          |                                         |                      |                      |                  |              | 13C4 PFOS                            | 0.2868 ug/mL  |
| ..LCMPFDA_00012       | 09/30/21 | Wellington Laboratories, Lot MPFDA0916  | (Purchased Reagent)  | 30 mL                | LCMPFDA_00012    | 60 uL        | 13C2 PFDA                            | 50 ug/mL      |
|                       |          |                                         |                      |                      |                  |              | 13C2 PFHxA                           | 50 ug/mL      |
|                       |          |                                         |                      |                      |                  |              | Perfluorobutanesulfonic acid (PFBS)  | 135.093 ng/mL |
|                       |          |                                         |                      |                      |                  |              | Perfluoroheptanoic acid (PFHpA)      | 14.58 ng/mL   |
|                       |          |                                         |                      |                      |                  |              | Perfluorohexanesulfonic acid (PFHxS) | 45.3726 ng/mL |
| ..LCMPFHxA_00015      | 11/22/21 | Wellington Laboratories, Lot MPFHxA1116 | (Purchased Reagent)  | 20 mL                | LCMPFHxA_00015   | 60 uL        | Perfluorononanoic acid (PFNA)        | 29.7 ng/mL    |
|                       |          |                                         |                      |                      |                  |              | Perfluorobutanesulfonic acid (PFBS)  | 135.093 ng/mL |
|                       |          |                                         |                      |                      |                  |              | Perfluoroheptanoic acid (PFHpA)      | 14.58 ng/mL   |
|                       |          |                                         |                      |                      |                  |              | Perfluorohexanesulfonic acid (PFHxS) | 45.3726 ng/mL |
|                       |          |                                         |                      |                      |                  |              | Perfluorononanoic acid (PFNA)        | 29.7 ng/mL    |

# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

| Reagent ID            | Exp Date | Prep Date                                 | Dilutant Used        | Reagent Final Volume | Parent Reagent      |              | Analyte                              | Concentration |
|-----------------------|----------|-------------------------------------------|----------------------|----------------------|---------------------|--------------|--------------------------------------|---------------|
|                       |          |                                           |                      |                      | Reagent ID          | Volume Added |                                      |               |
|                       |          |                                           |                      |                      |                     |              | Perfluorooctanoic acid (PFOA)        | 29.7 ng/mL    |
|                       |          |                                           |                      |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)  | 59.2992 ng/mL |
|                       |          |                                           |                      |                      | LC537-IS_00065      | 2 mL         | 13C2-PFOA                            | 10 ng/mL      |
|                       |          |                                           |                      |                      |                     |              | 13C4 PFOS                            | 28.68 ng/mL   |
|                       |          |                                           |                      |                      | LC537-SU_00064      | 2 mL         | 13C2 PFDA                            | 10 ng/mL      |
|                       |          |                                           |                      |                      |                     |              | 13C2 PFHxA                           | 10 ng/mL      |
| .LC537-HSP_00028      | 09/30/18 | 03/30/18                                  | Methanol, Lot 104453 | 30 mL                | LCPFBSA_00002       | 849 uL       | Perfluorobutanesulfonic acid (PFBS)  | 1250.86 ng/mL |
|                       |          |                                           |                      |                      | LCPFHpA_00009       | 81 uL        | Perfluoroheptanoic acid (PFHpA)      | 135 ng/mL     |
|                       |          |                                           |                      |                      | LCPFHxS-br_00005    | 277 uL       | Perfluorohexanesulfonic acid (PFHxS) | 420.117 ng/mL |
|                       |          |                                           |                      |                      | LCPFNA_00009        | 165 uL       | Perfluorononanoic acid (PFNA)        | 275 ng/mL     |
|                       |          |                                           |                      |                      | LCPFOA_00010        | 165 uL       | Perfluorooctanoic acid (PFOA)        | 275 ng/mL     |
|                       |          |                                           |                      |                      | LCPFOS-br_00005     | 355 uL       | Perfluorooctanesulfonic acid (PFOS)  | 549.067 ng/mL |
| ..LCPFBSA_00002       | 12/02/21 | Wellington Laboratories, Lot LPPBS1116    |                      |                      | (Purchased Reagent) |              | Perfluorobutanesulfonic acid (PFBS)  | 44.2 ug/mL    |
| ..LCPFHpA_00009       | 12/02/21 | Wellington Laboratories, Lot PFHpA1216    |                      |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid (PFHpA)      | 50 ug/mL      |
| ..LCPFHxS-br_00005    | 01/04/22 | Wellington Laboratories, Lot brPFHxSK0117 |                      |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid (PFHxS) | 45.5 ug/mL    |
| ..LCPFNA_00009        | 07/20/22 | Wellington Laboratories, Lot PFNA0717     |                      |                      | (Purchased Reagent) |              | Perfluorononanoic acid (PFNA)        | 50 ug/mL      |
| ..LCPFOA_00010        | 09/27/22 | Wellington Laboratories, Lot PFOA0917     |                      |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)        | 50 ug/mL      |
| ..LCPFOS-br_00005     | 01/12/22 | Wellington Laboratories, Lot brPFOSK0117  |                      |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS)  | 46.4 ug/mL    |
| .LC537-IS_00065       | 10/02/18 | 04/02/18                                  | Methanol, Lot 090285 | 30000 uL             | LCM2PFOA_00010      | 60 uL        | 13C2-PFOA                            | 0.1 ug/mL     |
|                       |          |                                           |                      |                      | LCMPFOS_00024       | 180 uL       | 13C4 PFOS                            | 0.2868 ug/mL  |
| ..LCM2PFOA_00010      | 02/12/21 | Wellington Laboratories, Lot M2PFOA0216   |                      |                      | (Purchased Reagent) |              | 13C2-PFOA                            | 50 ug/mL      |
| ..LCMPFOS_00024       | 05/19/22 | Wellington Laboratories, Lot MPFOS517     |                      |                      | (Purchased Reagent) |              | 13C4 PFOS                            | 47.8 ug/mL    |
| .LC537-SU_00064       | 10/02/18 | 04/02/18                                  | Methanol, Lot 104453 | 30000 uL             | LCMPFDA_00012       | 60 uL        | 13C2 PFDA                            | 0.1 ug/mL     |
|                       |          |                                           |                      |                      | LCMPFHxA_00015      | 60 uL        | 13C2 PFHxA                           | 0.1 ug/mL     |
| ..LCMPFDA_00012       | 09/30/21 | Wellington Laboratories, Lot MPFDA0916    |                      |                      | (Purchased Reagent) |              | 13C2 PFDA                            | 50 ug/mL      |
| ..LCMPFHxA_00015      | 11/22/21 | Wellington Laboratories, Lot MPFHxA1116   |                      |                      | (Purchased Reagent) |              | 13C2 PFHxA                           | 50 ug/mL      |
| <b>LC537-L6_00022</b> | 09/30/18 | 04/02/18                                  | MeOH/H2O, Lot 090285 | 5 mL                 | LC537-HSP_00028     | 720 uL       | Perfluorobutanesulfonic acid (PFBS)  | 180.124 ng/mL |
|                       |          |                                           |                      |                      |                     |              | Perfluoroheptanoic acid (PFHpA)      | 19.44 ng/mL   |
|                       |          |                                           |                      |                      |                     |              | Perfluorohexanesulfonic acid (PFHxS) | 60.4968 ng/mL |
|                       |          |                                           |                      |                      |                     |              | Perfluorononanoic acid (PFNA)        | 39.6 ng/mL    |
|                       |          |                                           |                      |                      |                     |              | Perfluorooctanoic acid (PFOA)        | 39.6 ng/mL    |
|                       |          |                                           |                      |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)  | 79.0656 ng/mL |
|                       |          |                                           |                      |                      | LC537-IS_00065      | 500 uL       | 13C2-PFOA                            | 10 ng/mL      |
|                       |          |                                           |                      |                      |                     |              | 13C4 PFOS                            | 28.68 ng/mL   |
|                       |          |                                           |                      |                      | LC537-SU_00064      | 500 uL       | 13C2 PFDA                            | 10 ng/mL      |
|                       |          |                                           |                      |                      |                     |              | 13C2 PFHxA                           | 10 ng/mL      |

# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

| Reagent ID         | Exp Date | Prep Date                                 | Dilutant Used        | Reagent Final Volume | Parent Reagent                       |              | Analyte                              | Concentration |
|--------------------|----------|-------------------------------------------|----------------------|----------------------|--------------------------------------|--------------|--------------------------------------|---------------|
|                    |          |                                           |                      |                      | Reagent ID                           | Volume Added |                                      |               |
| .LC537-HSP_00028   | 09/30/18 | 03/30/18                                  | Methanol, Lot 104453 | 30 mL                | LCPFBSA_00002                        | 849 uL       | Perfluorobutanesulfonic acid (PFBS)  | 1250.86 ng/mL |
|                    |          |                                           |                      |                      | LCPFHpA_00009                        | 81 uL        | Perfluoroheptanoic acid (PFHpA)      | 135 ng/mL     |
|                    |          |                                           |                      |                      | LCPFHxS-br_00005                     | 277 uL       | Perfluorohexanesulfonic acid (PFHxS) | 420.117 ng/mL |
|                    |          |                                           |                      |                      | LCPFNA_00009                         | 165 uL       | Perfluorononanoic acid (PFNA)        | 275 ng/mL     |
|                    |          |                                           |                      |                      | LCPFOA_00010                         | 165 uL       | Perfluorooctanoic acid (PFOA)        | 275 ng/mL     |
|                    |          |                                           |                      |                      | LCPFOS-br_00005                      | 355 uL       | Perfluorooctanesulfonic acid (PFOS)  | 549.067 ng/mL |
| ..LCPFBSA_00002    | 12/02/21 | Wellington Laboratories, Lot LPFBS1116    |                      |                      | (Purchased Reagent)                  |              | Perfluorobutanesulfonic acid (PFBS)  | 44.2 ug/mL    |
| ..LCPFHpA_00009    | 12/02/21 | Wellington Laboratories, Lot PFHpA1216    |                      |                      | (Purchased Reagent)                  |              | Perfluoroheptanoic acid (PFHpA)      | 50 ug/mL      |
| ..LCPFHxS-br_00005 | 01/04/22 | Wellington Laboratories, Lot brPFHxSK0117 |                      |                      | (Purchased Reagent)                  |              | Perfluorohexanesulfonic acid (PFHxS) | 45.5 ug/mL    |
| ..LCPFNA_00009     | 07/20/22 | Wellington Laboratories, Lot PFNA0717     |                      |                      | (Purchased Reagent)                  |              | Perfluorononanoic acid (PFNA)        | 50 ug/mL      |
| ..LCPFOA_00010     | 09/27/22 | Wellington Laboratories, Lot PFOA0917     |                      |                      | (Purchased Reagent)                  |              | Perfluorooctanoic acid (PFOA)        | 50 ug/mL      |
| ..LCPFOS-br_00005  | 01/12/22 | Wellington Laboratories, Lot brPFOSK0117  |                      |                      | (Purchased Reagent)                  |              | Perfluorooctanesulfonic acid (PFOS)  | 46.4 ug/mL    |
| .LC537-IS_00065    | 10/02/18 | 04/02/18                                  | Methanol, Lot 090285 | 30000 uL             | LCM2PFOA_00010                       | 60 uL        | 13C2-PFOA                            | 0.1 ug/mL     |
|                    |          |                                           |                      |                      | LCMPFOS_00024                        | 180 uL       | 13C4 PFOS                            | 0.2868 ug/mL  |
| ..LCM2PFOA_00010   | 02/12/21 | Wellington Laboratories, Lot M2PFOA0216   |                      |                      | (Purchased Reagent)                  |              | 13C2-PFOA                            | 50 ug/mL      |
| ..LCMPFOS_00024    | 05/19/22 | Wellington Laboratories, Lot MPFOS517     |                      |                      | (Purchased Reagent)                  |              | 13C4 PFOS                            | 47.8 ug/mL    |
| .LC537-SU_00064    | 10/02/18 | 04/02/18                                  | Methanol, Lot 104453 | 30000 uL             | LCMPFDA_00012                        | 60 uL        | 13C2 PFDA                            | 0.1 ug/mL     |
|                    |          |                                           |                      |                      | LCMPFHxA_00015                       | 60 uL        | 13C2 PFHxA                           | 0.1 ug/mL     |
| ..LCMPFDA_00012    | 09/30/21 | Wellington Laboratories, Lot MPFDA0916    |                      |                      | (Purchased Reagent)                  |              | 13C2 PFDA                            | 50 ug/mL      |
| ..LCMPFHxA_00015   | 11/22/21 | Wellington Laboratories, Lot MPFHxA1116   |                      |                      | (Purchased Reagent)                  |              | 13C2 PFHxA                           | 50 ug/mL      |
| LC537-MSP_00033    | 09/30/18 | 03/30/18                                  | Methanol, Lot 104453 | 30 mL                | LCPFBSA_00002                        | 509 uL       | Perfluorobutanesulfonic acid (PFBS)  | 749.927 ng/mL |
|                    |          |                                           |                      |                      | LCPFHpA_00009                        | 48 uL        | Perfluoroheptanoic acid (PFHpA)      | 80 ng/mL      |
|                    |          |                                           |                      |                      | LCPFHxS-br_00005                     | 165 uL       | Perfluorohexane Sulfonate            | 250.25 ng/mL  |
|                    |          |                                           |                      |                      |                                      |              | Perfluorohexanesulfonic acid (PFHxS) | 250.25 ng/mL  |
|                    |          |                                           |                      |                      | LCPFNA_00009                         | 99 uL        | Perfluorononanoic acid (PFNA)        | 165 ng/mL     |
|                    |          |                                           |                      |                      | LCPFOA_00010                         | 99 uL        | Perfluorooctanoic acid (PFOA)        | 165 ng/mL     |
| LCPFOS-br_00005    | 213 uL   | Perfluorooctanesulfonic acid (PFOS)       | 329.44 ng/mL         |                      |                                      |              |                                      |               |
| .LCPFBSA_00002     | 12/02/21 | Wellington Laboratories, Lot LPFBS1116    |                      |                      | (Purchased Reagent)                  |              | Perfluorobutanesulfonic acid (PFBS)  | 44.2 ug/mL    |
| .LCPFHpA_00009     | 12/02/21 | Wellington Laboratories, Lot PFHpA1216    |                      |                      | (Purchased Reagent)                  |              | Perfluoroheptanoic acid (PFHpA)      | 50 ug/mL      |
| .LCPFHxS-br_00005  | 01/04/22 | Wellington Laboratories, Lot brPFHxSK0117 | (Purchased Reagent)  |                      | Perfluorohexane Sulfonate            | 45.5 ug/mL   |                                      |               |
|                    |          |                                           |                      |                      | Perfluorohexanesulfonic acid (PFHxS) | 45.5 ug/mL   |                                      |               |
| .LCPFNA_00009      | 07/20/22 | Wellington Laboratories, Lot PFNA0717     |                      |                      | (Purchased Reagent)                  |              | Perfluorononanoic acid (PFNA)        | 50 ug/mL      |
| .LCPFOA_00010      | 09/27/22 | Wellington Laboratories, Lot PFOA0917     |                      |                      | (Purchased Reagent)                  |              | Perfluorooctanoic acid (PFOA)        | 50 ug/mL      |



# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

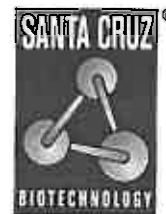
| Reagent ID       | Exp Date | Prep Date                                | Dilutant Used        | Reagent Final Volume | Parent Reagent      |              | Analyte                             | Concentration |  |  |
|------------------|----------|------------------------------------------|----------------------|----------------------|---------------------|--------------|-------------------------------------|---------------|--|--|
|                  |          |                                          |                      |                      | Reagent ID          | Volume Added |                                     |               |  |  |
| .LCPFOS-br_00005 | 01/12/22 | Wellington Laboratories, Lot brPFOSK0117 |                      |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS) | 46.4 ug/mL    |  |  |
| LC537-SU_00074   | 01/05/19 | 07/16/18                                 | Methanol, Lot 104453 | 30000 uL             | LCMPFDA_00012       | 60 uL        | 13C2 PFDA                           | 0.1 ug/mL     |  |  |
|                  |          |                                          |                      |                      | LCMPFHxA_00015      | 60 uL        | 13C2 PFHxA                          | 0.1 ug/mL     |  |  |
| .LCMPFDA_00012   | 09/30/21 | Wellington Laboratories, Lot MPFDA0916   |                      |                      | (Purchased Reagent) |              | 13C2 PFDA                           | 50 ug/mL      |  |  |
| .LCMPFHxA_00015  | 11/22/21 | Wellington Laboratories, Lot MPFHxA1116  |                      |                      | (Purchased Reagent) |              | 13C2 PFHxA                          | 50 ug/mL      |  |  |

Reagent

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**LC537\_PFB2\_00002**

7:6&17 SW



# CERTIFICATE OF ANALYSIS

*The Power to Question*

Catalog Number: sc-236187  
 Lot Number: F0917  
 Product Name: Nonafluorobutane-1-sulfonic acid  
 CAS Number: 375-73-5  
 Molecular Formula:  $C_4HF_9O_3S$   
 Molecular Weight: 300.10

| Test                                | Specification         | Result   |
|-------------------------------------|-----------------------|----------|
| Appearance                          | Colorless liquid      | Complies |
| Identification ( $^{19}F$ -NMR)     | Conforms to structure | Complies |
| Purity (Sodium Hydroxide Titration) | $\geq 97\%$           | 101.3%   |
| Infrared Spectrum                   | Conforms to structure | Complies |

Reagent

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**LC537\_PFHpA2\_00002**

# Certificate of analysis

R: 6.13.17 SW

PFHe A

Product No.: A12092  
Product: Perfluoroheptanoic acid, 98+%  
Lot No.: 10200390

Appearance: White fused solid  
Water Content (Karl-Fischer): 0.30%  
Melting Point: 32.0-34.3°C  
Assay (Aqueous acid-base titration): 99.7%  
Identification (FTIR): Conforms

This document has been electronically generated and does not require a signature.

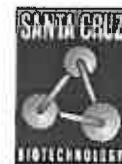
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SCIENTIFIC

Reagent

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**LC537\_PFHxS2\_00002**



The Future is Now

# CERTIFICATE OF ANALYSIS

Catalog Number: sc-237289  
 Lot Number: G2516  
 Product Name: Tridecafluorohexane-1-sulfonic acid potassium salt  
 CAS Number: 3871-99-6  
 Molecular Formula:  $C_6F_{13}KO_3S$   
 Molecular Weight: 438.20

| Test                               | Specification                           | Result       |
|------------------------------------|-----------------------------------------|--------------|
| Appearance                         | White to faint beige powder or crystals | White powder |
| Identification (Infrared Spectrum) | Consistent with structure               | Complies     |
| Purity (Titration, Ion Exchange)   | $\geq 98.0\%$                           | 100.4%       |

$PFH_x S-K$

$C_6F_{13}SO_3K$  438.201

$C_6F_{13}SO_3H$  400.111

$$MW \text{ correction} = \frac{400.11}{438.201} = 0.91307 \quad \frac{PFH_x S}{\text{cas\# 355-46-4}}$$

$$\text{Purity} \div MW \text{ correction} = 90.9\%$$

*This document was produced electronically and is valid without a signature.*

Reagent

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**LC537\_PFNA2\_00002**



17.6.14.17 SW

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: [www.sigmaaldrich.com](http://www.sigmaaldrich.com)

Email USA: [techserv@sial.com](mailto:techserv@sial.com)

Outside USA: [eurtechserv@sial.com](mailto:eurtechserv@sial.com)

## Certificate of Analysis

Product Name:

Perfluorononanoic acid - 97%

Product Number:

394459

Batch Number:

MKCC0699

Brand:

ALDRICH

CAS Number:

375-95-1

MDL Number:

MFCD00039605

Formula:

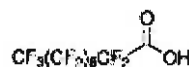
C<sub>9</sub>H<sub>17</sub>O<sub>2</sub>

Formula Weight:

464.08 g/mol

Quality Release Date:

07 DEC 2016



| Test               | Specification                                                                  | Result   |
|--------------------|--------------------------------------------------------------------------------|----------|
| Appearance (Color) | White to Off-White                                                             | White    |
| Appearance (Form)  | Powder or Crystals or Crystalline<br>Chunk(s) or Granule or Flakes<br>or Solid | Powder   |
| Infrared Spectrum  | Conforms to Structure                                                          | Conforms |
| GC (area %)        | > 96.5 %                                                                       | 98.2 %   |

Michael Grady, Manager  
Quality Control  
Milwaukee, WI US

PFNA

Sigma-Aldrich warrants, that at the time of the quality release or subsequent retest date this product conformed to the information contained in this publication. The current Specification sheet may be available at [Sigma-Aldrich.com](http://Sigma-Aldrich.com). For further inquiries, please contact Technical Service. Purchaser must determine the suitability of the product for its particular use. See reverse side of invoice or packing slip for additional terms and conditions of sale.

Reagent

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**LC537\_PFOA2\_00002**

# Certificate of analysis

P: 6/9/17 SW

Product No.: L08862  
Product: Perfluorooctanoic acid, 95%  
Lot No.: 10199078

PFOA

Appearance: White powder  
Water Content (Karl-Fischer): 1.30%  
Melting Point: 47.6-54.0°C  
Assay (Aqueous acid-base titration): 98.4%  
Assay (GC Silyl Deriv): 97.2%

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**LC537\_PFOS2\_00002**

V: 6.14.17 SKV

**SIGMA-ALDRICH**

3050 Spruce Street, Saint Louis, MO 63103 USA  
Email USA: techserv@sial.com Outside USA: eurtechserv@sial.com

## Certificate of Analysis

**Product Name:** HEPTADEC AFLUORO OCTANESULFONIC ACID TETRAETHYLAMMONIUM SALT  
98 %  
**Product Number:** 365289  
**Batch Number:** BCBQ0108V  
**Brand:** Aldrich  
**CAS Number:** 56773-42-3  
**Formula:**  $\text{CF}_3(\text{CF}_2)_6\text{CF}_2\text{SO}_3\text{N}(\text{C}_2\text{H}_5)_4$   
**Formula Weight:** 629.37  
**Quality Release Date:** 11 JUN 2015

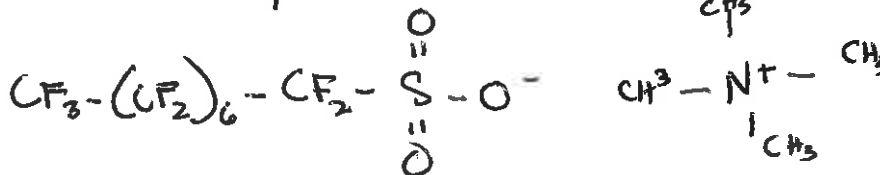
| TEST               | SPECIFICATION                  | RESULT    |
|--------------------|--------------------------------|-----------|
| APPEARANCE (COLOR) | WHITE TO OFF WHITE             | OFF-WHITE |
| APPEARANCE (FORM)  | POWDER OR POWDER WITH CHUNK(S) | POWDER    |
| CARBON CONTENT     | 29.77 % - 31.29 %              | 29.97 %   |
| INFRARED SPECTRUM  | CONFORMS TO STRUCTURE          | CONFORMS  |

*Claudia Geitner*

Dr. Claudia Geitner  
Manager Quality Control  
Buchs, Switzerland

$$\text{MW correction: } \frac{500.125}{629.37} = 0.7946$$

$$\text{Purity \& mw correction} = 77.87\%$$



|            |         |
|------------|---------|
| C = 12.011 | 96.088  |
| F = 18.998 | 322.966 |
| S = 32.066 | 32.066  |
| O = 15.999 | 47.997  |
| H = 1.008  | 1.008   |
| N = 14.007 | —       |
|            | <hr/>   |
|            | 500.125 |



96.088

20.460

14.007

---

130.255

Reagent

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**LCM2PFOA\_00010**



# WELLINGTON LABORATORIES

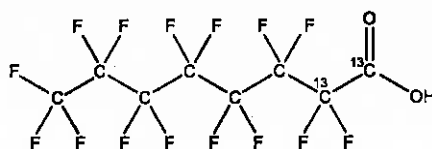
## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** M2PFOA  
**COMPOUND:** Perfluoro-n-[1,2-<sup>13</sup>C<sub>2</sub>]octanoic acid

**LOT NUMBER:** M2PFOA0216

**STRUCTURE:**

**CAS #:** Not available



**MOLECULAR FORMULA:** <sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>6</sub>HF<sub>16</sub>O<sub>2</sub>  
**CONCENTRATION:** 50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:** 416.05  
**SOLVENT(S):** Methanol  
Water (<1%)

**CHEMICAL PURITY:** >98%  
**LAST TESTED:** (mm/dd/yyyy) 02/12/2016  
**EXPIRY DATE:** (mm/dd/yyyy) 02/12/2021

**ISOTOPIC PURITY:** ≥99% <sup>13</sup>C  
(1,2-<sup>13</sup>C<sub>2</sub>)

**RECOMMENDED STORAGE:** Store ampoule in a cool, dark place

**DOCUMENTATION/ DATA ATTACHED:**

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

**ADDITIONAL INFORMATION:**

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

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

**Certified By:**

B.G. Chittim

**Date:** 02/24/2016  
(mm/dd/yyyy)

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

**INTENDED USE:**

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

**HAZARDS:**

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

**SYNTHESIS / CHARACTERIZATION:**

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

**HOMOGENEITY:**

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

**UNCERTAINTY:**

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty,  $u_c(y)$ , of a value  $y$  and the uncertainty of the independent parameters

$x_1, x_2, \dots, x_n$  on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where  $x$  is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

**TRACEABILITY:**

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

**EXPIRY DATE / PERIOD OF VALIDITY:**

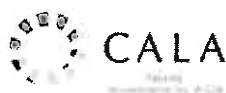
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**LIMITED WARRANTY:**

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

**QUALITY MANAGEMENT:**

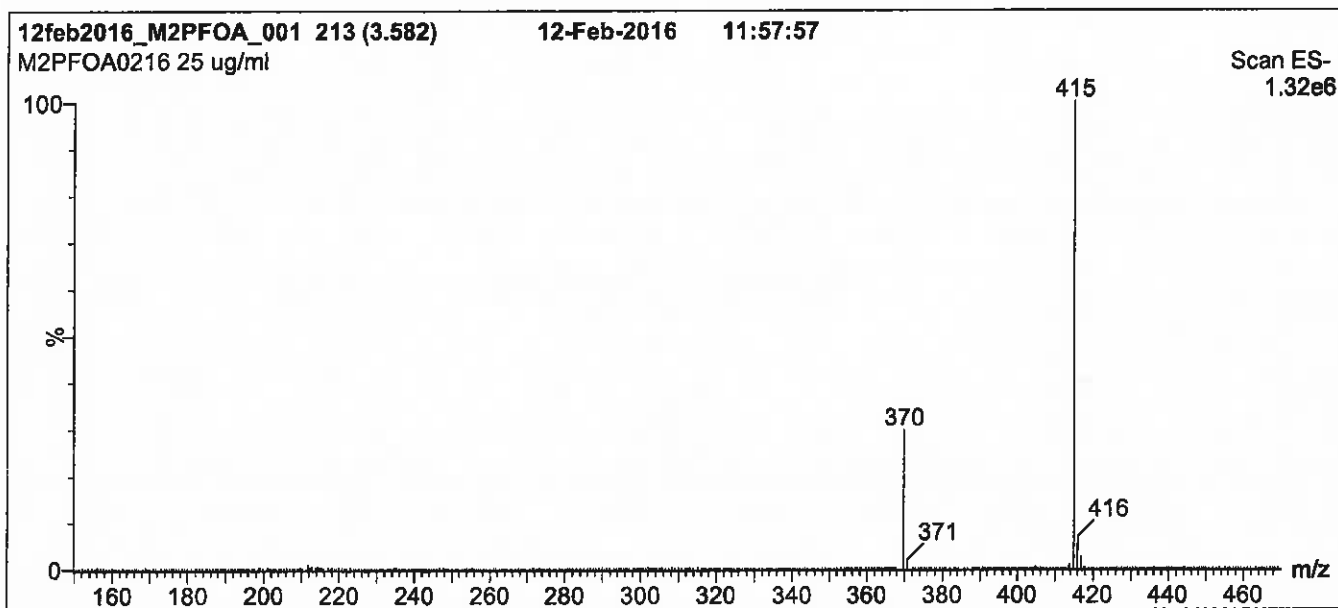
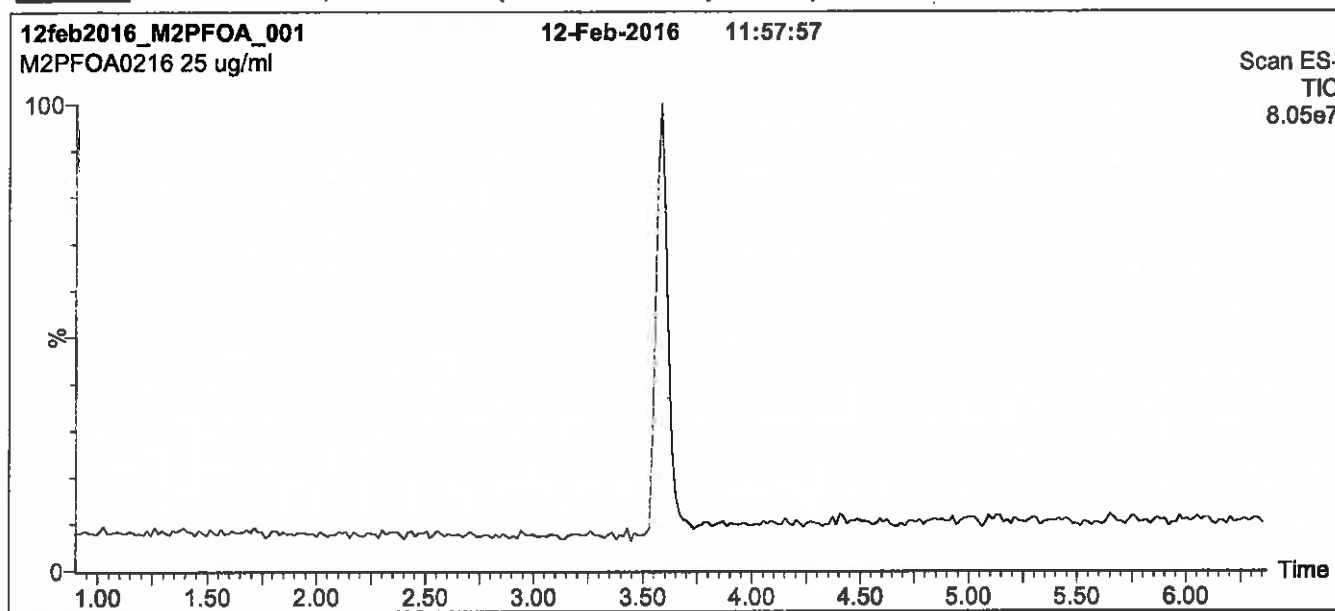
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at [www.well-labs.com](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\*



**Figure 1:** M2PFOA; LC/MS Data (TIC and Mass Spectrum)



**Conditions for Figure 1:**

**LC:** Waters Acquity Ultra Performance LC  
**MS:** Micromass Quattro micro API MS

**Chromatographic Conditions**

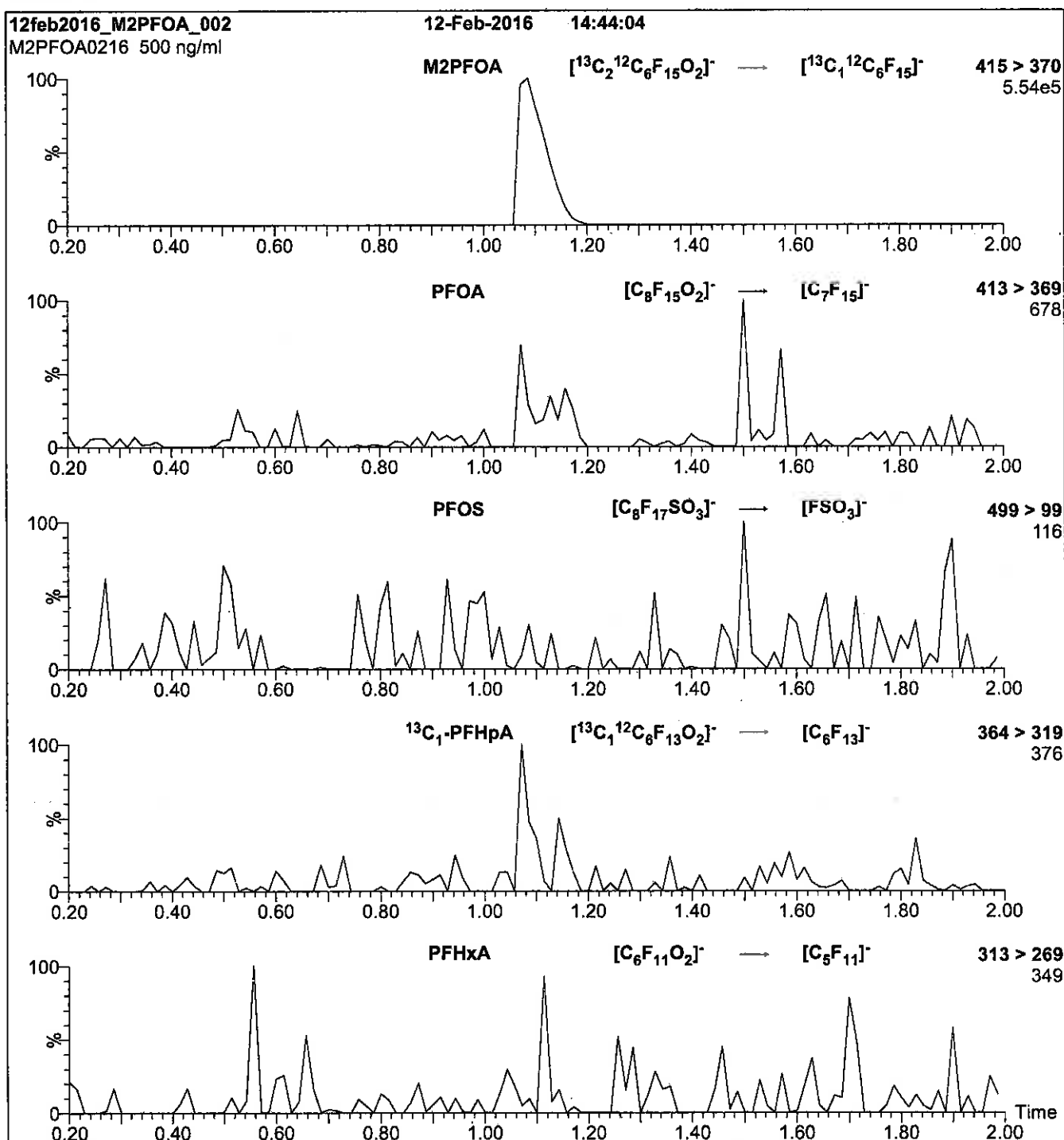
Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm  
Mobile phase: Gradient  
Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 7.5 min and hold for 1.5 min  
before returning to initial conditions in 0.5 min.  
Time: 10 min

Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)  
Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 15.00  
Cone Gas Flow (l/hr) = 100  
Desolvation Gas Flow (l/hr) = 750

**Figure 2: M2PFOA; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu\text{l}$  (500 ng/ml M2PFOA)

Mobile phase: Isocratic 80% MeOH / 20%  $\text{H}_2\text{O}$

Flow: 300  $\mu\text{l}/\text{min}$

**MS Parameters**

Collision Gas (mbar) =  $3.39\text{e-}3$   
Collision Energy (eV) = 10

Reagent

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**LCMPFDA\_00012**

R: SBC 12/21/16



814255

ID: LCMFDA\_00012

Exp: 09/30/21 Prod: SBC

13C2-Perfluorodecanoic a



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

MPFDA

**COMPOUND:**

Perfluoro-n-[1,2-<sup>13</sup>C<sub>2</sub>]decanoic acid

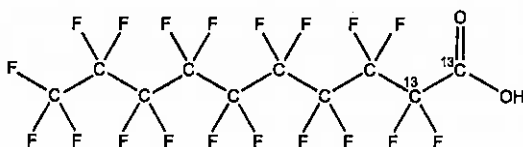
**LOT NUMBER:**

MPFDA0916

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>8</sub>H<sub>18</sub>O<sub>2</sub>

**CONCENTRATION:**

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:**

516.07

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

**ISOTOPIC PURITY:**

≥99% <sup>13</sup>C

(1,2-<sup>13</sup>C<sub>2</sub>)

**LAST TESTED:** (mm/dd/yyyy)

09/30/2016

**EXPIRY DATE:** (mm/dd/yyyy)

09/30/2021

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

**DOCUMENTATION/ DATA ATTACHED:**

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

**ADDITIONAL INFORMATION:**

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of <sup>13</sup>C<sub>1</sub>-PFNA.

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

Certified By:

B.G. Chittim

Date: 10/07/2016

(mm/dd/yyyy)

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

**INTENDED USE:**

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

**HAZARDS:**

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

**SYNTHESIS / CHARACTERIZATION:**

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

**HOMOGENEITY:**

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

**UNCERTAINTY:**

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty,  $u_c(y)$ , of a value  $y$  and the uncertainty of the independent parameters  $x_1, x_2, \dots, x_n$  on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where  $x$  is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

**TRACEABILITY:**

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

**EXPIRY DATE / PERIOD OF VALIDITY:**

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**LIMITED WARRANTY:**

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

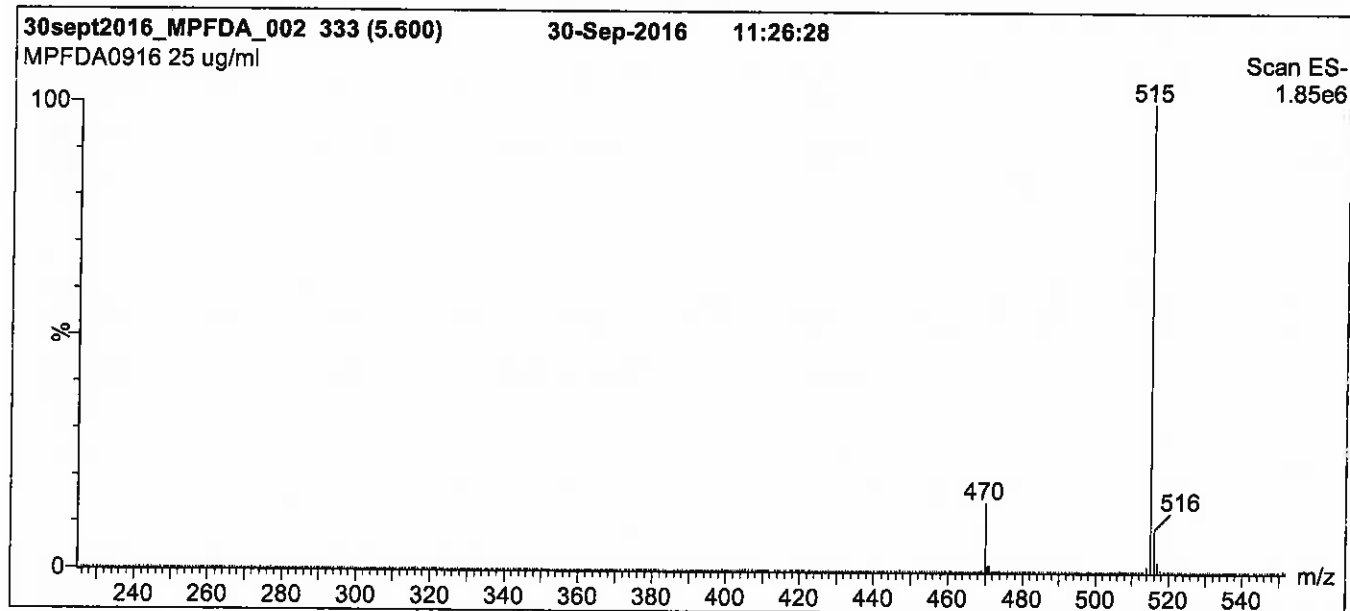
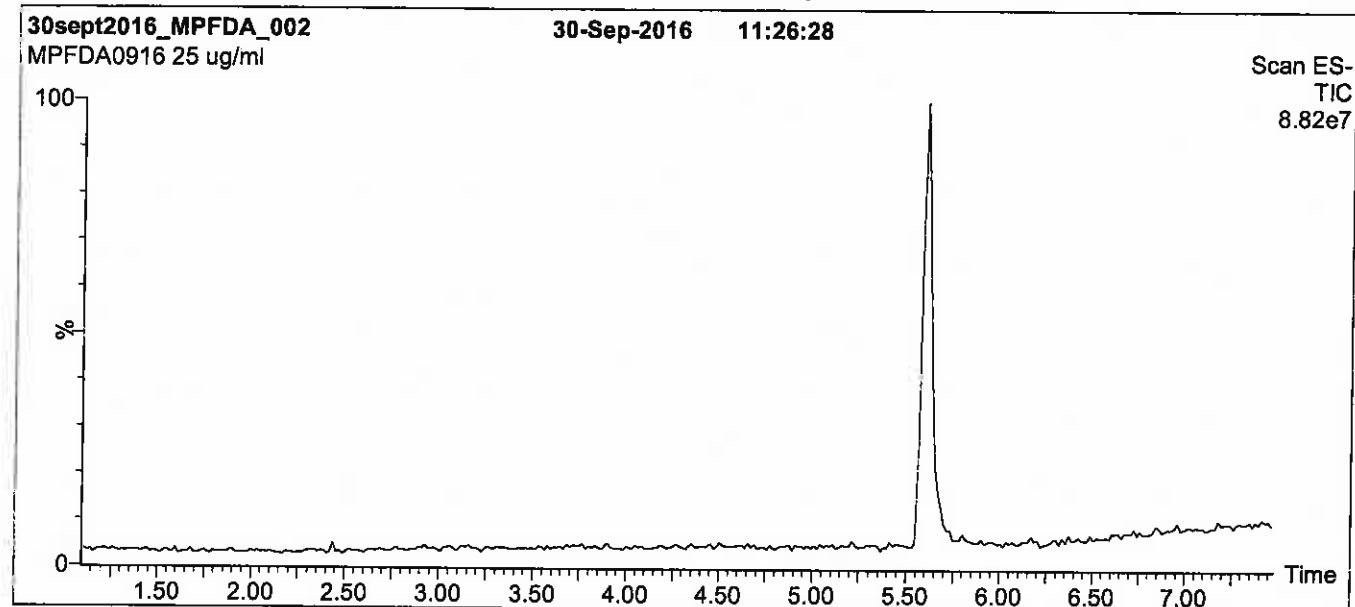
**QUALITY MANAGEMENT:**

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at [www.well-labs.com](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\*

**Figure 1: MPFDA; LC/MS Data (TIC and Mass Spectrum)**



**Conditions for Figure 1:**

**LC:** Waters Acquity Ultra Performance LC  
**MS:** Micromass Quattro micro API MS

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient  
Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 7 min and hold for 1.5 min  
before returning to initial conditions in 0.5 min.  
Time: 10 min

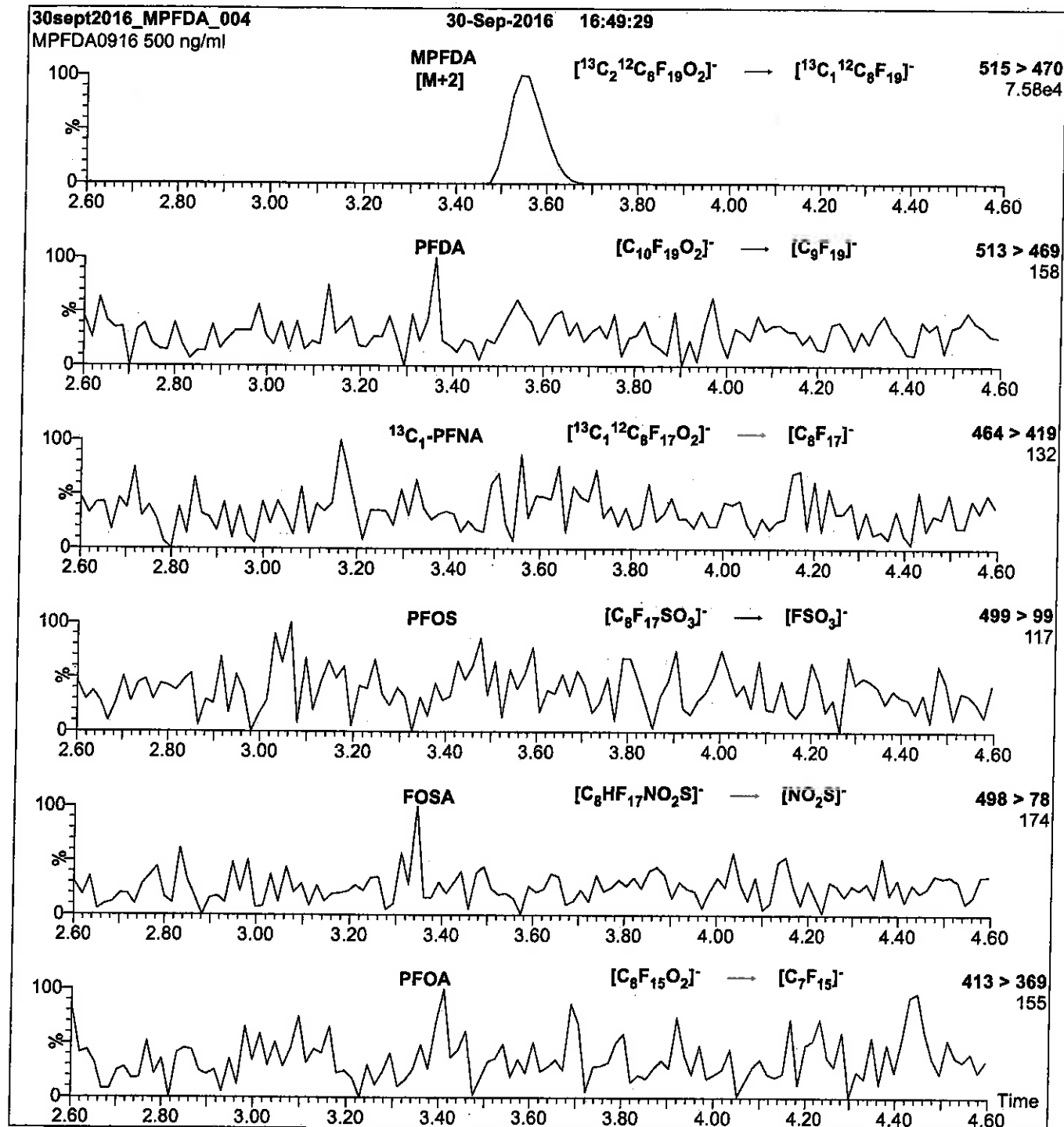
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 2.00  
Cone Voltage (V) = 15.00  
Cone Gas Flow (l/hr) = 50  
Desolvation Gas Flow (l/hr) = 750

**Figure 2: MPFDA; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop Injection  
10  $\mu$ l (500 ng/ml MPFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

Collision Gas (mbar) = 3.31e-3  
Collision Energy (eV) = 13

Reagent

---

**LCMPFHxA\_00015**



r: 5/10/17 SKJ



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

MPFHxA

**LOT NUMBER:**

MPFHxA1116

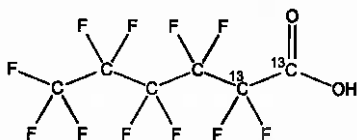
**COMPOUND:**

Perfluoro-n-[1,2-<sup>13</sup>C<sub>2</sub>]hexanoic acid

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>4</sub>HF<sub>11</sub>O<sub>2</sub>

**CONCENTRATION:**

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:**

316.04

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

**ISOTOPIC PURITY:**

≥99%<sup>13</sup>C

**LAST TESTED:** (mm/dd/yyyy)

11/22/2016

**EXPIRY DATE:** (mm/dd/yyyy)

11/22/2021

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

**DOCUMENTATION/ DATA ATTACHED:**

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

**ADDITIONAL INFORMATION:**

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-hexanoic acid and ~ 0.3% of perfluoro-n-octanoic acid.

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

Certified By:

B.G. Chittim

Date: 12/13/2016

(mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA  
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**EXPIRY DATE / PERIOD OF VALIDITY:**

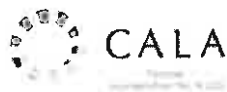
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**LIMITED WARRANTY:**

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

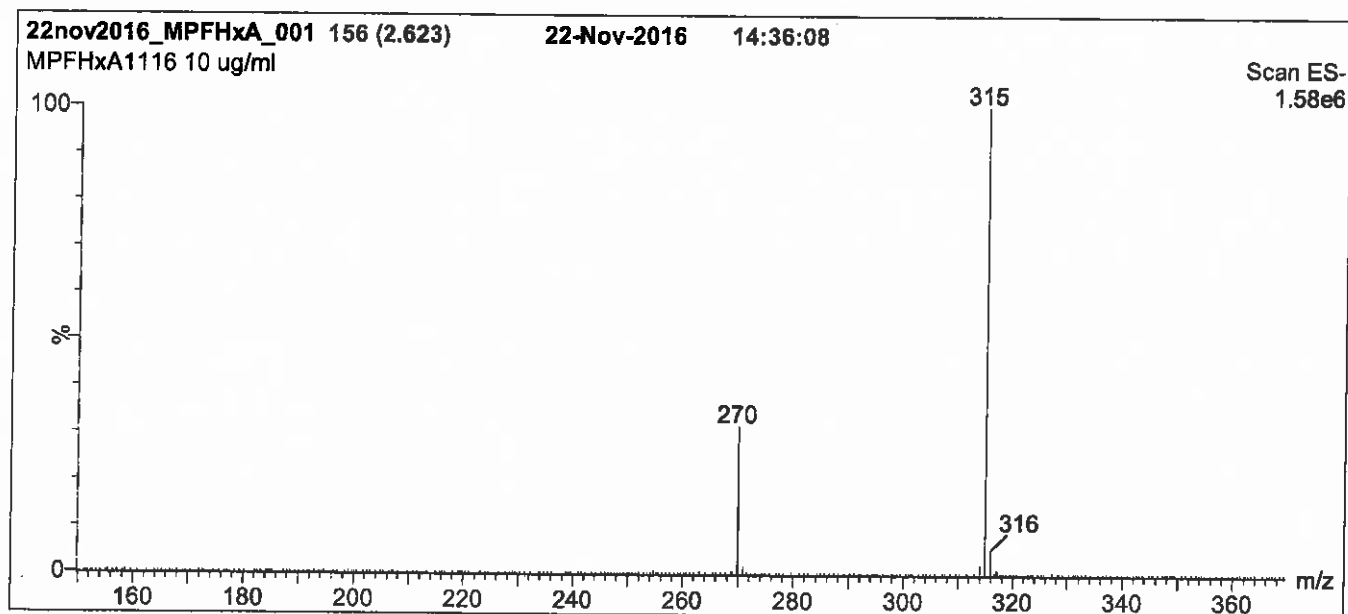
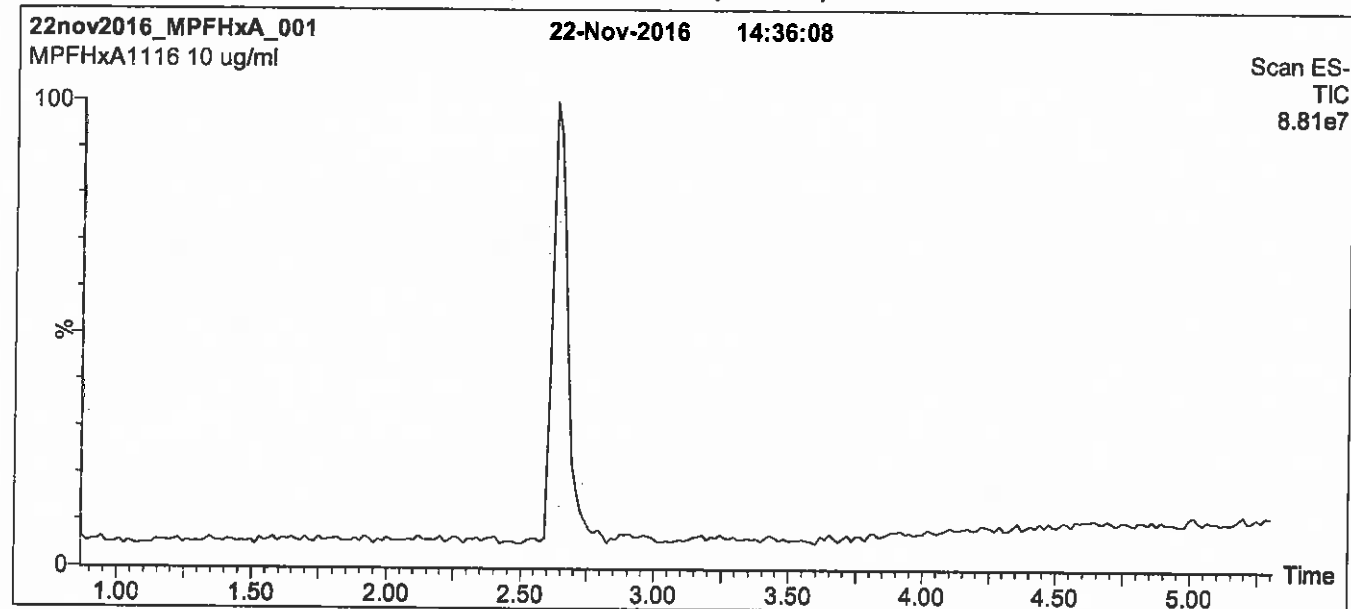
**QUALITY MANAGEMENT:**

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**Figure 1: MPFHxA; LC/MS Data (TIC and Mass Spectrum)**



**Conditions for Figure 1:**

**LC:** Waters Acquity Ultra Performance LC  
**MS:** Micromass Quattro micro API MS

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient  
Start: 40% (80:20 MeOH:ACN) / 60% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 7 min and hold for 2 min  
before returning to initial conditions over 0.5 min.  
Time: 10 min

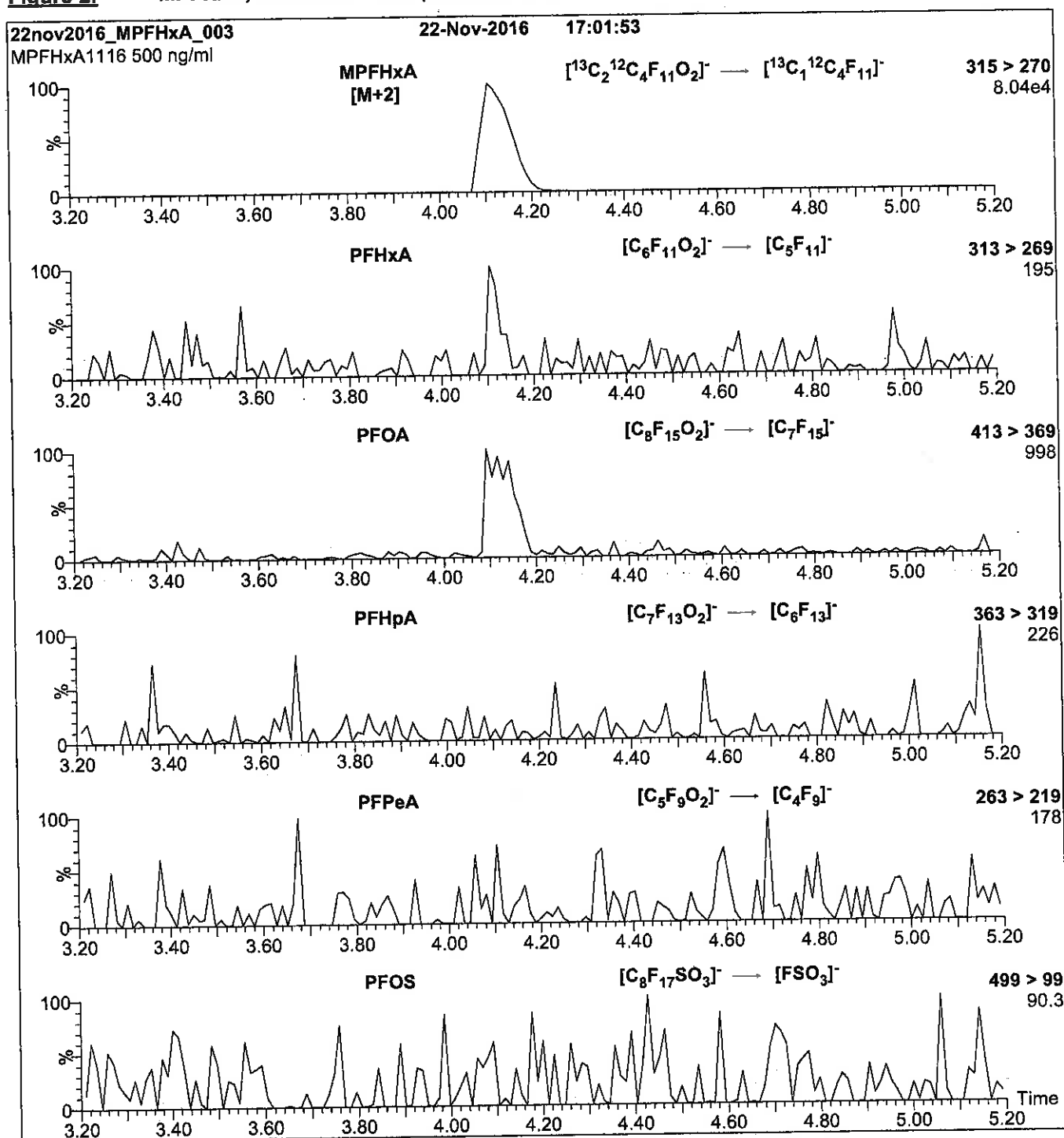
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 2.00  
Cone Voltage (V) = 15.00  
Cone Gas Flow (l/hr) = 100  
Desolvation Gas Flow (l/hr) = 750

**Figure 2: MPFHxA; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu$ l (500 ng/ml MPFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20%  $H_2O$   
(both with 10 mM  $NH_4OAc$  buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

Collision Gas (mbar) = 3.46e-3  
Collision Energy (eV) = 10

Reagent

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**LCMPFOS\_00024**

r: 8/2/17 SKJ



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

MPFOS

**LOT NUMBER:**

MPFOS0517

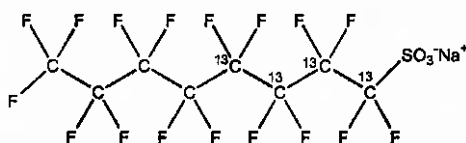
**COMPOUND:**

Sodium perfluoro-1-[1,2,3,4-<sup>13</sup>C<sub>4</sub>]octanesulfonate

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

<sup>13</sup>C<sub>4</sub><sup>12</sup>C<sub>4</sub>F<sub>17</sub>SO<sub>3</sub>Na

**MOLECULAR WEIGHT:**

526.08

**CONCENTRATION:**

50.0 ± 2.5 µg/ml (Na salt)

**SOLVENT(S):**

Methanol

47.8 ± 2.4 µg/ml (MPFOS anion)

**CHEMICAL PURITY:**

>98%

**ISOTOPIC PURITY:**

≥99% <sup>13</sup>C

**LAST TESTED:** (mm/dd/yyyy)

05/19/2017

(1,2,3,4-<sup>13</sup>C<sub>4</sub>)

**EXPIRY DATE:** (mm/dd/yyyy)

05/19/2022

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

**DOCUMENTATION/ DATA ATTACHED:**

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

**ADDITIONAL INFORMATION:**

- See page 2 for further details.
- Contains ~ 0.8% Sodium perfluoro-1-[1,2,3-<sup>13</sup>C<sub>3</sub>]heptanesulfonate.

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

Certified By:

B.G. Chittim, General Manager

Date: 05/30/2017

(mm/dd/yyyy)

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

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**UNCERTAINTY:**

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty,  $u_c(y)$ , of a value  $y$  and the uncertainty of the independent parameters

$x_1, x_2, \dots, x_n$  on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

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The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

**TRACEABILITY:**

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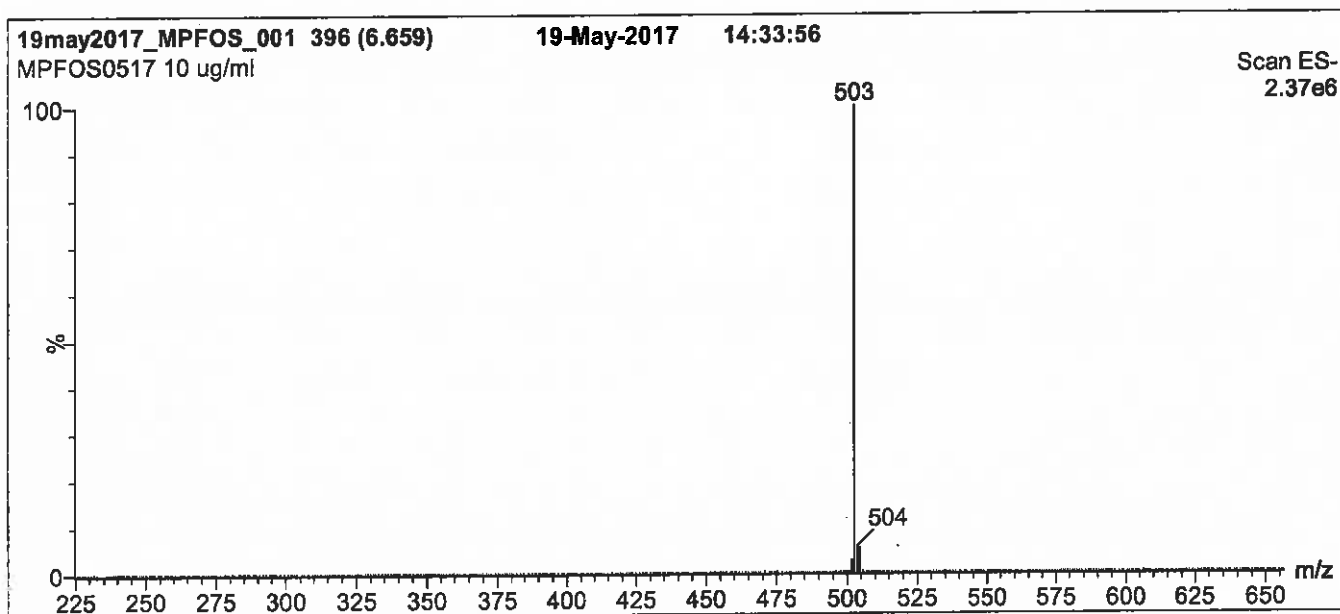
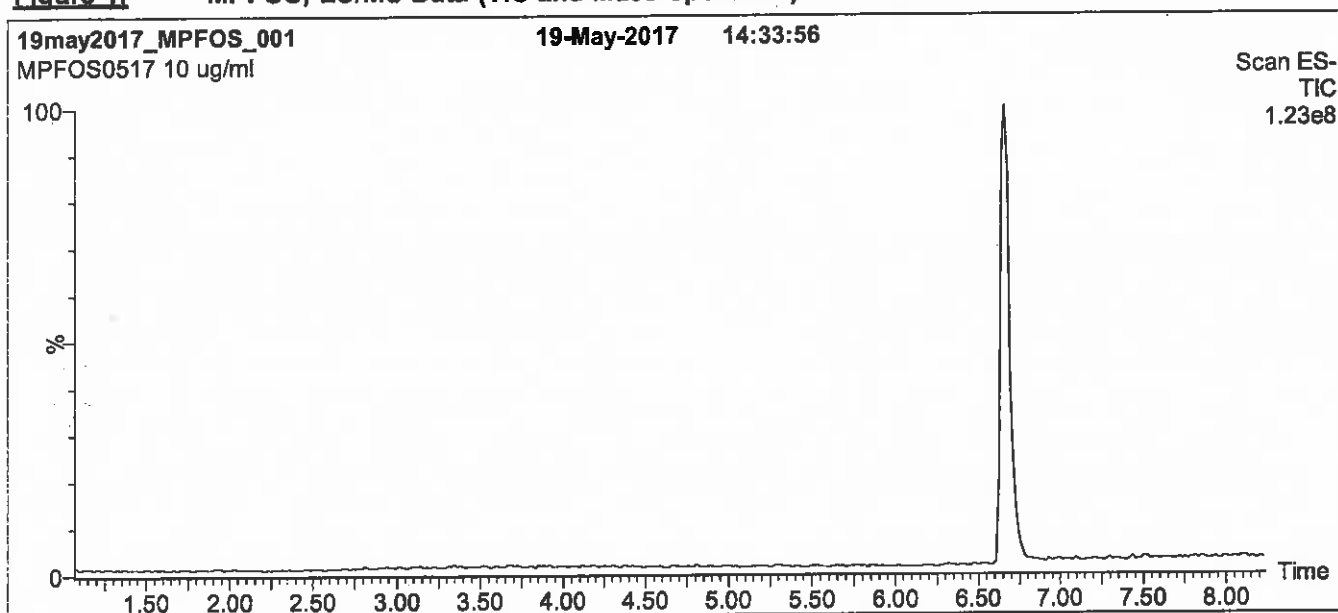
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**Figure 1: MPFOS; LC/MS Data (TIC and Mass Spectrum)**



**Conditions for Figure 1:**

**LC:** Waters Acquity Ultra Performance LC  
**MS:** Micromass Quattro micro API MS

**Chromatographic Conditions**

**Column:** Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

**Mobile phase:** Gradient  
Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 8 min and hold for 1 min  
before returning to initial conditions in 0.5 min.  
Time: 10 min

**Flow:** 300  $\mu$ l/min

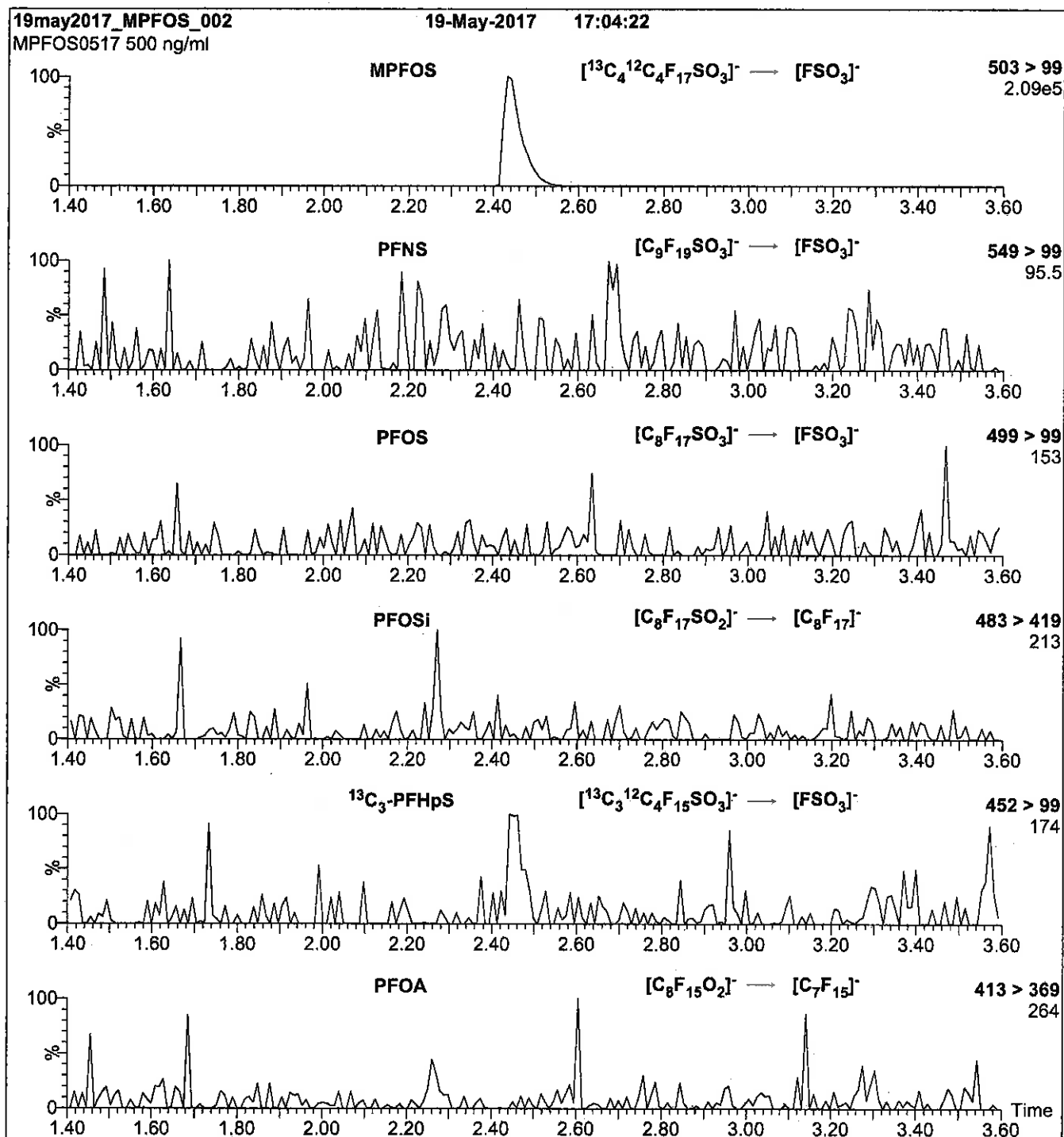
**MS Parameters**

**Experiment:** Full Scan (225 - 850 amu)

**Source:** Electrospray (negative)  
**Capillary Voltage (kV)** = 3.00  
**Cone Voltage (V)** = 60.00  
**Cone Gas Flow (l/hr)** = 60  
**Desolvation Gas Flow (l/hr)** = 750



**Figure 2: MPFOS; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu\text{l}$  (500 ng/ml MPFOS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20%  $\text{H}_2\text{O}$   
(both with 10 mM  $\text{NH}_4\text{OAc}$  buffer)

Flow: 300  $\mu\text{l}/\text{min}$

**MS Parameters**

Collision Gas (mbar) =  $3.31\text{e-}3$   
Collision Energy (eV) = 40

Reagent

---

**LCPFBSA\_00002**

n: 4/2/17 SKW



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

L-PFBS

**LOT NUMBER:**

LPFBS1116

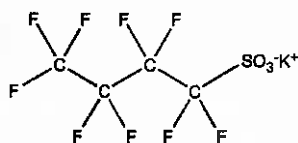
**COMPOUND:**

Potassium perfluoro-1-butanesulfonate

**STRUCTURE:**

**CAS #:**

29420-49-3



**MOLECULAR FORMULA:**

C<sub>4</sub>F<sub>9</sub>SO<sub>3</sub>K

**MOLECULAR WEIGHT:**

338.19

**CONCENTRATION:**

50.0 ± 2.5 µg/ml (K salt)

**SOLVENT(S):**

Methanol

44.2 ± 2.2 µg/ml (PFBS anion)

**CHEMICAL PURITY:**

>98%

**LAST TESTED:** (mm/dd/yyyy)

12/02/2016

**EXPIRY DATE:** (mm/dd/yyyy)

12/02/2021

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

**DOCUMENTATION/ DATA ATTACHED:**

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

**ADDITIONAL INFORMATION:**

See page 2 for further details.

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Certified By:

B.G. Chittim

Date: 12/05/2016

(mm/dd/yyyy)

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The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

**TRACEABILITY:**

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

**EXPIRY DATE / PERIOD OF VALIDITY:**

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**LIMITED WARRANTY:**

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

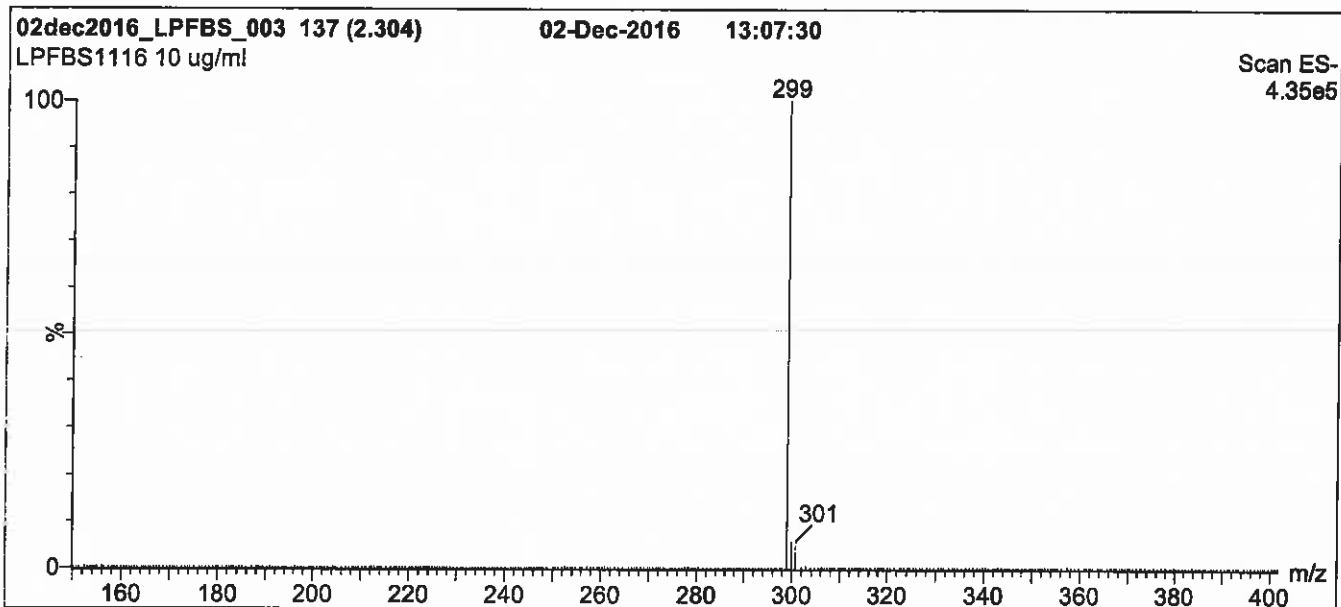
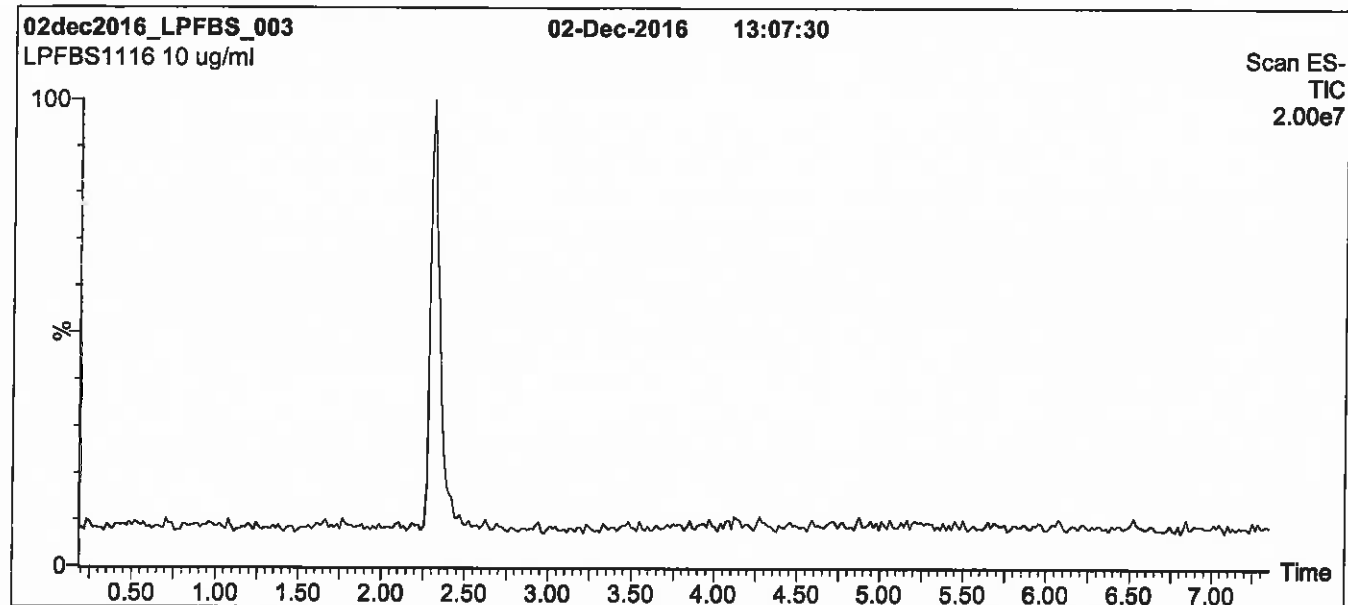
**QUALITY MANAGEMENT:**

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



**\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at [www.well-labs.com](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\***

**Figure 1: L-PFBS; LC/MS Data (TIC and Mass Spectrum)**



**Conditions for Figure 1:**

**LC:** Waters Acquity Ultra Performance LC  
**MS:** Micromass Quattro *micro* API MS

**Chromatographic Conditions**

**Column:** Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

**Mobile phase:** Gradient  
Start: 40% (80:20 MeOH:ACN) / 60% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 7 min and hold for 2 min  
before returning to initial conditions in 0.5 min.  
Time: 10 min

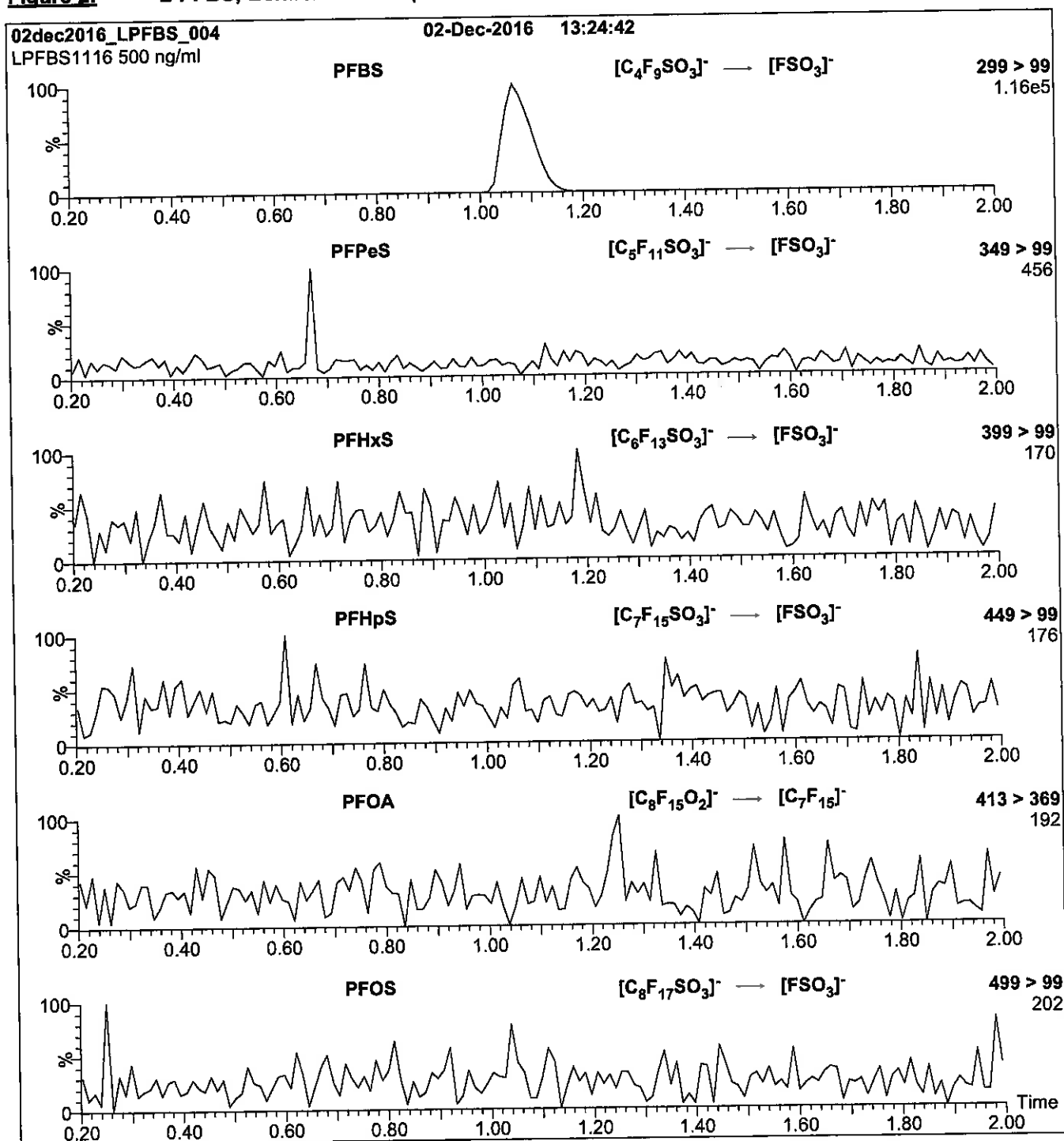
**Flow:** 300  $\mu$ l/min

**MS Parameters**

**Experiment:** Full Scan (150 - 850 amu)

**Source:** Electrospray (negative)  
**Capillary Voltage (kV)** = 2.00  
**Cone Voltage (V)** = 40.00  
**Cone Gas Flow (l/hr)** = 50  
**Desolvation Gas Flow (l/hr)** = 750

**Figure 2: L-PFBS; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu$ l (500 ng/ml L-PFBS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20%  $H_2O$   
(both with 10 mM  $NH_4OAc$  buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

Collision Gas (mbar) = 3.28e-3  
Collision Energy (eV) = 25

Reagent

---

**LCPFHpA\_00009**

P: 9/21/17 SKJ



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

PFHpA

**LOT NUMBER:**

PFHpA1216

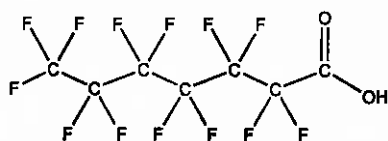
**COMPOUND:**

Perfluoro-n-heptanoic acid

**STRUCTURE:**

**CAS #:**

375-85-9



**MOLECULAR FORMULA:**

$C_7H_2F_{13}O_2$

**MOLECULAR WEIGHT:**

364.06

**CONCENTRATION:**

$50 \pm 2.5 \mu\text{g/ml}$

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

**LAST TESTED:** (mm/dd/yyyy)

12/02/2016

**EXPIRY DATE:** (mm/dd/yyyy)

12/02/2021

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

**DOCUMENTATION/ DATA ATTACHED:**

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

**ADDITIONAL INFORMATION:**

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

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

Certified By:

B.G. Chittim

Date: 12/12/2016

(mm/dd/yyyy)

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



**INTENDED USE:**

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

**HAZARDS:**

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

**SYNTHESIS / CHARACTERIZATION:**

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

**HOMOGENEITY:**

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

**UNCERTAINTY:**

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty,  $u_c(y)$ , of a value  $y$  and the uncertainty of the independent parameters  $x_1, x_2, \dots, x_n$  on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where  $x$  is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

**TRACEABILITY:**

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

**EXPIRY DATE / PERIOD OF VALIDITY:**

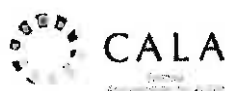
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**LIMITED WARRANTY:**

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

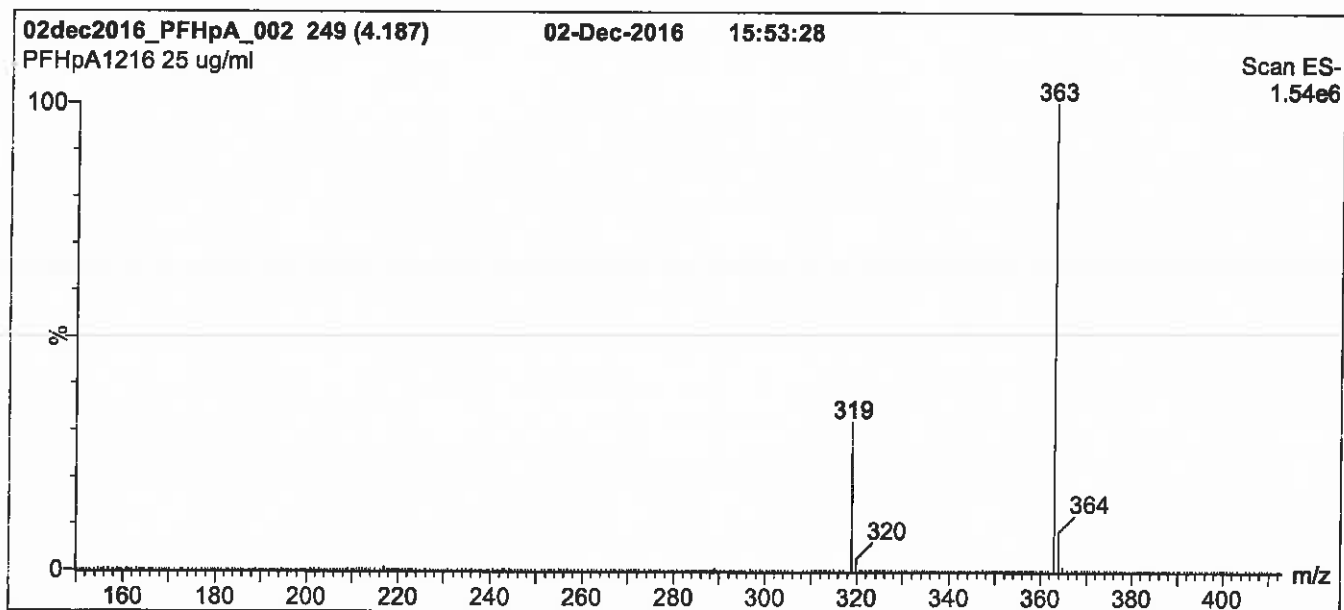
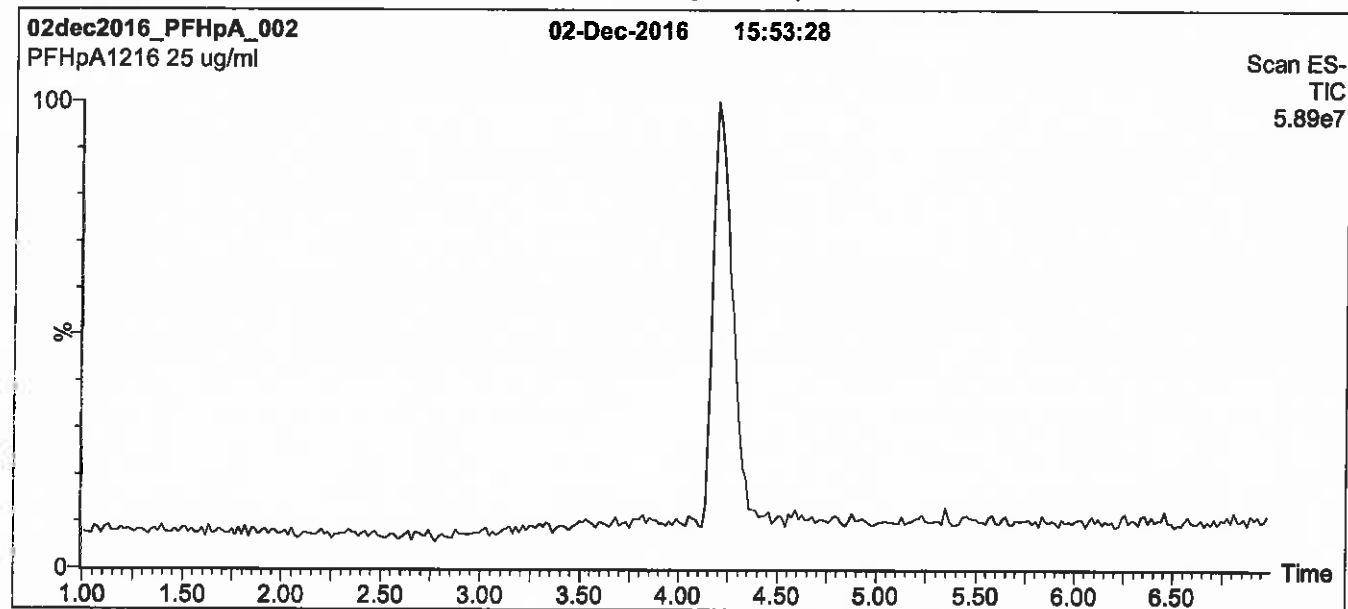
**QUALITY MANAGEMENT:**

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



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**Figure 1: PFHpA; LC/MS Data (TIC and Mass Spectrum)**



**Conditions for Figure 1:**

**LC:** Waters Acquity Ultra Performance LC  
**MS:** Micromass Quattro micro API MS

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient  
Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 7.5 min and hold for  
1.5 min before returning to initial conditions in 0.5 min.  
Time: 10 min

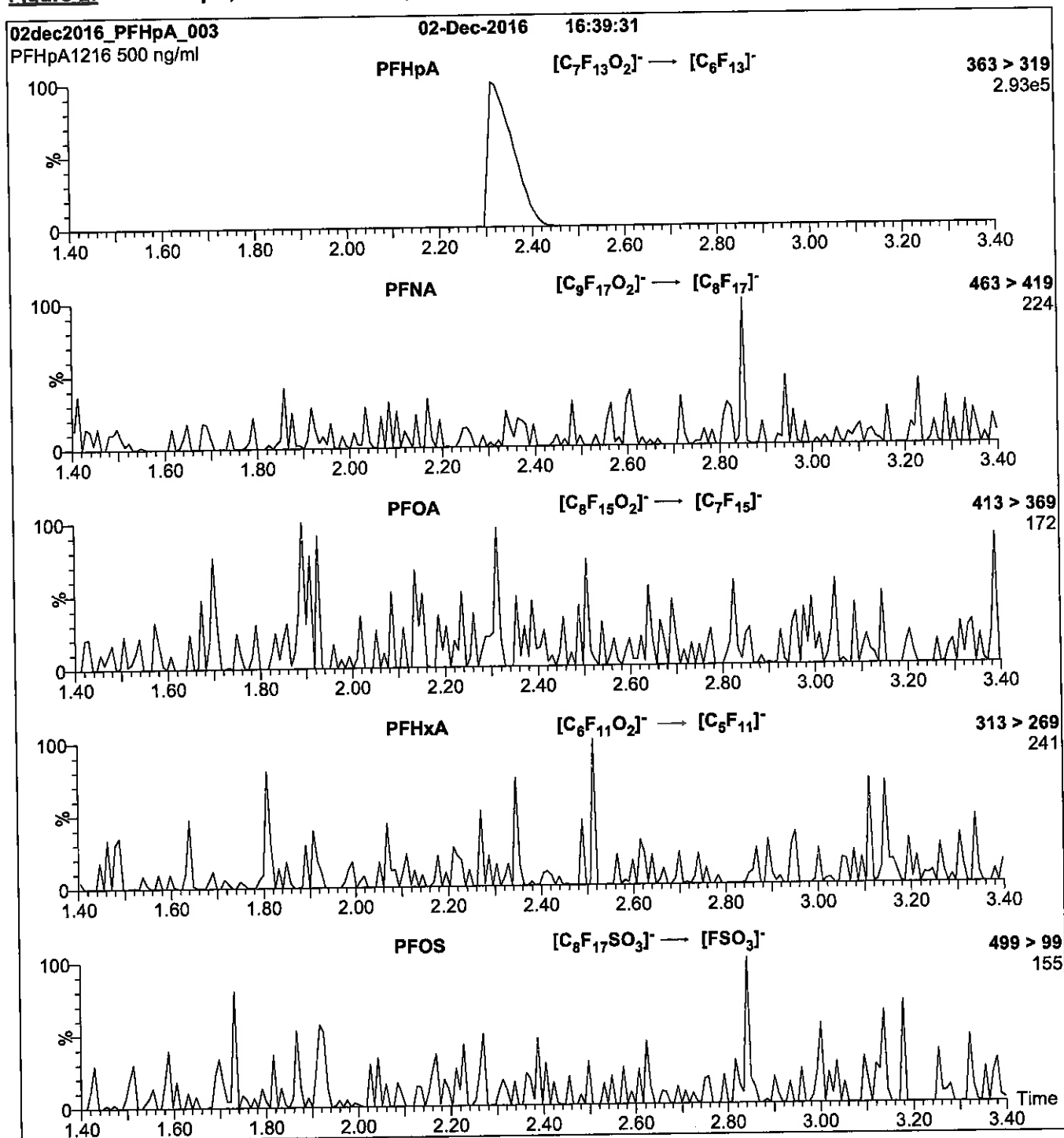
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 2.00  
Cone Voltage (V) = 15.00  
Cone Gas Flow (l/hr) = 50  
Desolvation Gas Flow (l/hr) = 750

**Figure 2: PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu$ l (500 ng/ml PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

Collision Gas (mbar) = 3.50e-3  
Collision Energy (eV) = 11

Reagent

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**LCPFHxS-br\_00005**



**WELLINGTON**  
LABORATORIES

**CERTIFICATE OF ANALYSIS  
DOCUMENTATION**

**br-PFHxSK**

**Potassium Perfluorohexanesulfonate  
Solution/Mixture of Linear and  
Branched Isomers**

|                                           |                                                                                 |
|-------------------------------------------|---------------------------------------------------------------------------------|
| <b><u>PRODUCT CODE:</u></b>               | br-PFHxSK                                                                       |
| <b><u>LOT NUMBER:</u></b>                 | brPFHxSK0117                                                                    |
| <b><u>CONCENTRATION:</u></b>              | 50.0 ± 2.5 µg/ml (total potassium salt)<br>45.5 ± 2.3 µg/ml (total PFHxS anion) |
| <b><u>SOLVENT(S):</u></b>                 | Methanol                                                                        |
| <b><u>DATE PREPARED:</u></b> (mm/dd/yyyy) | 01/03/2017                                                                      |
| <b><u>LAST TESTED:</u></b> (mm/dd/yyyy)   | 01/04/2017                                                                      |
| <b><u>EXPIRY DATE:</u></b> (mm/dd/yyyy)   | 01/04/2022                                                                      |
| <b><u>RECOMMENDED STORAGE:</u></b>        | Store ampoule in a cool, dark place                                             |

**DESCRIPTION:**

The chemical purity has been determined to be ≥98% perfluorohexanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

**DOCUMENTATION/ DATA ATTACHED:**

Table A: Isomeric Components and Percent Composition by <sup>19</sup>F-NMR  
Figure 1: LC/MS Data (TIC and Mass Spectrum)  
Figure 2: LC/MS Data (SIR)  
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

**ADDITIONAL INFORMATION:**

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

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

**INTENDED USE:**

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

**HAZARDS:**

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**SYNTHESIS / CHARACTERIZATION:**

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

**HOMOGENEITY:**

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

**UNCERTAINTY:**

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The combined relative standard uncertainty,  $u_c(y)$ , of a value  $y$  and the uncertainty of the independent parameters

$x_1, x_2, \dots, x_n$  on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where  $x$  is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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**EXPIRY DATE / PERIOD OF VALIDITY:**

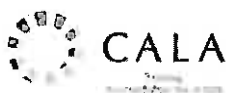
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**LIMITED WARRANTY:**

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**QUALITY MANAGEMENT:**

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\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at [www.well-labs.com](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\*

**Table A: br-PFHxSK; Isomeric Components and Percent Composition (by <sup>19</sup>F-NMR)\***

| Isomer | Name                                                      | Structure                                                                                                                                   | Percent Composition by <sup>19</sup> F-NMR |
|--------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| 1      | Potassium perfluoro-1-hexanesulfonate                     | CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup> | 81.1                                       |
| 2      | Potassium 1-trifluoromethylperfluoropentanesulfonate**    | CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF(SO <sub>3</sub> <sup>-</sup> K <sup>+</sup> )CF <sub>3</sub>             | 2.9                                        |
| 3      | Potassium 2-trifluoromethylperfluoropentanesulfonate      | CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF(CF <sub>3</sub> )CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>             | 1.4                                        |
| 4      | Potassium 3-trifluoromethylperfluoropentanesulfonate      | CF <sub>3</sub> CF <sub>2</sub> CF(CF <sub>3</sub> )CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>             | 5.0                                        |
| 5      | Potassium 4-trifluoromethylperfluoropentanesulfonate      | CF <sub>3</sub> CF(CF <sub>3</sub> )CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>             | 8.9                                        |
| 6      | Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate | CF <sub>3</sub> CF(CF <sub>3</sub> )CF(CF <sub>3</sub> )CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>                         | 0.2                                        |
| 7      | Other Unidentified Isomers                                |                                                                                                                                             | 0.5                                        |

\* Percent of total perfluorohexanesulfonate isomers only.  
\*\* Systematic Name: Potassium perfluorohexane-2-sulfonate.

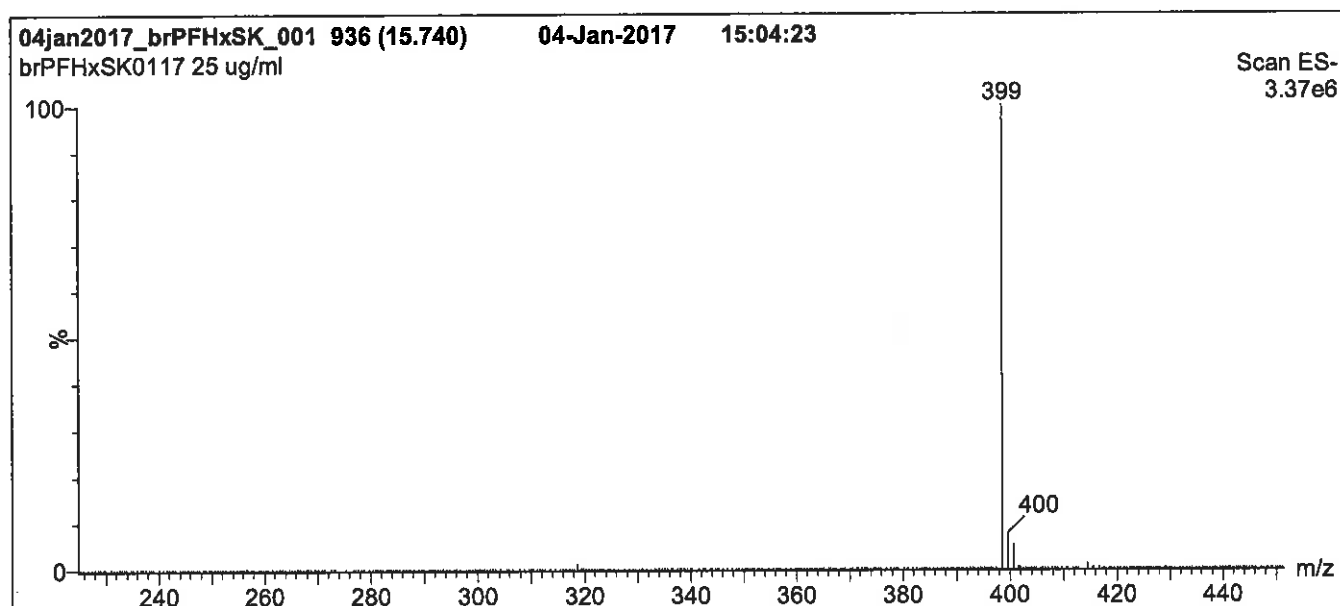
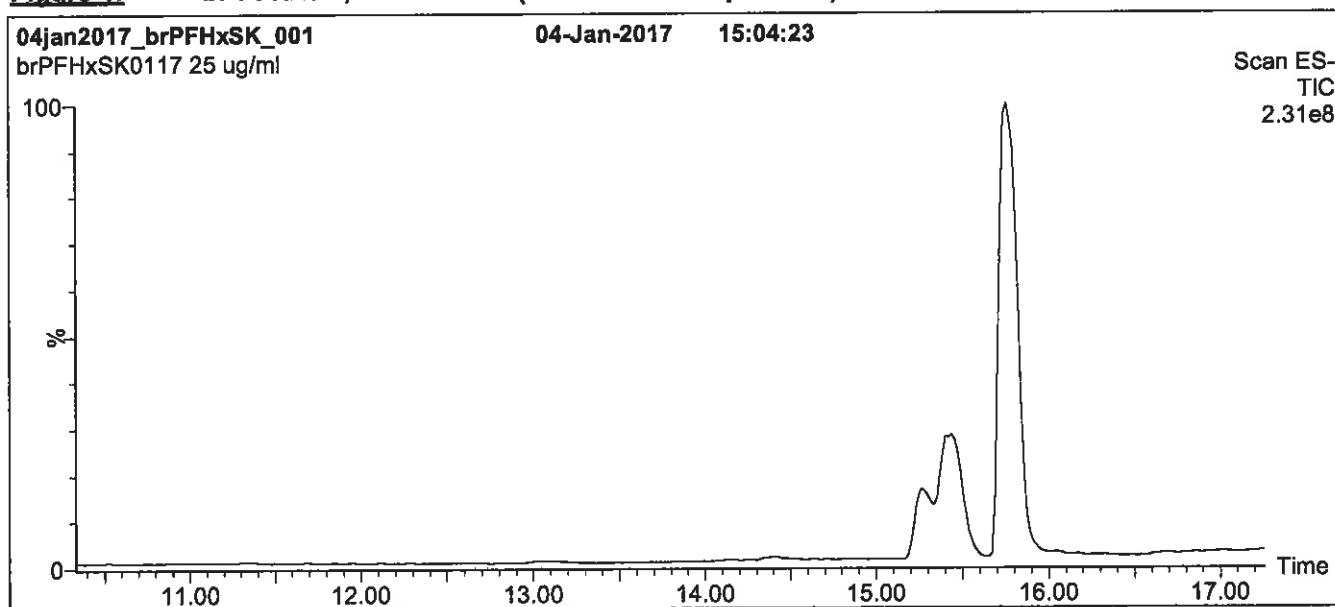
Certified By:

  
B.G. Chittim

Date: 01/20/2017

(mm/dd/yyyy)

**Figure 1:** br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)



**Conditions for Figure 1:**

**LC:** Waters Acquity Ultra Performance LC  
**MS:** Micromass Quattro micro API MS

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient  
Start: 20% (80:20 MeOH:ACN) / 80% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 50% organic over 14 min. Ramp to  
90% organic over 3 min and hold for 1.5 min  
before returning to initial conditions in 0.5 min.  
Time: 20 min

Flow: 300  $\mu$ l/min

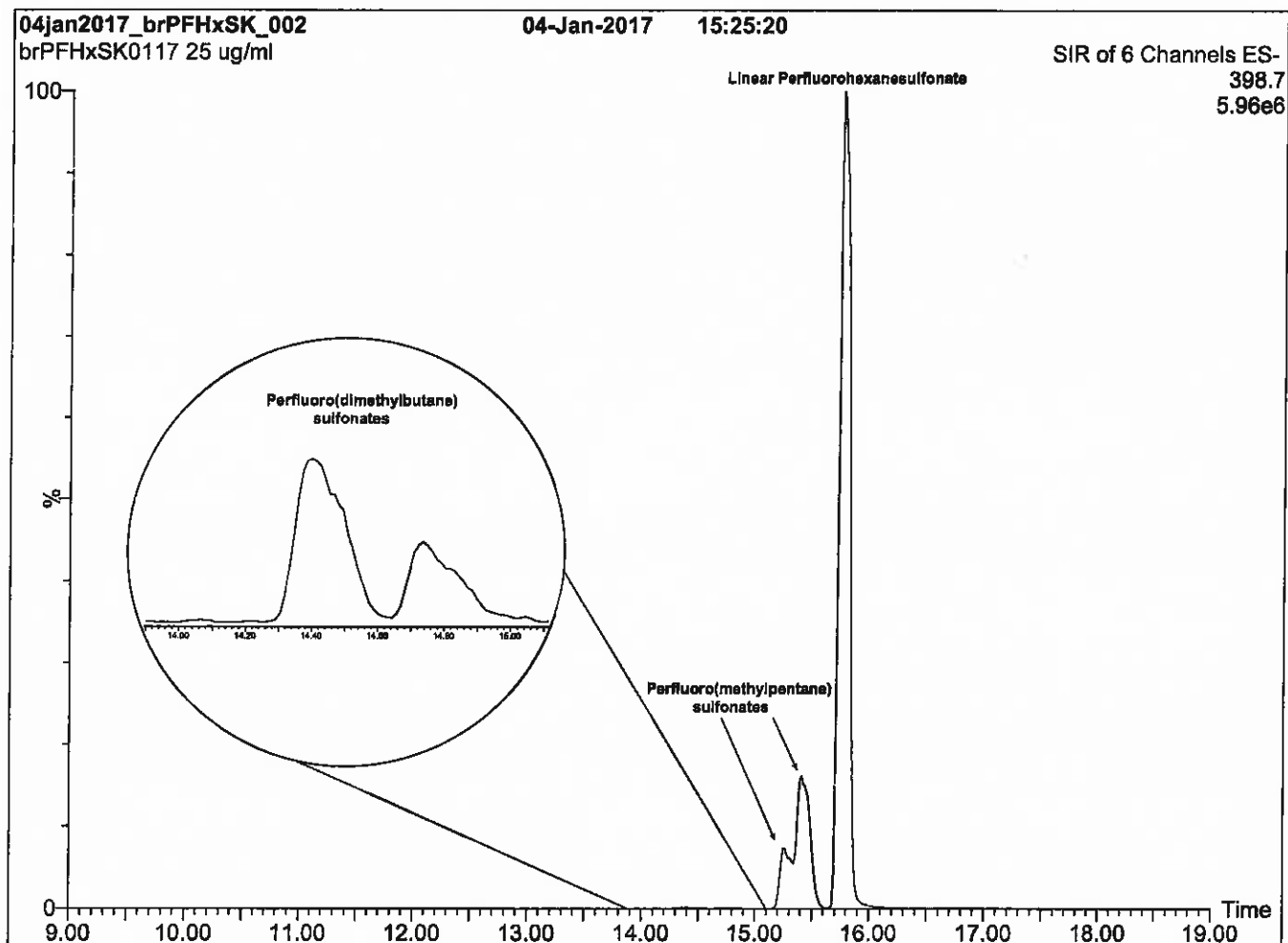
**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 50.00  
Cone Gas Flow (l/hr) = 60  
Desolvation Gas Flow (l/hr) = 750



**Figure 2:** br-PFHxSK; LC/MS Data (SIR)



**Conditions for Figure 2:**

**LC:** Waters Acquity Ultra Performance LC  
**MS:** Micromass Quattro micro API MS

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient  
Start: 20% (80:20 MeOH:ACN) / 80% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 50% organic over 14 min. Ramp to  
90% organic over 3 min and hold for 1.5 min  
before returning to initial conditions in 0.5 min.  
Time: 20 min

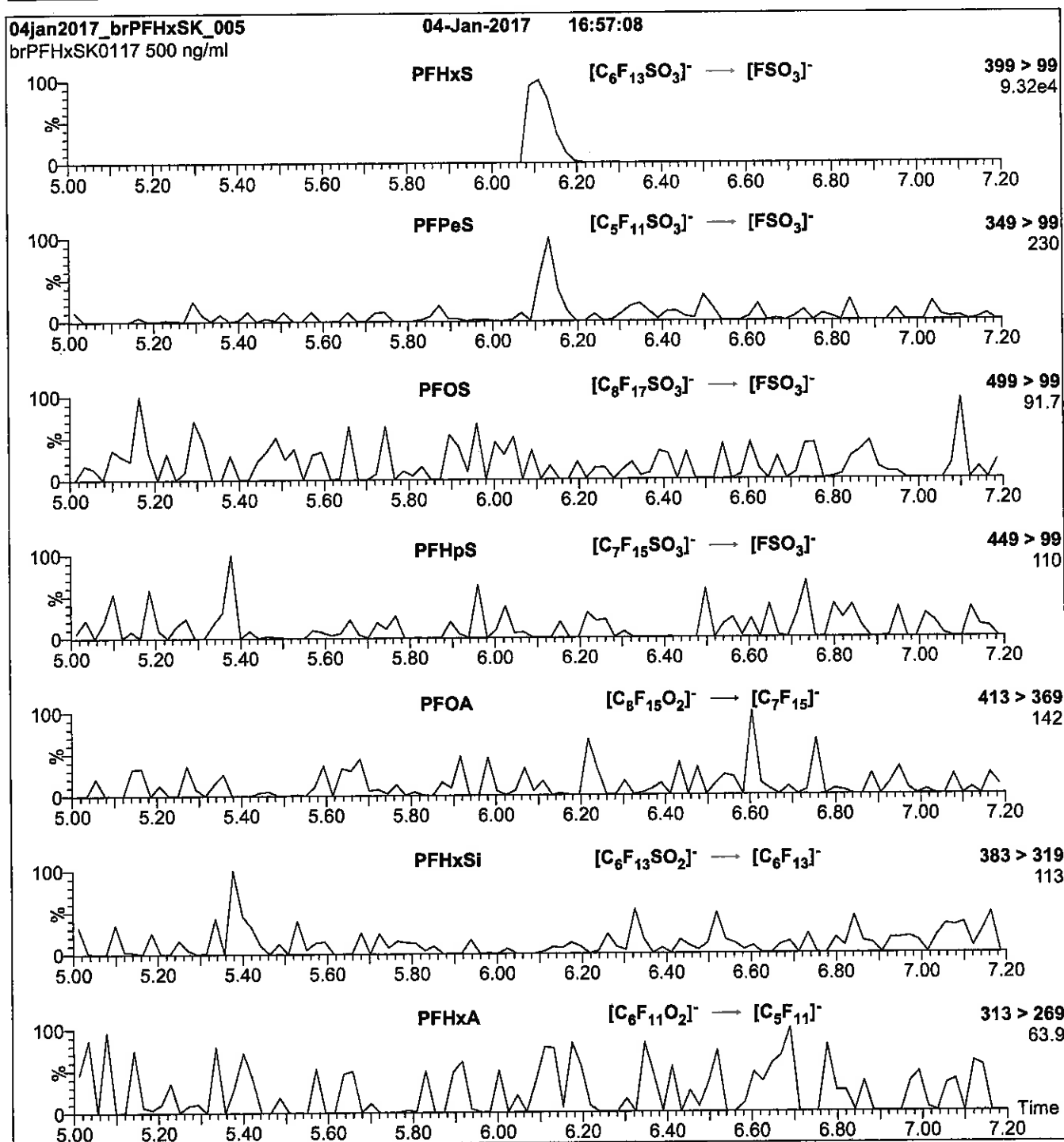
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: SIR (6 channels)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = variable (15-62)  
Cone Gas Flow (l/hr) = 60  
Desolvation Gas Flow (l/hr) = 750

**Figure 3: br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 3:**

Injection: Direct loop injection  
10  $\mu$ l (500 ng/ml br-PFHxSK)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

Collision Gas (mbar) = 3.35e-3  
Collision Energy (eV) = 30

Reagent

---

**LCPFNA\_00009**

r: 9/2/17 skv



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

PFNA

**LOT NUMBER:**

PFNA0717

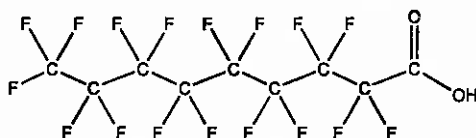
**COMPOUND:**

Perfluoro-n-nonanoic acid

**STRUCTURE:**

**CAS #:**

375-95-1



**MOLECULAR FORMULA:**

$C_9H_{17}O_2$

**MOLECULAR WEIGHT:**

464.08

**CONCENTRATION:**

$50 \pm 2.5 \mu\text{g/ml}$

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

**LAST TESTED:** (mm/dd/yyyy)

07/20/2017

**EXPIRY DATE:** (mm/dd/yyyy)

07/20/2022

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

**DOCUMENTATION/ DATA ATTACHED:**

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

**ADDITIONAL INFORMATION:**

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA), < 0.1% of perfluoro-n-heptanoic acid (PFHpA), and < 0.1% of perfluoro-n-undecanoic acid (PFUdA).

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

Certified By:

B.G. Chittim, General Manager

Date: 07/24/2017

(mm/dd/yyyy)

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

**INTENDED USE:**

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

**HAZARDS:**

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

**SYNTHESIS / CHARACTERIZATION:**

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The combined relative standard uncertainty,  $u_c(y)$ , of a value  $y$  and the uncertainty of the independent parameters

$x_1, x_2, \dots, x_n$  on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where  $x$  is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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**LIMITED WARRANTY:**

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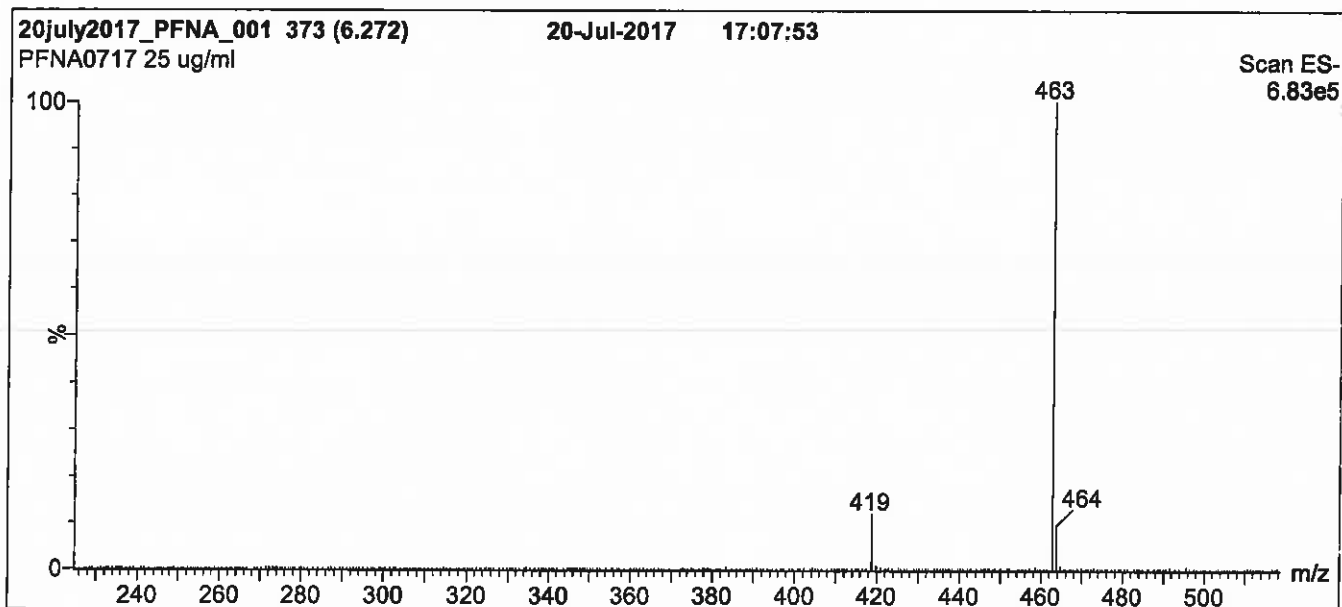
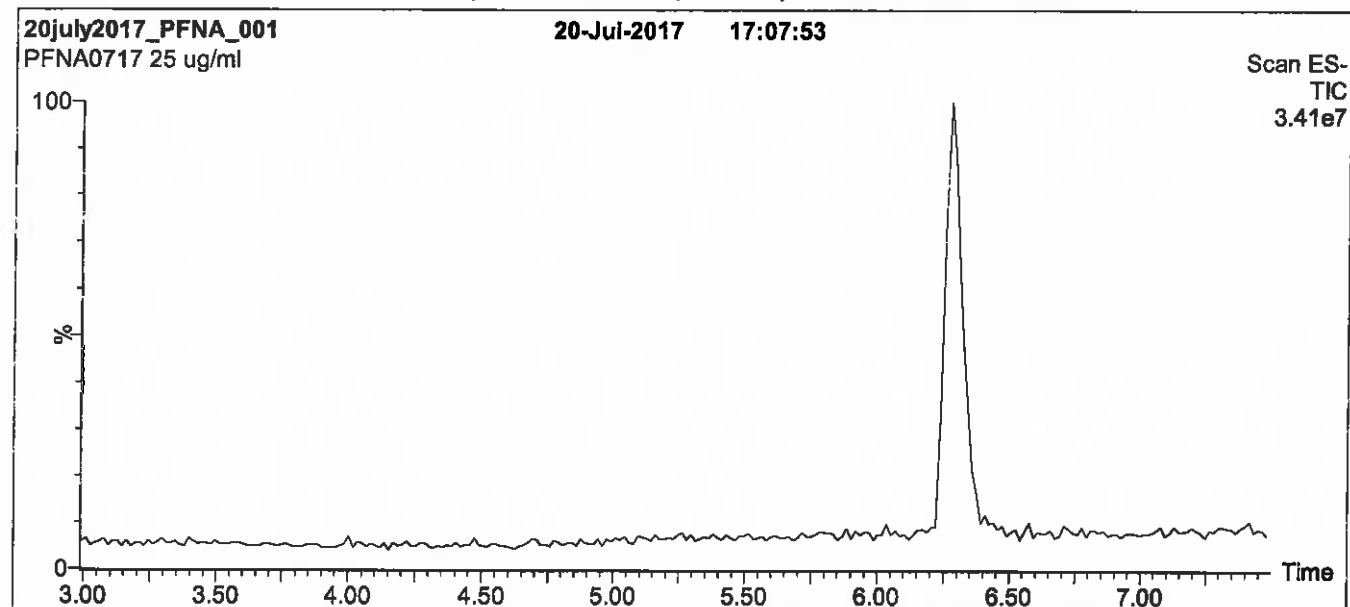
**QUALITY MANAGEMENT:**

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at [www.well-labs.com](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\*

**Figure 1: PFNA; LC/MS Data (TIC and Mass Spectrum)**



**Conditions for Figure 1:**

**LC:** Waters Acquity Ultra Performance LC  
**MS:** Micromass Quattro micro API MS

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)

Hold for 1 min. Ramp to 90% organic over 7 min and hold  
for 1 min before returning to initial conditions in 0.5 min.  
Time: 10 min

Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)

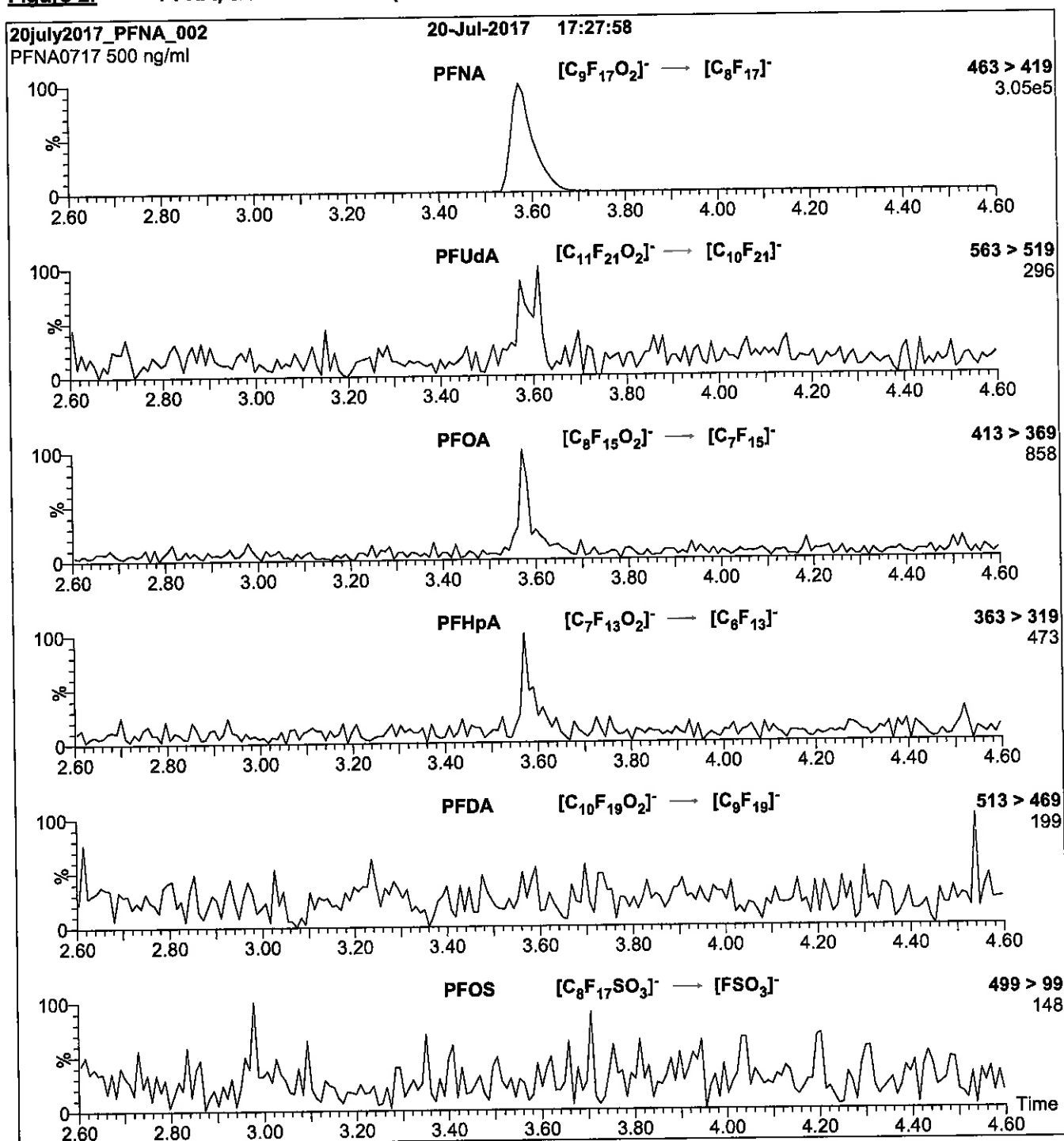
Capillary Voltage (kV) = 2.00

Cone Voltage (V) = 15.00

Cone Gas Flow (l/hr) = 50

Desolvation Gas Flow (l/hr) = 750

**Figure 2: PFNA; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu$ l (500 ng/ml PFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

Collision Gas (mbar) = 3.50e-3  
Collision Energy (eV) = 11

Reagent

---

**LCPFOA\_00010**



P: 10/2017 SKV



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

PFOA

**LOT NUMBER:**

PFOA0917

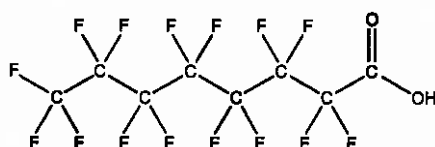
**COMPOUND:**

Perfluoro-n-octanoic acid

**STRUCTURE:**

**CAS #:**

335-67-1



**MOLECULAR FORMULA:**

$C_8H_{15}O_2$

**MOLECULAR WEIGHT:**

414.07

**CONCENTRATION:**

$50 \pm 2.5 \mu\text{g/ml}$

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

**LAST TESTED:** (mm/dd/yyyy)

09/27/2017

**EXPIRY DATE:** (mm/dd/yyyy)

09/27/2022

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

**DOCUMENTATION/ DATA ATTACHED:**

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

**ADDITIONAL INFORMATION:**

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

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

**Certified By:**

  
B.G. Chittim, General Manager

**Date:** 09/28/2017

(mm/dd/yyyy)

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

**INTENDED USE:**

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

**HAZARDS:**

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

**SYNTHESIS / CHARACTERIZATION:**

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**HOMOGENEITY:**

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

**UNCERTAINTY:**

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The combined relative standard uncertainty,  $u_c(y)$ , of a value  $y$  and the uncertainty of the independent parameters

$x_1, x_2, \dots, x_n$  on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where  $x$  is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

**TRACEABILITY:**

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**EXPIRY DATE / PERIOD OF VALIDITY:**

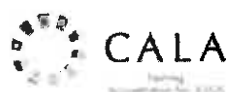
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**LIMITED WARRANTY:**

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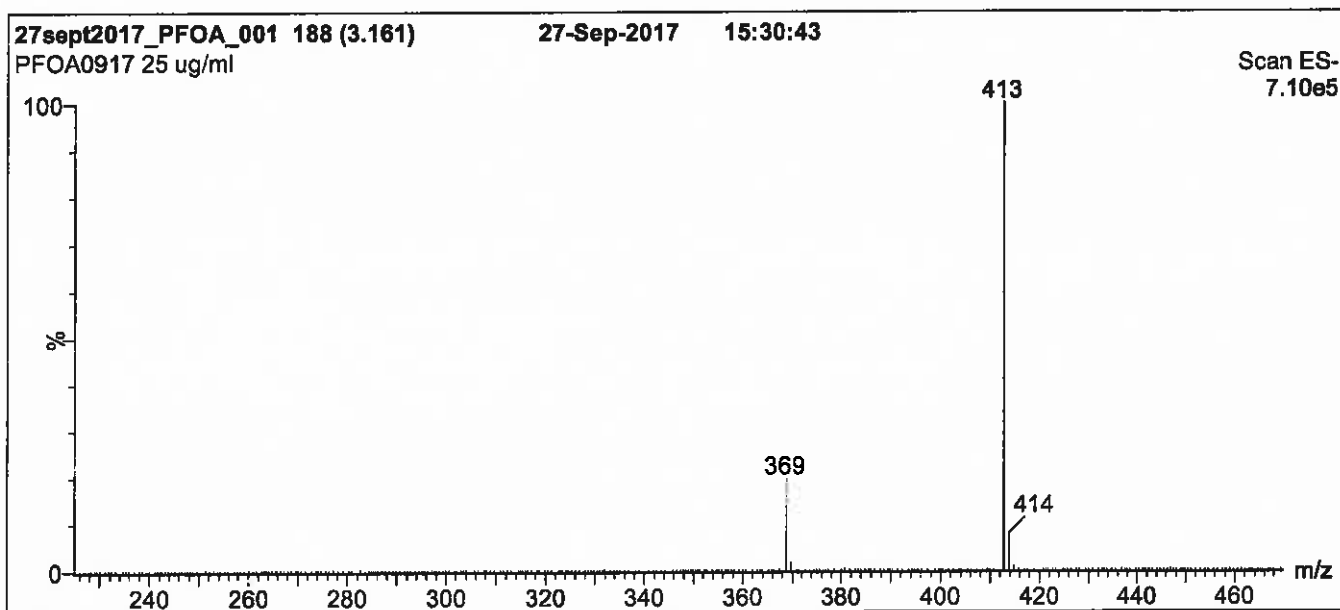
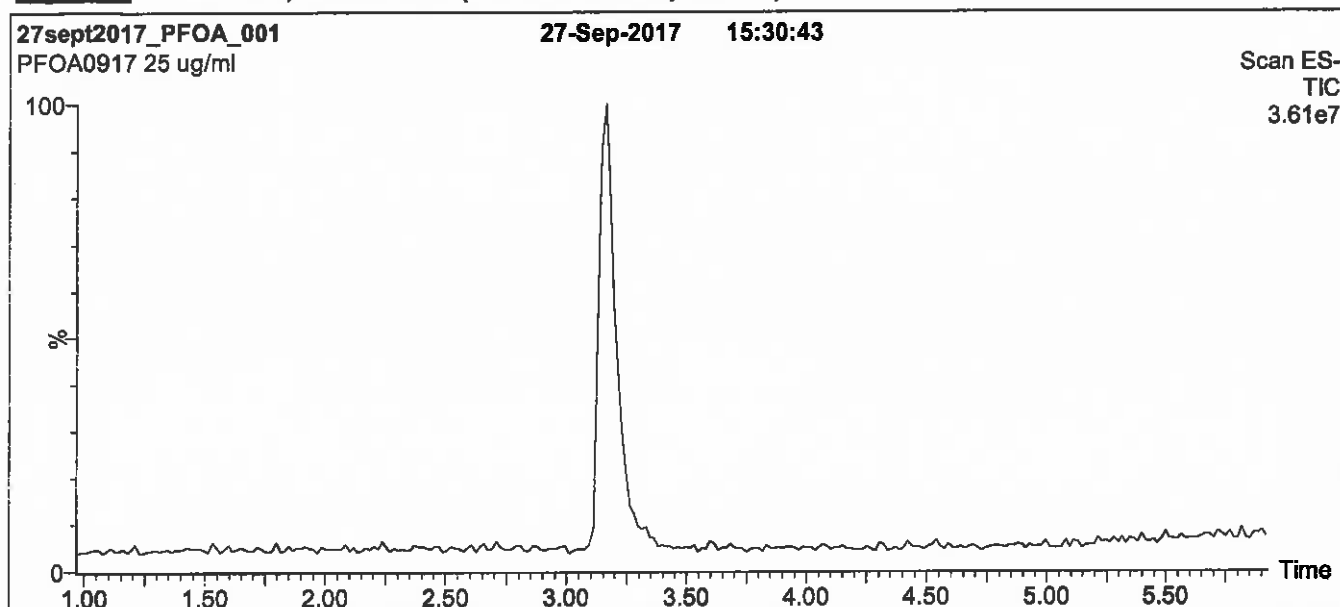
**QUALITY MANAGEMENT:**

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**Figure 1: PFOA; LC/MS Data (TIC and Mass Spectrum)**



**Conditions for Figure 1:**

**LC:** Waters Acquity Ultra Performance LC  
**MS:** Micromass Quattro *micro* API MS

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient  
Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 7 min and hold for  
2 min before returning to initial conditions in 0.5 min.  
Time: 10 min

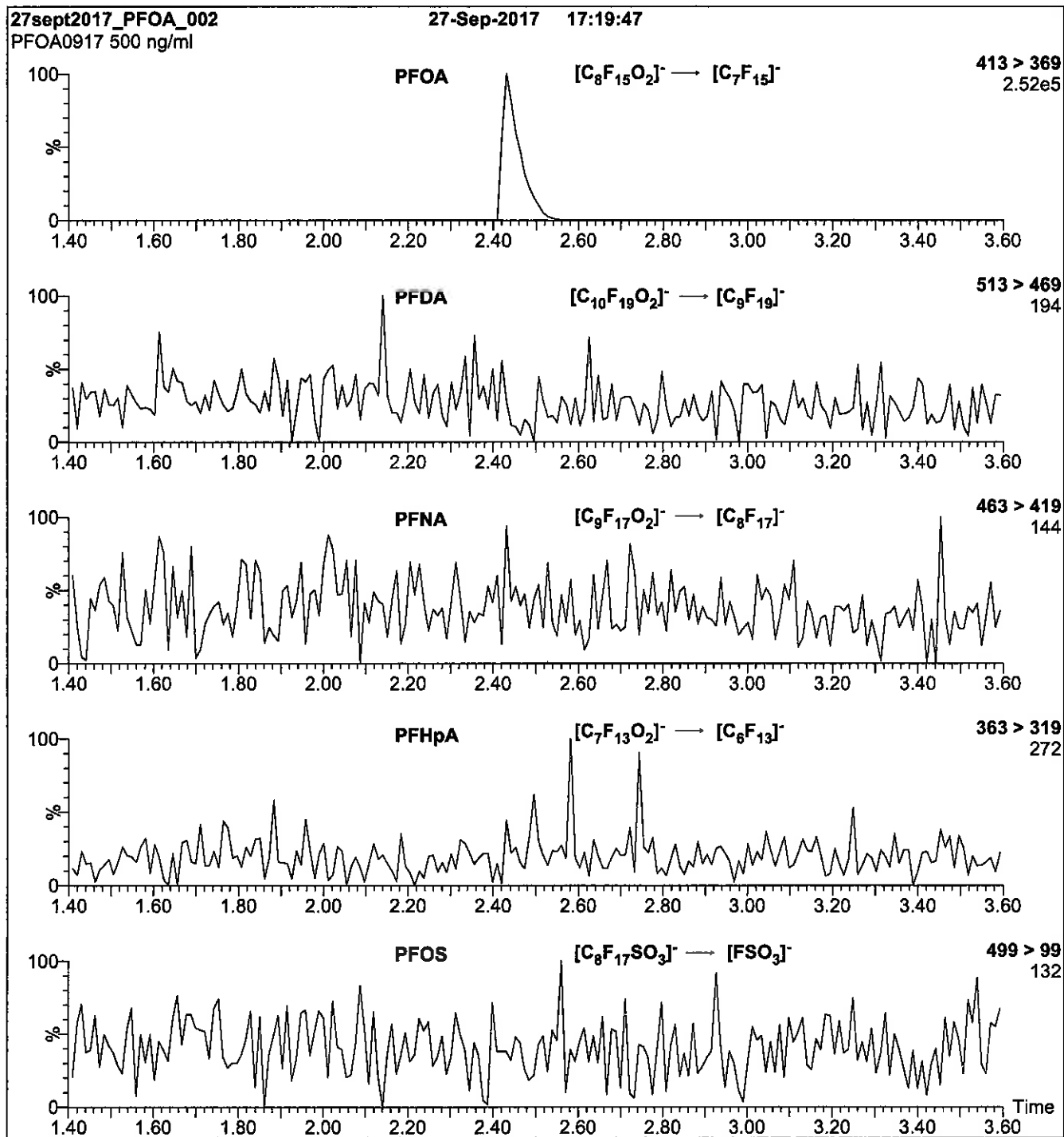
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 15.00  
Cone Gas Flow (l/hr) = 100  
Desolvation Gas Flow (l/hr) = 750

**Figure 2: PFOA; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu$ l (500 ng/ml PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

Collision Gas (mbar) = 3.46e-3  
Collision Energy (eV) = 11

Reagent

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**LCPFOS-br\_00005**

P: 10/2017 SKV



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

### br-PFOSK

#### Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

|                                    |                                                                              |
|------------------------------------|------------------------------------------------------------------------------|
| <b>PRODUCT CODE:</b>               | br-PFOSK                                                                     |
| <b>LOT NUMBER:</b>                 | brPFOSK0117                                                                  |
| <b>CONCENTRATION:</b>              | 50 ± 2.5 µg/ml (total potassium salt)<br>46.4 ± 2.3 µg/ml (total PFOS anion) |
| <b>SOLVENT(S):</b>                 | Methanol                                                                     |
| <b>DATE PREPARED:</b> (mm/dd/yyyy) | 01/09/2017                                                                   |
| <b>LAST TESTED:</b> (mm/dd/yyyy)   | 01/12/2017                                                                   |
| <b>EXPIRY DATE:</b> (mm/dd/yyyy)   | 01/12/2022                                                                   |
| <b>RECOMMENDED STORAGE:</b>        | Store ampoule in a cool, dark place                                          |

### DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

### DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by <sup>19</sup>F-NMR  
Figure 1: LC/MS Data (TIC and Mass Spectrum)  
Figure 2: LC/MS Data (SIR)  
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

### ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA  
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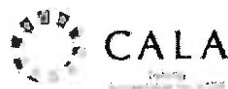
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**Table A: br-PFOSK; Isomeric Components and Percent Composition (by <sup>19</sup>F-NMR)\***

| Isomer | Name                                                      | Structure                                                                                                                                                   | Percent Composition by <sup>19</sup> F-NMR |
|--------|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| 1      | Potassium perfluoro-1-octanesulfonate                     | CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup> | 78.8                                       |
| 2      | Potassium 1-trifluoromethylperfluoroheptanesulfonate**    | CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>3</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup> | 1.2                                        |
| 3      | Potassium 2-trifluoromethylperfluoroheptanesulfonate      | CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF(CF <sub>3</sub> )SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>             | 0.6                                        |
| 4      | Potassium 3-trifluoromethylperfluoroheptanesulfonate      | CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF(CF <sub>3</sub> )CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>             | 1.9                                        |
| 5      | Potassium 4-trifluoromethylperfluoroheptanesulfonate      | CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF(CF <sub>3</sub> )CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>             | 2.2                                        |
| 6      | Potassium 5-trifluoromethylperfluoroheptanesulfonate      | CF <sub>3</sub> CF <sub>2</sub> CF(CF <sub>3</sub> )CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>             | 4.5                                        |
| 7      | Potassium 6-trifluoromethylperfluoroheptanesulfonate      | CF <sub>3</sub> CF(CF <sub>3</sub> )CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>             | 10.0                                       |
| 8      | Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate | CF <sub>3</sub> CF(CF <sub>3</sub> )CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>                             | 0.2                                        |
| 9      | Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate | CF <sub>3</sub> CF <sub>2</sub> CF(CF <sub>3</sub> )CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>                             | 0.03                                       |
| 10     | Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate | CF <sub>3</sub> CF(CF <sub>3</sub> )CF(CF <sub>3</sub> )CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>                         | 0.4                                        |
| 11     | Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate | CF <sub>3</sub> CF(CF <sub>3</sub> )CF <sub>2</sub> CF(CF <sub>3</sub> )CF <sub>2</sub> SO <sub>3</sub> <sup>-</sup> K <sup>+</sup>                         | 0.07                                       |

\* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.

\*\* Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By:

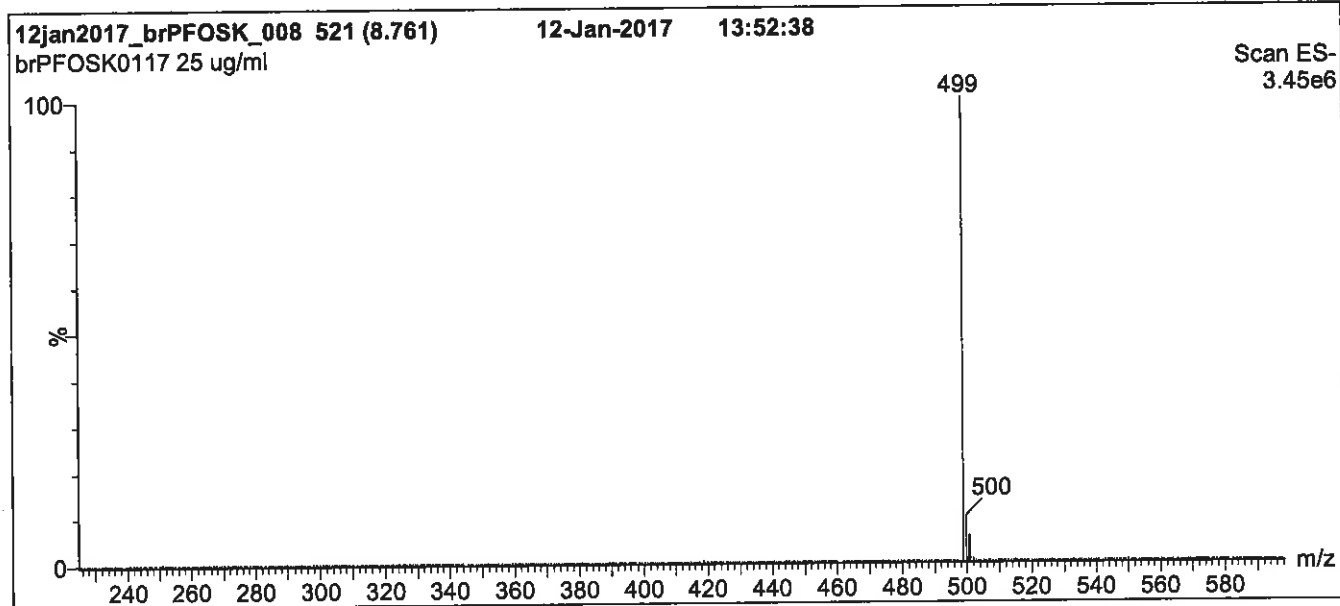
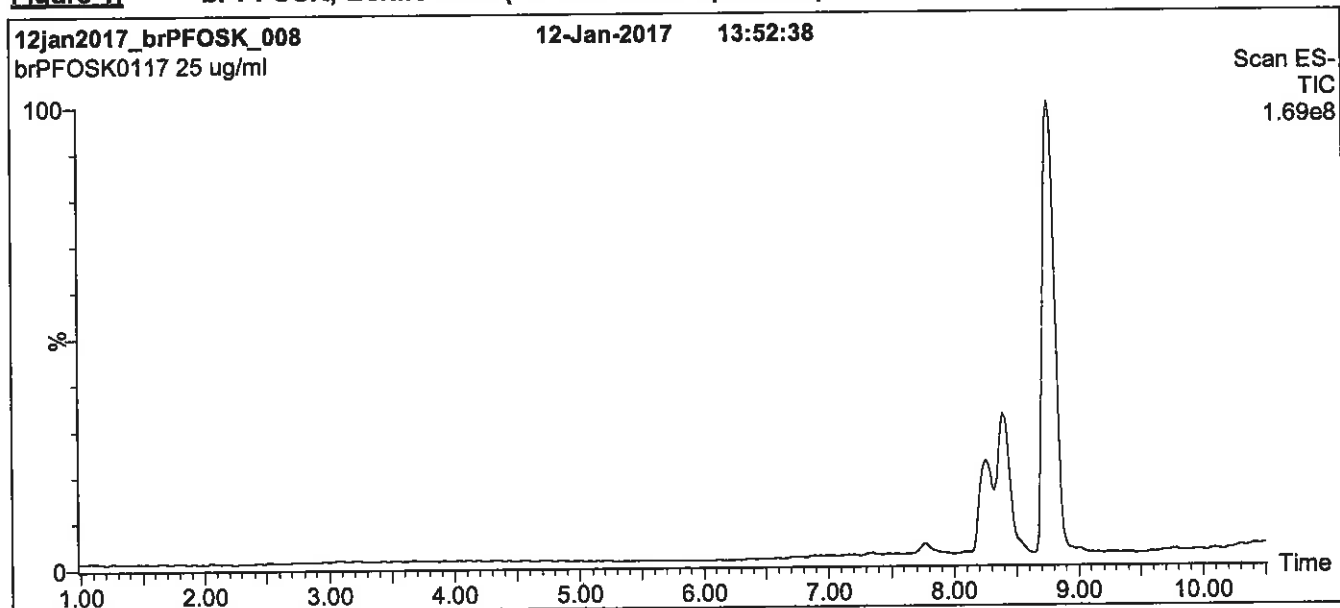
  
B.G. Chittim

Date: 01/20/2017

(mm/dd/yyyy)



**Figure 1: br-PFOSK; LC/MS Data (TIC and Mass Spectrum)**



**Conditions for Figure 1:**

**LC:** Waters Acquity Ultra Performance LC  
**MS:** Micromass Quattro *micro* API MS

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 45% (80:20 MeOH:ACN) / 55% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 12 min and hold for 2 min.  
Return to initial conditions over 0.5 min.  
Time: 16 min

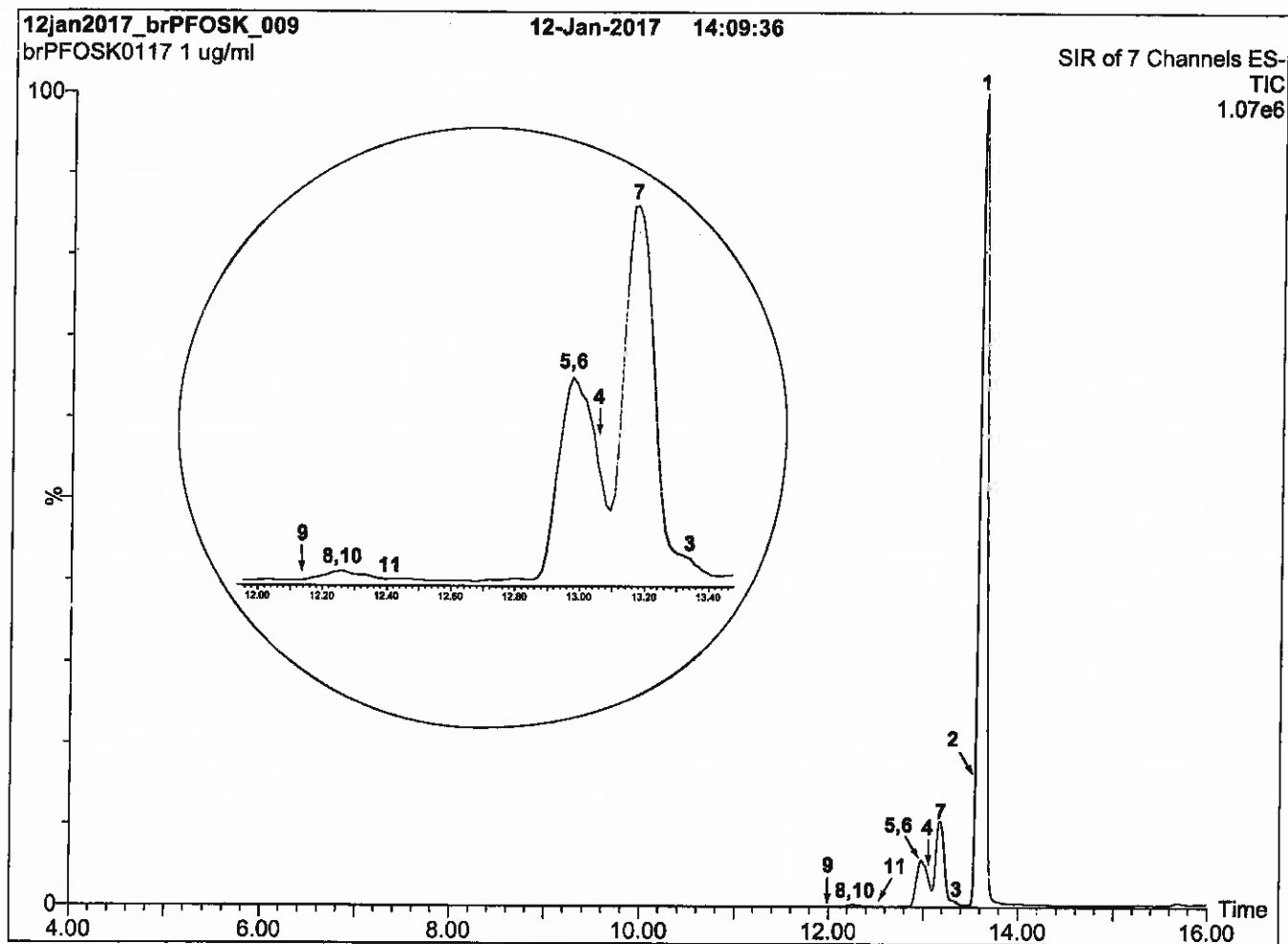
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 60.00  
Cone Gas Flow (l/hr) = 50  
Desolvation Gas Flow (l/hr) = 750

**Figure 2:** br-PFOSK; LC/MS Data (SIR)



**Conditions for Figure 2:**

**LC:** Waters Acquity Ultra Performance LC  
**MS:** Micromass Quattro *micro* API MS

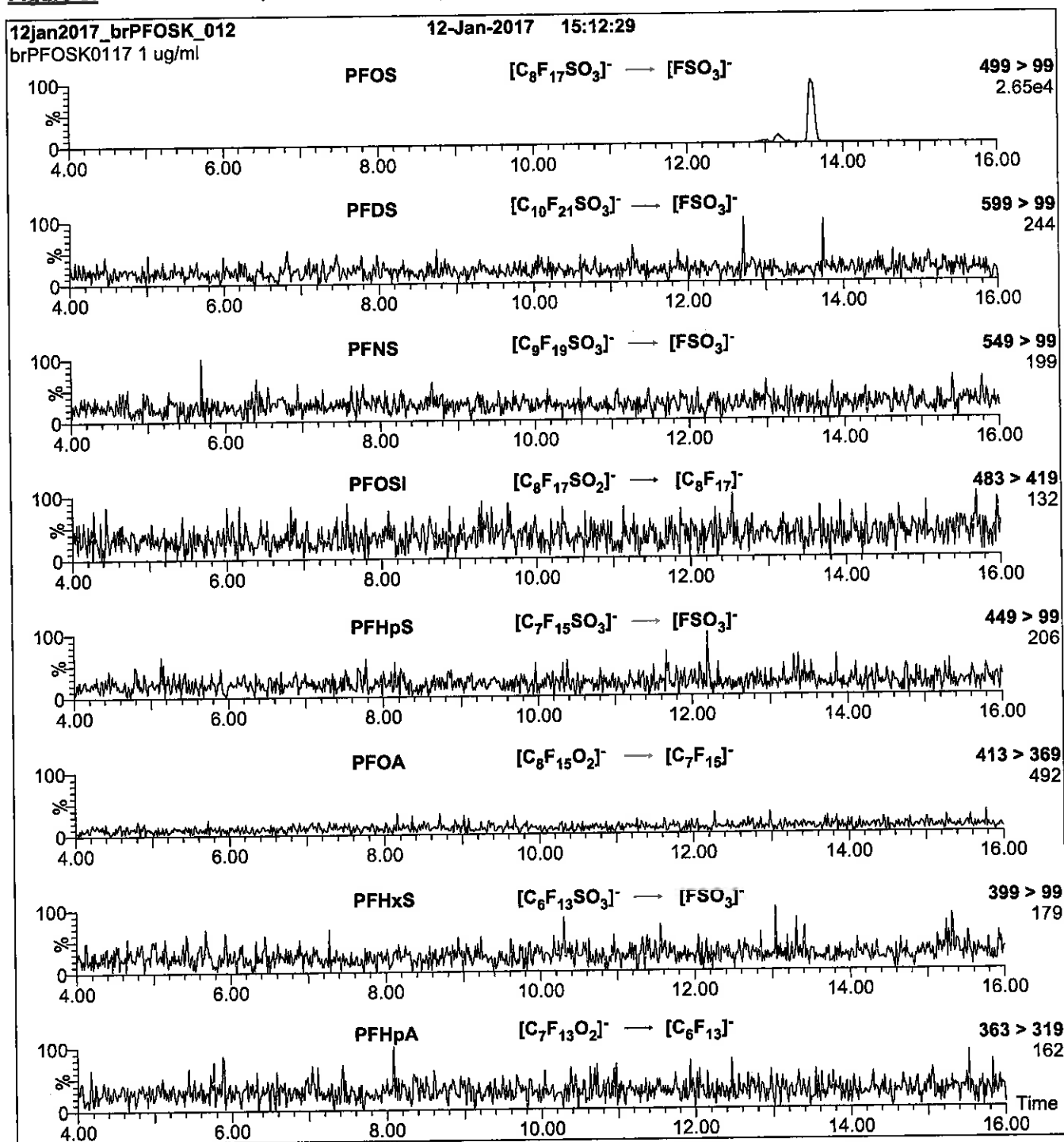
**Chromatographic Conditions:**

**Column:** Acquity UPLC BEH Shield RP<sub>18</sub> (1.7  $\mu$ m, 2.1 x 100 mm)  
**Injection:** 1.0  $\mu$ g/ml of br-PFOSK  
**Mobile Phase:** Gradient  
45% (80:20 MeOH:ACN) / 55% H<sub>2</sub>O (both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 15 min and hold for 3 min.  
Return to initial conditions over 1 min.  
Time: 20 min  
**Flow:** 300  $\mu$ l/min

**MS Conditions:**

SIR (ES)  
Source = 110 °C  
Desolvation = 325 °C  
Cone Voltage = 60V

**Figure 3: br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 3:**

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300  $\mu$ l/min

**MS Parameters**

Collision Gas (mbar) = 3.31e-3

Collision Energy (eV) = 11-50 (variable)

# Method 537 DOD

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Perfluorinated Alkyl Acids (LC/MS)  
by Method 537 DOD

FORM II  
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

| Client Sample ID            | Lab Sample ID         | PFHxA # | PFDA # |
|-----------------------------|-----------------------|---------|--------|
| WGNA-073118-RW-378<br>5     | 320-41679-1           | 88      | 103    |
| WGNA-073118-FRB-37<br>85    | 320-41679-2           | 86      | 97     |
| NAWC-073118-RW-154          | 320-41679-3           | 80      | 94     |
| NAWC-073118-FRB-15<br>4     | 320-41679-4           | 86      | 98     |
| NAWC-073118-RW-185          | 320-41679-5           | 81      | 94     |
| NAWC-073118-FRB-18<br>5     | 320-41679-6           | 98      | 103    |
| NAWC-073118-RW-179          | 320-41679-7           | 87      | 101    |
| NAWC-073118-FRB-17<br>9     | 320-41679-8           | 87      | 101    |
| NAWC-073118-RW-124          | 320-41679-9           | 83      | 94     |
| NAWC-073118-FRB-12<br>4     | 320-41679-10          | 87      | 91     |
| WGNA-073118-RW-310<br>3     | 320-41679-11          | 90      | 99     |
| WGNA-073118-FRB-31<br>03    | 320-41679-12          | 85      | 92     |
|                             | MB<br>320-237969/1-A  | 90      | 95     |
|                             | LCS<br>320-237969/2-A | 88      | 94     |
| WGNA-073118-RW-378<br>5 MS  | 320-41679-1 MS        | 90      | 98     |
| WGNA-073118-RW-378<br>5 MSD | 320-41679-1 MSD       | 86      | 99     |

PFHxA = 13C2 PFHxA  
PFDA = 13C2 PFDA

QC LIMITS  
70-130  
70-130

# Column to be used to flag recovery values

FORM III  
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2018.08.07\_537C\_024.d  
 Lab ID: LCS 320-237969/2-A Client ID: \_\_\_\_\_

| COMPOUND                             | SPIKE<br>ADDED<br>(ng/L) | LCS<br>CONCENTRATION<br>(ng/L) | LCS<br>%<br>REC | QC<br>LIMITS<br>REC | # |
|--------------------------------------|--------------------------|--------------------------------|-----------------|---------------------|---|
| Perfluorooctanesulfonic acid (PFOS)  | 132                      | 138                            | 104             | 70-130              |   |
| Perfluorooctanoic acid (PFOA)        | 66.0                     | 68.3                           | 103             | 70-130              |   |
| Perfluorononanoic acid (PFNA)        | 66.0                     | 64.4                           | 98              | 70-130              |   |
| Perfluorohexanesulfonic acid (PFHxS) | 100                      | 107                            | 107             | 70-130              |   |
| Perfluoroheptanoic acid (PFHpA)      | 32.0                     | 32.1                           | 100             | 70-130              |   |
| Perfluorobutanesulfonic acid (PFBS)  | 300                      | 321                            | 107             | 70-130              |   |

# Column to be used to flag recovery and RPD values

FORM III  
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2018.08.07\_537C\_026.d  
 Lab ID: 320-41679-1 MS Client ID: WGNA-073118-RW-3785 MS

| COMPOUND                             | SPIKE<br>ADDED<br>(ng/L) | SAMPLE<br>CONCENTRATION<br>(ng/L) | MS<br>CONCENTRATION<br>(ng/L) | MS<br>%<br>REC | QC<br>LIMITS<br>REC | # |
|--------------------------------------|--------------------------|-----------------------------------|-------------------------------|----------------|---------------------|---|
| Perfluorooctanesulfonic acid (PFOS)  | 131                      | 11 J                              | 146                           | 103            | 70-130              |   |
| Perfluorooctanoic acid (PFOA)        | 65.8                     | 16 J                              | 79.2                          | 97             | 70-130              |   |
| Perfluorononanoic acid (PFNA)        | 65.8                     | 21 U                              | 64.8                          | 99             | 70-130              |   |
| Perfluorohexanesulfonic acid (PFHxS) | 99.8                     | 15 J                              | 118                           | 103            | 70-130              |   |
| Perfluoroheptanoic acid (PFHpA)      | 31.9                     | 5.9 J                             | 34.3                          | 89             | 70-130              |   |
| Perfluorobutanesulfonic acid (PFBS)  | 299                      | 37 U                              | 325                           | 109            | 70-130              |   |

# Column to be used to flag recovery and RPD values

FORM III  
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2018.08.07\_537C\_027.d  
 Lab ID: 320-41679-1 MSD Client ID: WGNA-073118-RW-3785 MSD

| COMPOUND                             | SPIKE<br>ADDED<br>(ng/L) | MSD<br>CONCENTRATION<br>(ng/L) | MSD<br>%<br>REC | %<br>RPD | QC LIMITS |        | # |
|--------------------------------------|--------------------------|--------------------------------|-----------------|----------|-----------|--------|---|
|                                      |                          |                                |                 |          | RPD       | REC    |   |
| Perfluorooctanesulfonic acid (PFOS)  | 135                      | 151                            | 104             | 3        | 30        | 70-130 |   |
| Perfluorooctanoic acid (PFOA)        | 67.8                     | 80.0                           | 95              | 1        | 30        | 70-130 |   |
| Perfluorononanoic acid (PFNA)        | 67.8                     | 65.2                           | 96              | 1        | 30        | 70-130 |   |
| Perfluorohexanesulfonic acid (PFHxS) | 103                      | 120                            | 103             | 2        | 30        | 70-130 |   |
| Perfluoroheptanoic acid (PFHpA)      | 32.9                     | 35.1                           | 89              | 2        | 30        | 70-130 |   |
| Perfluorobutanesulfonic acid (PFBS)  | 308                      | 335                            | 109             | 3        | 30        | 70-130 |   |

# Column to be used to flag recovery and RPD values



FORM IV  
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Lab File ID: 2018.08.07\_537C\_023.d Lab Sample ID: MB 320-237969/1-A  
 Matrix: Water Date Extracted: 08/04/2018 08:24  
 Instrument ID: A8\_N Date Analyzed: 08/08/2018 04:40  
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

| CLIENT SAMPLE ID        | LAB SAMPLE ID      | LAB<br>FILE ID        | DATE ANALYZED    |
|-------------------------|--------------------|-----------------------|------------------|
|                         | LCS 320-237969/2-A | 2018.08.07_537C 024.d | 08/08/2018 04:45 |
| WGNA-073118-RW-3785     | 320-41679-1        | 2018.08.07_537C 025.d | 08/08/2018 04:50 |
| WGNA-073118-RW-3785 MS  | 320-41679-1 MS     | 2018.08.07_537C 026.d | 08/08/2018 04:55 |
| WGNA-073118-RW-3785 MSD | 320-41679-1 MSD    | 2018.08.07_537C 027.d | 08/08/2018 04:59 |
| WGNA-073118-FRB-3785    | 320-41679-2        | 2018.08.07_537C 028.d | 08/08/2018 05:04 |
| NAWC-073118-RW-154      | 320-41679-3        | 2018.08.07_537C 029.d | 08/08/2018 05:09 |
| NAWC-073118-FRB-154     | 320-41679-4        | 2018.08.07_537C 030.d | 08/08/2018 05:13 |
| NAWC-073118-RW-185      | 320-41679-5        | 2018.08.07_537C 031.d | 08/08/2018 05:18 |
| NAWC-073118-FRB-185     | 320-41679-6        | 2018.08.07_537C 032.d | 08/08/2018 05:23 |
| NAWC-073118-RW-179      | 320-41679-7        | 2018.08.07_537C 035.d | 08/08/2018 05:37 |
| NAWC-073118-FRB-179     | 320-41679-8        | 2018.08.07_537C 036.d | 08/08/2018 05:41 |
| NAWC-073118-RW-124      | 320-41679-9        | 2018.08.07_537C 037.d | 08/08/2018 05:46 |
| NAWC-073118-FRB-124     | 320-41679-10       | 2018.08.07_537C 038.d | 08/08/2018 05:51 |
| WGNA-073118-RW-3103     | 320-41679-11       | 2018.08.07_537C 039.d | 08/08/2018 05:55 |
| WGNA-073118-FRB-3103    | 320-41679-12       | 2018.08.07_537C 040.d | 08/08/2018 06:00 |

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A8\_N Calibration Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 08/07/2018 13:07  
 Calibration ID: 40513

|                                           |                            | 13PFOA  |      | PFOS    |      |        |      |
|-------------------------------------------|----------------------------|---------|------|---------|------|--------|------|
|                                           |                            | AREA #  | RT # | AREA #  | RT # | AREA # | RT # |
| INITIAL CALIBRATION MEAN AREA AND MEAN RT |                            | 1166146 | 1.77 | 2617368 | 2.02 |        |      |
| UPPER LIMIT                               |                            | 1749219 | 2.27 | 3926052 | 2.52 |        |      |
| LOWER LIMIT                               |                            | 583073  | 1.27 | 1308684 | 1.52 |        |      |
| LAB SAMPLE ID                             | CLIENT SAMPLE ID           |         |      |         |      |        |      |
| CCVL 320-238469/9                         |                            | 1156656 | 1.77 | 2655389 | 2.01 |        |      |
| ICV 320-238469/11                         |                            | 1199776 | 1.78 | 2744266 | 2.01 |        |      |
| CCVL 320-238776/1                         |                            | 1231833 | 1.76 | 2765004 | 2.00 |        |      |
| CCV 320-238610/1<br>CCVIS                 |                            | 1104849 | 1.76 | 2591082 | 1.99 |        |      |
| MB 320-237969/1-A                         |                            | 1310053 | 1.76 | 2893199 | 2.00 |        |      |
| LCS 320-237969/2-A                        |                            | 1249637 | 1.76 | 2724470 | 2.00 |        |      |
| 320-41679-1                               | WGNA-073118-RW-3785        | 1291243 | 1.76 | 2903279 | 2.00 |        |      |
| 320-41679-1 MS                            | WGNA-073118-RW-3785<br>MS  | 1422947 | 1.76 | 3131824 | 2.00 |        |      |
| 320-41679-1 MSD                           | WGNA-073118-RW-3785<br>MSD | 1410294 | 1.76 | 3025296 | 1.99 |        |      |
| 320-41679-2                               | WGNA-073118-FRB-3785       | 1318818 | 1.75 | 2897246 | 1.99 |        |      |
| 320-41679-3                               | NAWC-073118-RW-154         | 1216043 | 1.76 | 2589046 | 2.00 |        |      |
| 320-41679-4                               | NAWC-073118-FRB-154        | 1282240 | 1.75 | 2710739 | 1.99 |        |      |
| 320-41679-5                               | NAWC-073118-RW-185         | 1395103 | 1.75 | 2974332 | 1.98 |        |      |
| 320-41679-6                               | NAWC-073118-FRB-185        | 1180694 | 1.76 | 2717096 | 2.00 |        |      |
| CCV 320-238610/13<br>CCVIS                |                            | 1097335 | 1.76 | 2390195 | 2.00 |        |      |
| CCV 320-238612/13<br>CCVIS                |                            | 1097335 | 1.76 | 2390195 | 2.00 |        |      |
| 320-41679-7                               | NAWC-073118-RW-179         | 1328558 | 1.76 | 2933682 | 1.99 |        |      |
| 320-41679-8                               | NAWC-073118-FRB-179        | 1340148 | 1.76 | 2940104 | 1.99 |        |      |
| 320-41679-9                               | NAWC-073118-RW-124         | 1465526 | 1.76 | 3163107 | 2.00 |        |      |
| 320-41679-10                              | NAWC-073118-FRB-124        | 1319545 | 1.76 | 2963050 | 1.99 |        |      |
| 320-41679-11                              | WGNA-073118-RW-3103        | 1125238 | 1.75 | 2495650 | 1.99 |        |      |
| 320-41679-12                              | WGNA-073118-FRB-3103       | 1179781 | 1.76 | 2532682 | 1.99 |        |      |
| CCV 320-238612/21<br>CCVIS                |                            | 1095270 | 1.75 | 2475586 | 1.99 |        |      |

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 50%-150% of internal standard area

RT Limit =  $\pm$  0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-238610/1 Date Analyzed: 08/08/2018 04:31  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.08.07\_537C\_021 Heated Purge: (Y/N) N  
 Calibration ID: 40513

|                    | 13PFOA                     |         | PFOS    |         |        |      |
|--------------------|----------------------------|---------|---------|---------|--------|------|
|                    | AREA #                     | RT #    | AREA #  | RT #    | AREA # | RT # |
| 12/24 HOUR STD     | 1104849                    | 1.76    | 2591082 | 1.99    |        |      |
| UPPER LIMIT        | 1546789                    | 2.26    | 3627515 | 2.49    |        |      |
| LOWER LIMIT        | 773394                     | 1.26    | 1813757 | 1.49    |        |      |
| LAB SAMPLE ID      | CLIENT SAMPLE ID           |         |         |         |        |      |
| MB 320-237969/1-A  |                            | 1310053 | 1.76    | 2893199 | 2.00   |      |
| LCS 320-237969/2-A |                            | 1249637 | 1.76    | 2724470 | 2.00   |      |
| 320-41679-1        | WGNA-073118-RW-3785        | 1291243 | 1.76    | 2903279 | 2.00   |      |
| 320-41679-1 MS     | WGNA-073118-RW-3785<br>MS  | 1422947 | 1.76    | 3131824 | 2.00   |      |
| 320-41679-1 MSD    | WGNA-073118-RW-3785<br>MSD | 1410294 | 1.76    | 3025296 | 1.99   |      |
| 320-41679-2        | WGNA-073118-FRB-3785       | 1318818 | 1.75    | 2897246 | 1.99   |      |
| 320-41679-3        | NAWC-073118-RW-154         | 1216043 | 1.76    | 2589046 | 2.00   |      |
| 320-41679-4        | NAWC-073118-FRB-154        | 1282240 | 1.75    | 2710739 | 1.99   |      |
| 320-41679-5        | NAWC-073118-RW-185         | 1395103 | 1.75    | 2974332 | 1.98   |      |
| 320-41679-6        | NAWC-073118-FRB-185        | 1180694 | 1.76    | 2717096 | 2.00   |      |

13PFOA = 13C2-PFOA  
 13PFOA = 13C2-PFOA  
 PFOS = 13C4 PFOS  
 PFOS = 13C4 PFOS  
 Area Limit = 70%-140% of internal standard area  
 RT Limit = ± 0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-238610/13 Date Analyzed: 08/08/2018 05:27  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.08.07\_537C\_033 Heated Purge: (Y/N) N  
 Calibration ID: 40513

|                    | 13PFOA                     |         | PFOS    |         |        |      |
|--------------------|----------------------------|---------|---------|---------|--------|------|
|                    | AREA #                     | RT #    | AREA #  | RT #    | AREA # | RT # |
| 12/24 HOUR STD     | 1097335                    | 1.76    | 2390195 | 2.00    |        |      |
| UPPER LIMIT        | 1536269                    | 2.26    | 3346273 | 2.50    |        |      |
| LOWER LIMIT        | 768135                     | 1.26    | 1673137 | 1.50    |        |      |
| LAB SAMPLE ID      | CLIENT SAMPLE ID           |         |         |         |        |      |
| MB 320-237969/1-A  |                            | 1310053 | 1.76    | 2893199 | 2.00   |      |
| LCS 320-237969/2-A |                            | 1249637 | 1.76    | 2724470 | 2.00   |      |
| 320-41679-1        | WGNA-073118-RW-3785        | 1291243 | 1.76    | 2903279 | 2.00   |      |
| 320-41679-1 MS     | WGNA-073118-RW-3785<br>MS  | 1422947 | 1.76    | 3131824 | 2.00   |      |
| 320-41679-1 MSD    | WGNA-073118-RW-3785<br>MSD | 1410294 | 1.76    | 3025296 | 1.99   |      |
| 320-41679-2        | WGNA-073118-FRB-3785       | 1318818 | 1.75    | 2897246 | 1.99   |      |
| 320-41679-3        | NAWC-073118-RW-154         | 1216043 | 1.76    | 2589046 | 2.00   |      |
| 320-41679-4        | NAWC-073118-FRB-154        | 1282240 | 1.75    | 2710739 | 1.99   |      |
| 320-41679-5        | NAWC-073118-RW-185         | 1395103 | 1.75    | 2974332 | 1.98   |      |
| 320-41679-6        | NAWC-073118-FRB-185        | 1180694 | 1.76    | 2717096 | 2.00   |      |

13PFOA = 13C2-PFOA  
 13PFOA = 13C2-PFOA  
 PFOS = 13C4 PFOS  
 PFOS = 13C4 PFOS  
 Area Limit = 70%-140% of internal standard area  
 RT Limit = ± 0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-238612/13 Date Analyzed: 08/08/2018 05:27  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.08.07\_537C\_033 Heated Purge: (Y/N) N  
 Calibration ID: 40513

|                | 13PFOA               |         | PFOS    |         |        |      |
|----------------|----------------------|---------|---------|---------|--------|------|
|                | AREA #               | RT #    | AREA #  | RT #    | AREA # | RT # |
| 12/24 HOUR STD | 1097335              | 1.76    | 2390195 | 2.00    |        |      |
| UPPER LIMIT    | 1536269              | 2.26    | 3346273 | 2.50    |        |      |
| LOWER LIMIT    | 768135               | 1.26    | 1673137 | 1.50    |        |      |
| LAB SAMPLE ID  | CLIENT SAMPLE ID     |         |         |         |        |      |
| 320-41679-7    | NAWC-073118-RW-179   | 1328558 | 1.76    | 2933682 | 1.99   |      |
| 320-41679-8    | NAWC-073118-FRB-179  | 1340148 | 1.76    | 2940104 | 1.99   |      |
| 320-41679-9    | NAWC-073118-RW-124   | 1465526 | 1.76    | 3163107 | 2.00   |      |
| 320-41679-10   | NAWC-073118-FRB-124  | 1319545 | 1.76    | 2963050 | 1.99   |      |
| 320-41679-11   | WGNA-073118-RW-3103  | 1125238 | 1.75    | 2495650 | 1.99   |      |
| 320-41679-12   | WGNA-073118-FRB-3103 | 1179781 | 1.76    | 2532682 | 1.99   |      |

13PFOA = 13C2-PFOA  
 13PFOA = 13C2-PFOA  
 PFOS = 13C4 PFOS  
 PFOS = 13C4 PFOS  
 Area Limit = 70%-140% of internal standard area  
 RT Limit = ± 0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-238612/21 Date Analyzed: 08/08/2018 06:05  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.08.07\_537C\_041 Heated Purge: (Y/N) N  
 Calibration ID: 40513

|                |                      | 13PFOA  |      | PFOS    |      |        |      |
|----------------|----------------------|---------|------|---------|------|--------|------|
|                |                      | AREA #  | RT # | AREA #  | RT # | AREA # | RT # |
| 12/24 HOUR STD |                      | 1095270 | 1.75 | 2475586 | 1.99 |        |      |
| UPPER LIMIT    |                      | 1533378 | 2.25 | 3465820 | 2.49 |        |      |
| LOWER LIMIT    |                      | 766689  | 1.25 | 1732910 | 1.49 |        |      |
| LAB SAMPLE ID  | CLIENT SAMPLE ID     |         |      |         |      |        |      |
| 320-41679-7    | NAWC-073118-RW-179   | 1328558 | 1.76 | 2933682 | 1.99 |        |      |
| 320-41679-8    | NAWC-073118-FRB-179  | 1340148 | 1.76 | 2940104 | 1.99 |        |      |
| 320-41679-9    | NAWC-073118-RW-124   | 1465526 | 1.76 | 3163107 | 2.00 |        |      |
| 320-41679-10   | NAWC-073118-FRB-124  | 1319545 | 1.76 | 2963050 | 1.99 |        |      |
| 320-41679-11   | WGNA-073118-RW-3103  | 1125238 | 1.75 | 2495650 | 1.99 |        |      |
| 320-41679-12   | WGNA-073118-FRB-3103 | 1179781 | 1.76 | 2532682 | 1.99 |        |      |

13PFOA = 13C2-PFOA  
 13PFOA = 13C2-PFOA  
 PFOS = 13C4 PFOS  
 PFOS = 13C4 PFOS  
 Area Limit = 70%-140% of internal standard area  
 RT Limit = ± 0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                             |
|----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-41679-1</u>                 |
| SDG No.: _____                               |                                             |
| Client Sample ID: <u>WGNA-073118-RW-3785</u> | Lab Sample ID: <u>320-41679-1</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2018.08.07_537C_025.d</u>   |
| Analysis Method: <u>537</u>                  | Date Collected: <u>07/31/2018 08:40</u>     |
| Extraction Method: <u>537</u>                | Date Extracted: <u>08/04/2018 08:24</u>     |
| Sample wt/vol: <u>240.3(mL)</u>              | Date Analyzed: <u>08/08/2018 04:50</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>           | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>238610</u>            | Units: <u>ng/L</u>                          |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 11     | J | 42  | 17  | 7.1 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 16     | J | 21  | 8.3 | 2.9 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 21     | U | 25  | 21  | 8.3 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 15     | J | 31  | 12  | 5.7 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 5.9    | J | 10  | 4.2 | 2.0 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 37     | U | 94  | 37  | 17  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 88   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 103  |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_025.d  
 Lims ID: 320-41679-A-1-A  
 Client ID: WGNA-073118-RW-3785  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 04:50:20 ALS Bottle#: 14 Worklist Smp#: 5  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41679-a-1-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj

Date: 08-Aug-2018 13:44:21

| Signal                          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 298.90 > 80.00                  | 1.350 | 1.350     | 0.0       | 1.000     | 239454   | 2.00            |                 | 166   |       |
| 298.90 > 99.00                  | 1.350 | 1.350     | 0.0       | 1.000     | 155215   |                 | 1.54(0.00-0.00) | 218   |       |
| \$ 2 13C2 PFHxA                 |       |           |           |           |          |                 |                 |       |       |
| 315.00 > 270.00                 | 1.464 | 1.464     | 0.0       | 1.000     | 1250801  | 8.81            |                 | 11394 |       |
| 3 Perfluorohexanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 399.00 > 80.00                  | 1.593 | 1.593     | 0.0       | 1.000     | 633447   | 3.51            |                 | 376   |       |
| 4 Perfluoroheptanoic acid       |       |           |           |           |          |                 |                 |       |       |
| 363.00 > 319.00                 | 1.593 | 1.593     | 0.0       | 1.000     | 195383   | 1.41            |                 | 23.7  |       |
| * 6 13C2-PFOA                   |       |           |           |           |          |                 |                 |       |       |
| 415.00 > 370.00                 | 1.760 | 1.760     | 0.0       |           | 1291243  | 10.0            |                 | 8852  |       |
| 5 Perfluorooctanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 413.00 > 369.00                 | 1.760 | 1.760     | 0.0       | 1.000     | 531097   | 3.75            |                 | 57.8  |       |
| 413.00 > 169.00                 | 1.760 | 1.760     | 0.0       | 1.000     | 374075   |                 | 1.42(0.00-0.00) | 527   |       |
| * 7 13C4 PFOS                   |       |           |           |           |          |                 |                 |       |       |
| 503.00 > 80.00                  | 1.995 | 1.988     | 0.007     |           | 2903279  | 28.7            |                 | 2514  |       |
| 9 Perfluorononanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 463.00 > 419.00                 | 1.927 | 1.995     | -0.068    | 1.000     | 144096   | 1.42            |                 | 10.9  |       |
| 8 Perfluorooctane sulfonic acid |       |           |           |           |          |                 |                 |       |       |
| 499.00 > 80.00                  | 1.995 | 2.018     | -0.023    | 1.000     | 290240   | 2.63            |                 | 90.9  |       |
| 499.00 > 99.00                  | 1.995 | 2.018     | -0.023    | 1.000     | 52339    |                 | 5.55(0.00-0.00) | 76.8  |       |
| \$ 10 13C2 PFDA                 |       |           |           |           |          |                 |                 |       |       |
| 515.00 > 470.00                 | 2.208 | 2.208     | 0.0       | 1.000     | 1089844  | 10.3            |                 | 9993  |       |



## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_025.d

Injection Date: 08-Aug-2018 04:50:20

Instrument ID: A8\_N

Lims ID: 320-41679-A-1-A

Lab Sample ID: 320-41679-1

Client ID: WGNA-073118-RW-3785

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 14

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

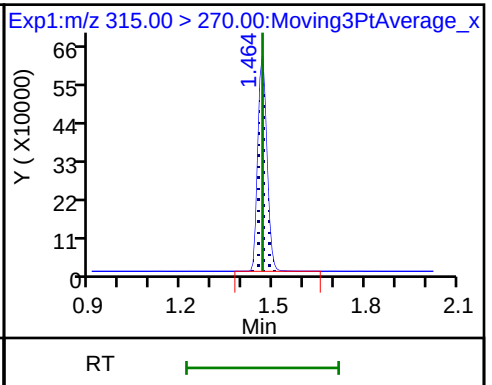
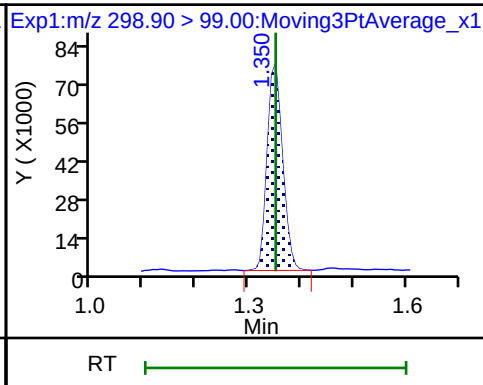
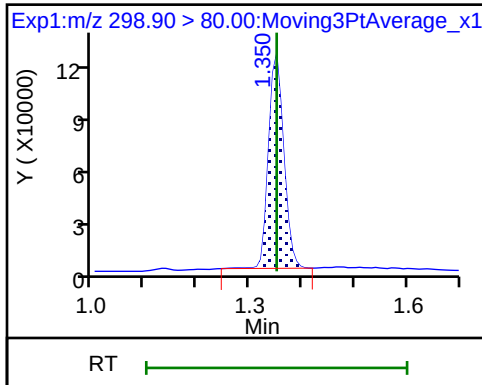
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

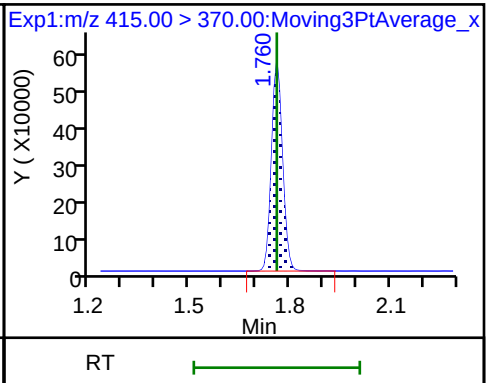
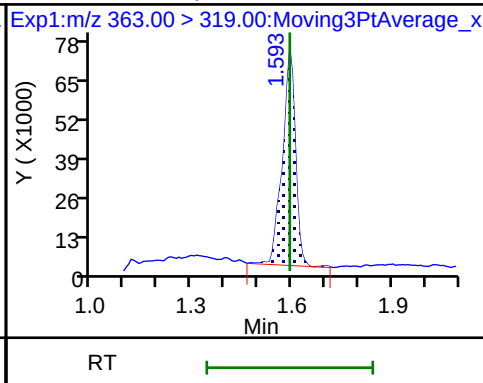
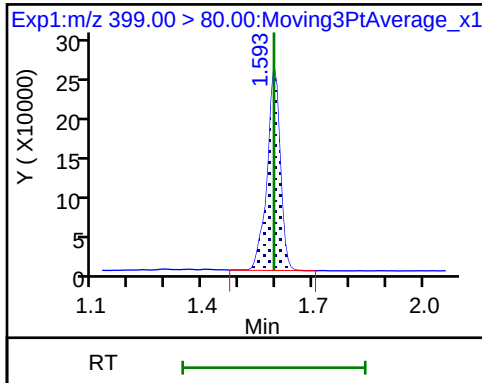
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

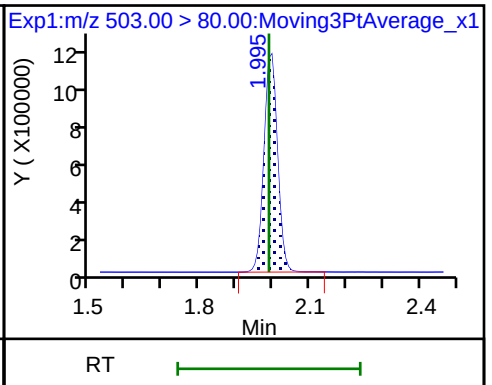
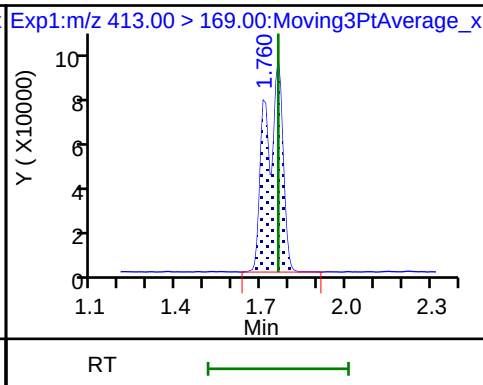
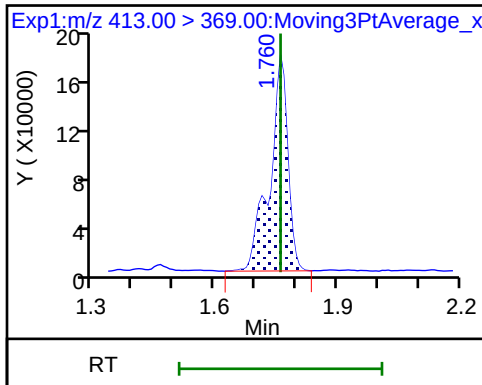
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

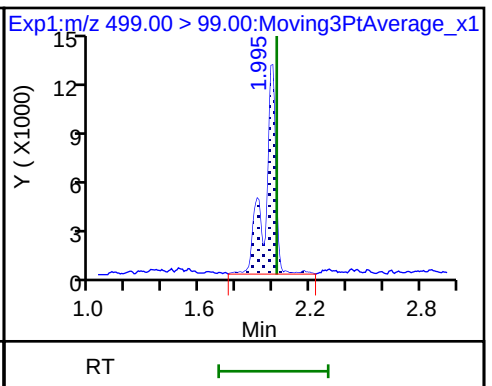
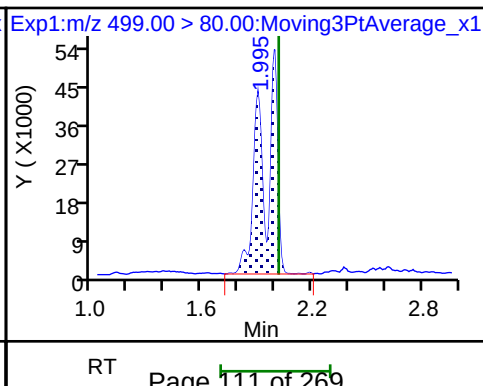
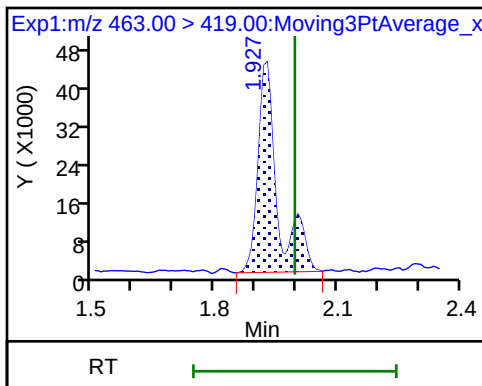
## \* 7 13C4 PFOS



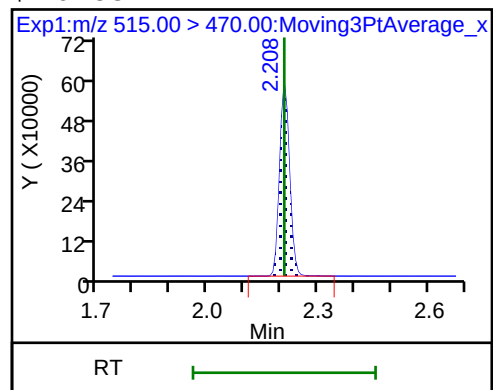
## 9 Perfluorononanoic acid

## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_025.d  
Lims ID: 320-41679-A-1-A  
Client ID: WGNA-073118-RW-3785  
Sample Type: Client  
Inject. Date: 08-Aug-2018 04:50:20 ALS Bottle#: 14 Worklist Smp#: 5  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-41679-a-1-a  
Misc. Info.: Plate: 1 Rack: 2  
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
Column 1 : Det: EXP1  
Process Host: XAWRK002

First Level Reviewer: barnettj

Date: 08-Aug-2018 13:44:21

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.81             | 88.09  |
| \$ 10 13C2 PFDA | 10.0         | 10.3             | 103.07 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                               |                                             |
|-----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>       | Job No.: <u>320-41679-1</u>                 |
| SDG No.: _____                                |                                             |
| Client Sample ID: <u>WGNA-073118-FRB-3785</u> | Lab Sample ID: <u>320-41679-2</u>           |
| Matrix: <u>Water</u>                          | Lab File ID: <u>2018.08.07_537C_028.d</u>   |
| Analysis Method: <u>537</u>                   | Date Collected: <u>07/31/2018 08:35</u>     |
| Extraction Method: <u>537</u>                 | Date Extracted: <u>08/04/2018 08:24</u>     |
| Sample wt/vol: <u>261.7(mL)</u>               | Date Analyzed: <u>08/08/2018 05:04</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>            | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>                | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                             | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>238610</u>             | Units: <u>ng/L</u>                          |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 15     | U | 38  | 15  | 6.5 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.6    | U | 19  | 7.6 | 2.7 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U | 23  | 19  | 7.6 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 11     | U | 29  | 11  | 5.3 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 3.8    | U | 9.6 | 3.8 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 34     | U | 86  | 34  | 15  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 86   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 97   |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_028.d  
 Lims ID: 320-41679-A-2-A  
 Client ID: WGNA-073118-FRB-3785  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 05:04:22 ALS Bottle#: 17 Worklist Smp#: 8  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41679-a-2-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Signal          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits) | S/N   | Flags |
|-----------------|-------|-----------|-----------|-----------|----------|-----------------|---------------|-------|-------|
| \$ 2 13C2 PFHxA |       |           |           |           |          |                 |               |       |       |
| 315.00 > 270.00 | 1.457 | 1.464     | -0.007    | 1.000     | 1252161  | 8.63            |               | 10586 |       |
| * 6 13C2-PFOA   |       |           |           |           |          |                 |               |       |       |
| 415.00 > 370.00 | 1.753 | 1.760     | -0.007    |           | 1318818  | 10.0            |               | 7558  |       |
| * 7 13C4 PFOS   |       |           |           |           |          |                 |               |       |       |
| 503.00 > 80.00  | 1.988 | 1.988     | 0.0       |           | 2897246  | 28.7            |               | 3716  |       |
| \$ 10 13C2 PFDA |       |           |           |           |          |                 |               |       |       |
| 515.00 > 470.00 | 2.200 | 2.208     | -0.008    | 1.000     | 1045967  | 9.69            |               | 7885  |       |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_028.d

Injection Date: 08-Aug-2018 05:04:22

Instrument ID: A8\_N

Lims ID: 320-41679-A-2-A

Lab Sample ID: 320-41679-2

Client ID: WGNA-073118-FRB-3785

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 17

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

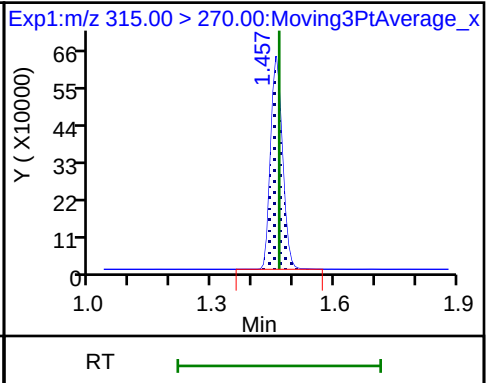
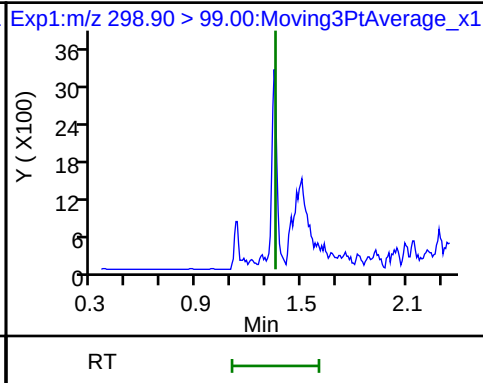
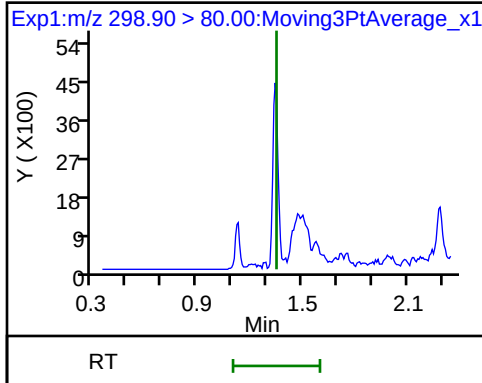
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

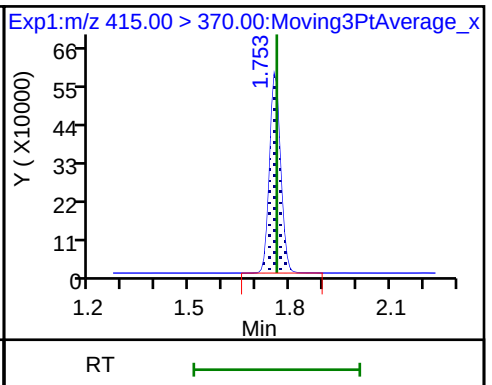
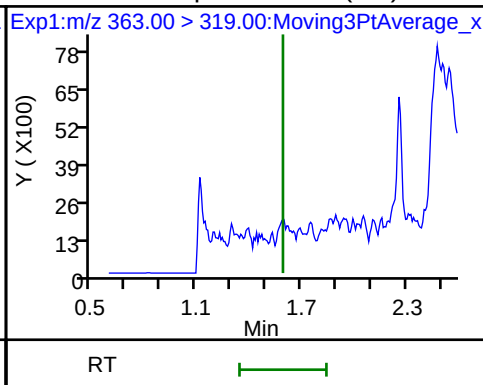
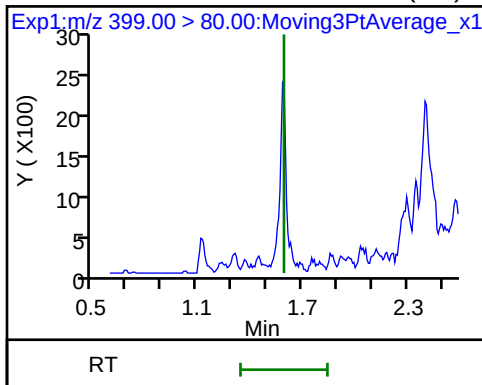
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

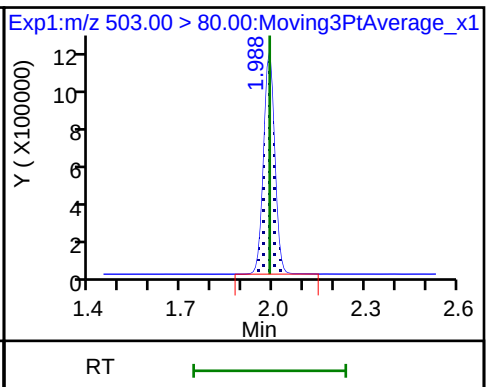
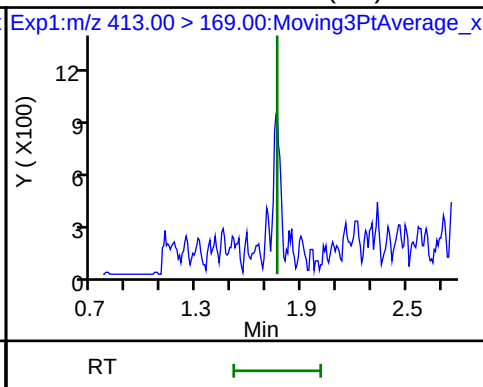
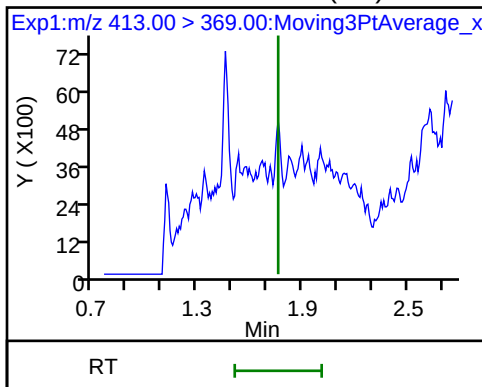
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

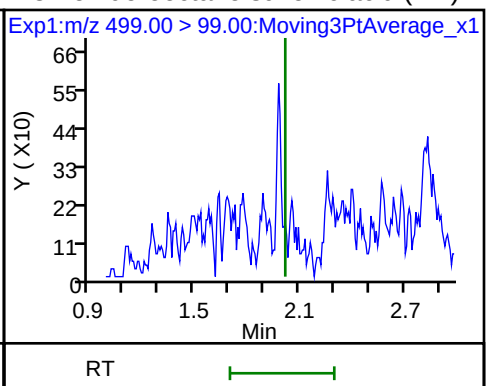
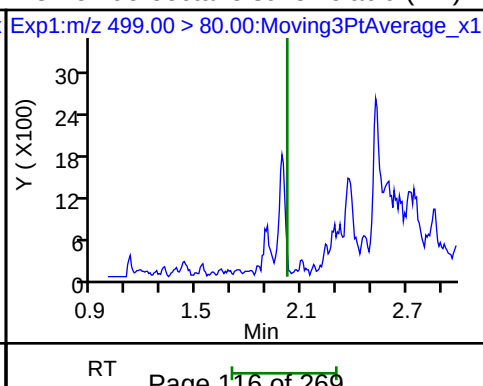
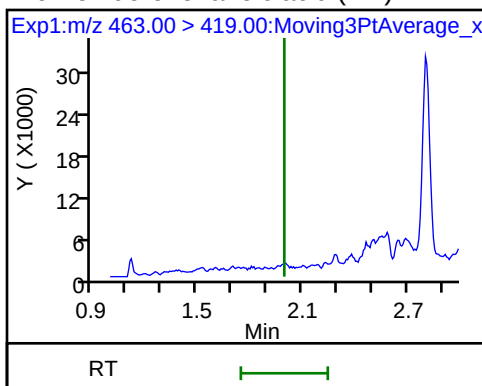
\* 7 13C4 PFOS



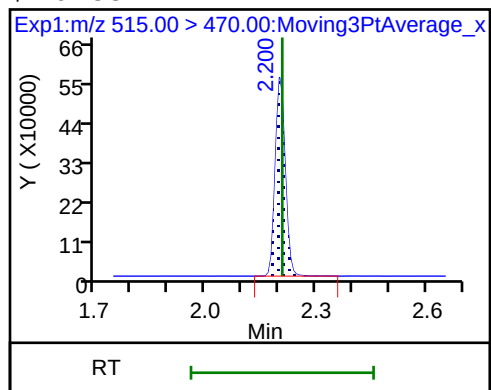
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_028.d  
Lims ID: 320-41679-A-2-A  
Client ID: WGNA-073118-FRB-3785  
Sample Type: Client  
Inject. Date: 08-Aug-2018 05:04:22 ALS Bottle#: 17 Worklist Smp#: 8  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-41679-a-2-a  
Misc. Info.: Plate: 1 Rack: 2  
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.63             | 86.34  |
| \$ 10 13C2 PFDA | 10.0         | 9.69             | 96.86  |



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                             |                                                     |
|---------------------------------------------|-----------------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>     | Job No.: <u>320-41679-1</u>                         |
| SDG No.: _____                              |                                                     |
| Client Sample ID: <u>NAWC-073118-RW-154</u> | Lab Sample ID: <u>320-41679-3</u>                   |
| Matrix: <u>Water</u>                        | Lab File ID: <u>2018.08.07_537C_029.d</u>           |
| Analysis Method: <u>537</u>                 | Date Collected: <u>07/31/2018 10:10</u>             |
| Extraction Method: <u>537</u>               | Date Extracted: <u>08/04/2018 08:24</u>             |
| Sample wt/vol: <u>254.3 (mL)</u>            | Date Analyzed: <u>08/08/2018 05:09</u>              |
| Con. Extract Vol.: <u>1.00 (mL)</u>         | Dilution Factor: <u>1</u>                           |
| Injection Volume: <u>2 (uL)</u>             | GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u> |
| % Moisture: _____                           | GPC Cleanup: (Y/N) <u>N</u>                         |
| Analysis Batch No.: <u>238610</u>           | Units: <u>ng/L</u>                                  |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 17     | J | 39  | 16  | 6.7 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 24     |   | 20  | 7.9 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 7.9 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 29  | 12  | 5.4 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 8.9    | J | 9.8 | 3.9 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 88  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 80   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 94   |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_029.d  
 Lims ID: 320-41679-A-3-A  
 Client ID: NAWC-073118-RW-154  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 05:09:01 ALS Bottle#: 18 Worklist Smp#: 9  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41679-a-3-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj

Date: 08-Aug-2018 13:45:22

| Signal                          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | S/N  | Flags |
|---------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid  |       |           |           |           |          |                 |                 |      |       |
| 298.90 > 80.00                  | 1.350 | 1.350     | 0.0       | 1.000     | 226817   | 2.12            |                 | 172  |       |
| 298.90 > 99.00                  | 1.350 | 1.350     | 0.0       | 1.000     | 156047   |                 | 1.45(0.00-0.00) | 213  |       |
| \$ 2 13C2 PFHxA                 |       |           |           |           |          |                 |                 |      |       |
| 315.00 > 270.00                 | 1.464 | 1.464     | 0.0       | 1.000     | 1074437  | 8.04            |                 | 9253 |       |
| 3 Perfluorohexanesulfonic acid  |       |           |           |           |          |                 |                 |      |       |
| 399.00 > 80.00                  | 1.593 | 1.593     | 0.0       | 1.000     | 180903   | 1.12            |                 | 110  |       |
| 4 Perfluoroheptanoic acid       |       |           |           |           |          |                 |                 |      |       |
| 363.00 > 319.00                 | 1.593 | 1.593     | 0.0       | 1.000     | 296033   | 2.26            |                 | 50.4 |       |
| * 6 13C2-PFOA                   |       |           |           |           |          |                 |                 |      |       |
| 415.00 > 370.00                 | 1.760 | 1.760     | 0.0       |           | 1216043  | 10.0            |                 | 8174 |       |
| 5 Perfluorooctanoic acid        |       |           |           |           |          |                 |                 |      |       |
| 413.00 > 369.00                 | 1.760 | 1.760     | 0.0       | 1.000     | 824506   | 6.19            |                 | 108  |       |
| 413.00 > 169.00                 | 1.760 | 1.760     | 0.0       | 1.000     | 462284   |                 | 1.78(0.00-0.00) | 929  |       |
| * 7 13C4 PFOS                   |       |           |           |           |          |                 |                 |      |       |
| 503.00 > 80.00                  | 1.995 | 1.988     | 0.007     |           | 2589046  | 28.7            |                 | 2472 |       |
| 9 Perfluorononanoic acid        |       |           |           |           |          |                 |                 |      |       |
| 463.00 > 419.00                 | 2.003 | 1.995     | 0.008     | 1.000     | 49986    | 0.5215          |                 | 5.0  |       |
| 8 Perfluorooctane sulfonic acid |       |           |           |           |          |                 |                 |      |       |
| 499.00 > 80.00                  | 1.995 | 2.018     | -0.023    | 1.000     | 429708   | 4.36            |                 | 150  |       |
| 499.00 > 99.00                  | 1.995 | 2.018     | -0.023    | 1.000     | 72179    |                 | 5.95(0.00-0.00) | 111  |       |
| \$ 10 13C2 PFDA                 |       |           |           |           |          |                 |                 |      |       |
| 515.00 > 470.00                 | 2.208 | 2.208     | 0.0       | 1.000     | 933023   | 9.37            |                 | 8079 |       |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_029.d

Injection Date: 08-Aug-2018 05:09:01

Instrument ID: A8\_N

Lims ID: 320-41679-A-3-A

Lab Sample ID: 320-41679-3

Client ID: NAWC-073118-RW-154

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 18

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

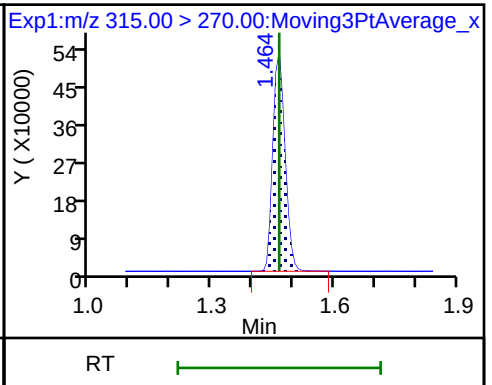
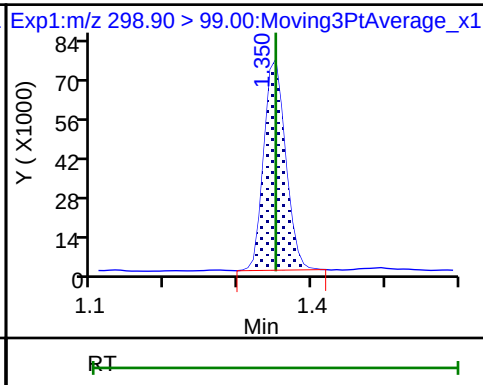
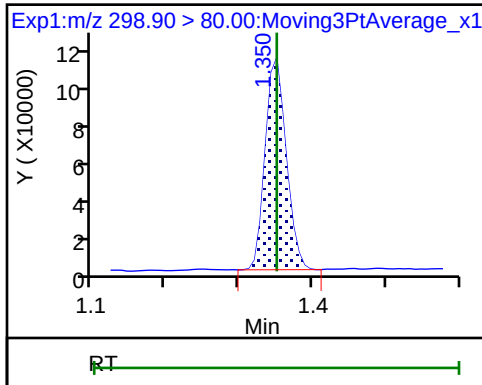
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

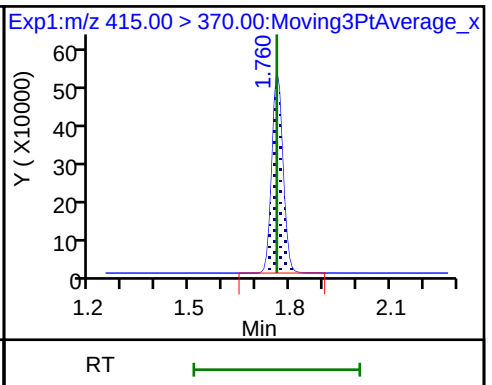
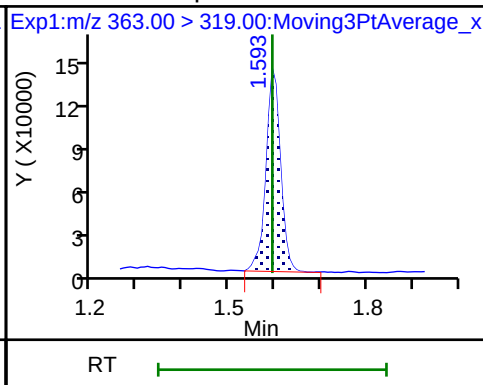
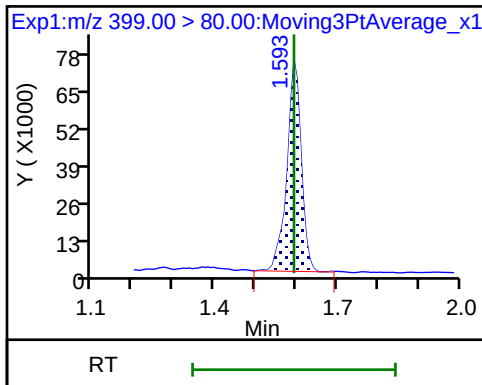
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

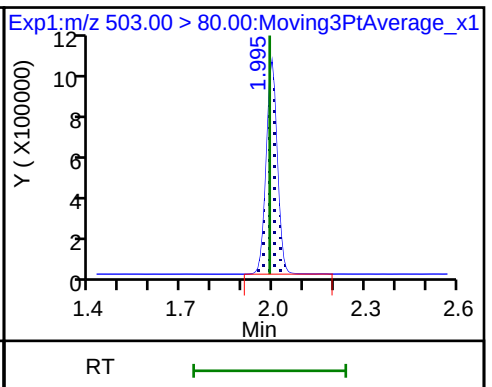
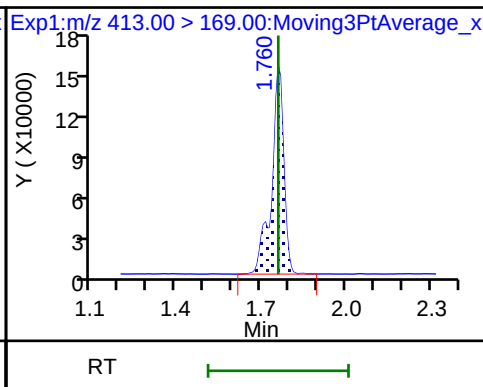
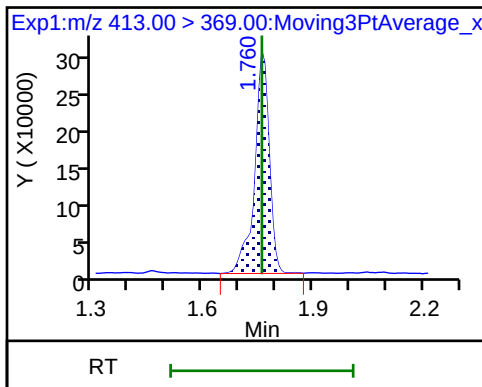
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

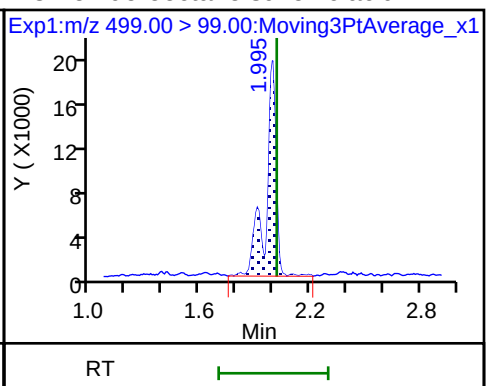
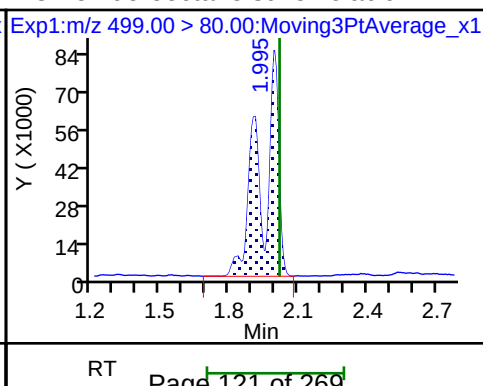
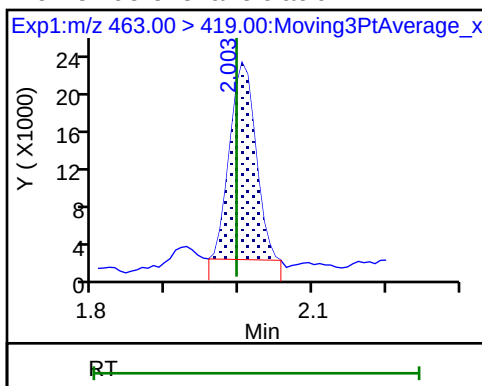
## \* 7 13C4 PFOS



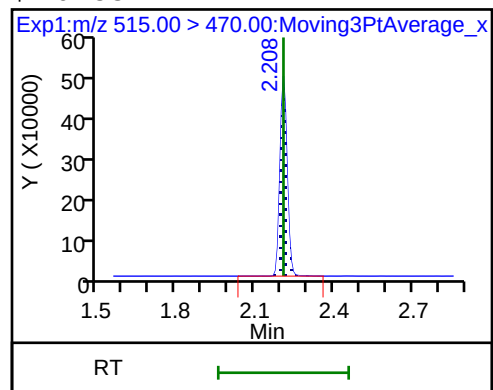
## 9 Perfluorononanoic acid

## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_029.d  
Lims ID: 320-41679-A-3-A  
Client ID: NAWC-073118-RW-154  
Sample Type: Client  
Inject. Date: 08-Aug-2018 05:09:01 ALS Bottle#: 18 Worklist Smp#: 9  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-41679-a-3-a  
Misc. Info.: Plate: 1 Rack: 2  
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
Column 1 : Det: EXP1  
Process Host: XAWRK002

First Level Reviewer: barnettj

Date: 08-Aug-2018 13:45:22

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.04             | 80.35  |
| \$ 10 13C2 PFDA | 10.0         | 9.37             | 93.70  |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                             |
|----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-41679-1</u>                 |
| SDG No.: _____                               |                                             |
| Client Sample ID: <u>NAWC-073118-FRB-154</u> | Lab Sample ID: <u>320-41679-4</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2018.08.07_537C_030.d</u>   |
| Analysis Method: <u>537</u>                  | Date Collected: <u>07/31/2018 10:05</u>     |
| Extraction Method: <u>537</u>                | Date Extracted: <u>08/04/2018 08:24</u>     |
| Sample wt/vol: <u>257.7(mL)</u>              | Date Analyzed: <u>08/08/2018 05:13</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>           | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>238610</u>            | Units: <u>ng/L</u>                          |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 39  | 16  | 6.6 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.8    | U | 19  | 7.8 | 2.7 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U | 23  | 19  | 7.8 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 29  | 12  | 5.3 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 3.9    | U | 9.7 | 3.9 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 87  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 86   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 98   |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_030.d  
 Lims ID: 320-41679-A-4-A  
 Client ID: NAWC-073118-FRB-154  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 05:13:40 ALS Bottle#: 19 Worklist Smp#: 10  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41679-a-4-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Signal          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits) | S/N   | Flags |
|-----------------|-------|-----------|-----------|-----------|----------|-----------------|---------------|-------|-------|
| \$ 2 13C2 PFHxA |       |           |           |           |          |                 |               |       |       |
| 315.00 > 270.00 | 1.457 | 1.464     | -0.007    | 1.000     | 1217211  | 8.63            |               | 11452 |       |
| * 6 13C2-PFOA   |       |           |           |           |          |                 |               |       |       |
| 415.00 > 370.00 | 1.753 | 1.760     | -0.007    |           | 1282240  | 10.0            |               | 7924  |       |
| * 7 13C4 PFOS   |       |           |           |           |          |                 |               |       |       |
| 503.00 > 80.00  | 1.988 | 1.988     | 0.0       |           | 2710739  | 28.7            |               | 3068  |       |
| \$ 10 13C2 PFDA |       |           |           |           |          |                 |               |       |       |
| 515.00 > 470.00 | 2.200 | 2.208     | -0.008    | 1.000     | 1023803  | 9.75            |               | 7245  |       |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_030.d

Injection Date: 08-Aug-2018 05:13:40

Instrument ID: A8\_N

Lims ID: 320-41679-A-4-A

Lab Sample ID: 320-41679-4

Client ID: NAWC-073118-FRB-154

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 19

Worklist Smp#: 10

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

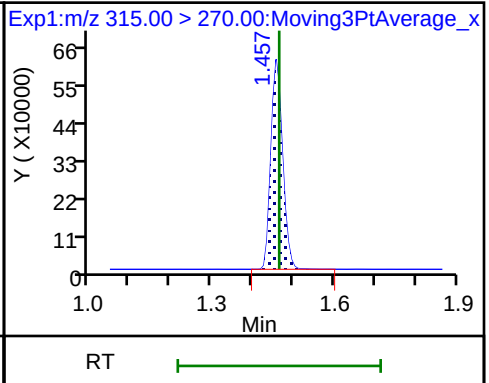
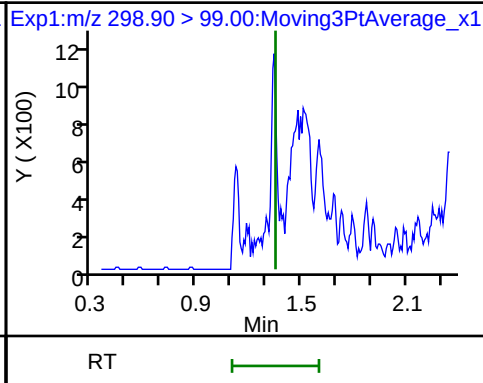
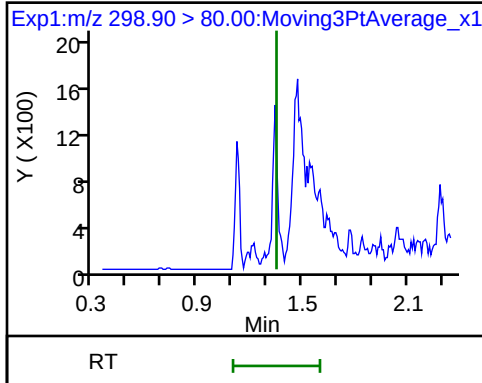
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

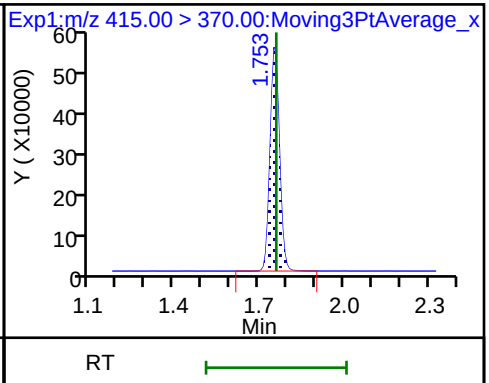
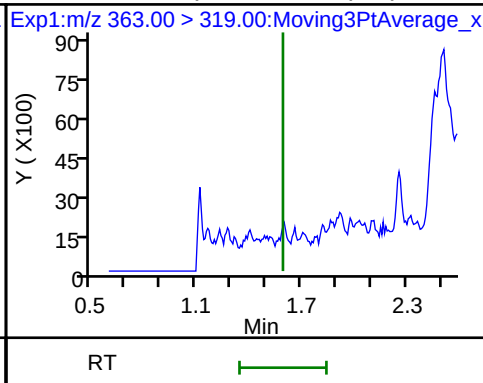
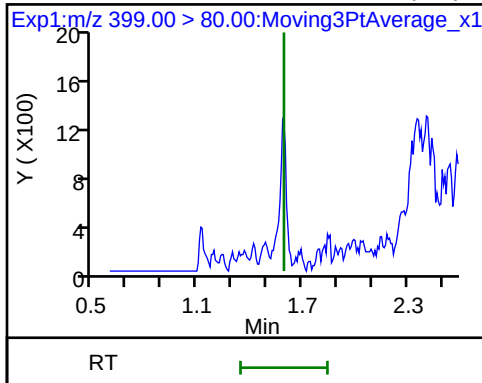
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

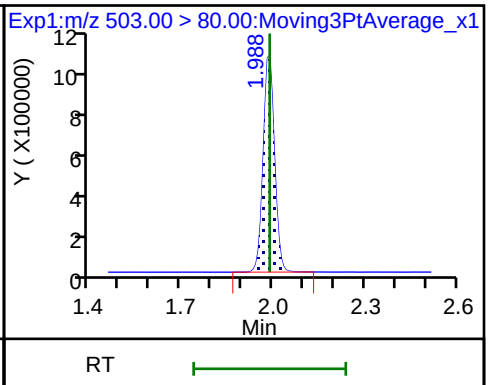
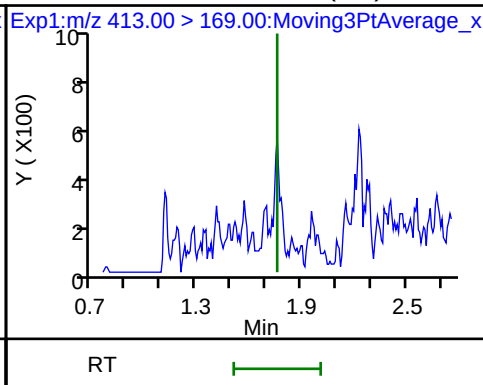
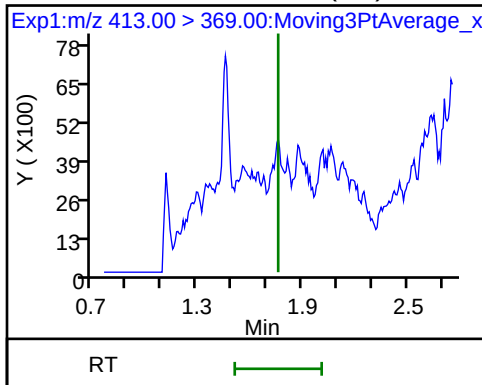
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

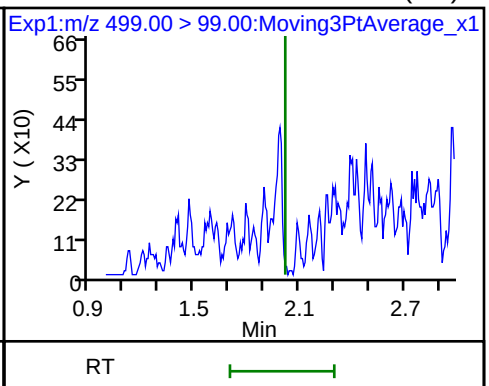
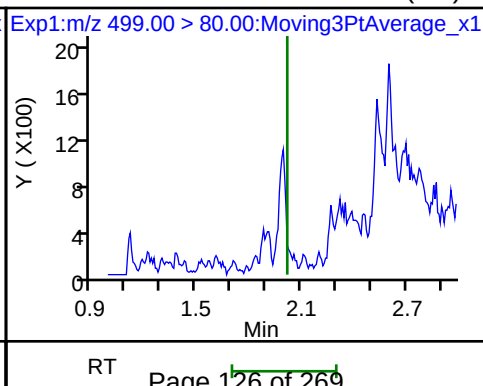
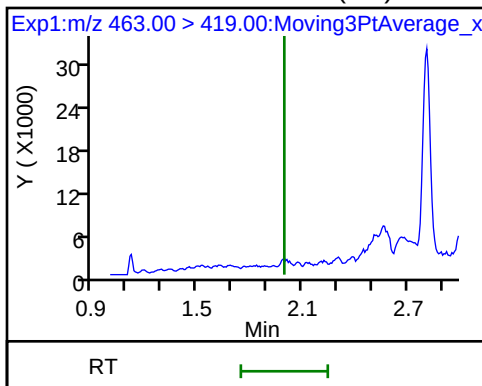
\* 7 13C4 PFOS



9 Perfluorononanoic acid (ND)

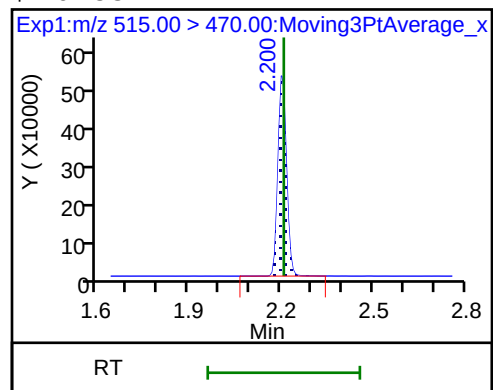
8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)





\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_030.d  
Lims ID: 320-41679-A-4-A  
Client ID: NAWC-073118-FRB-154  
Sample Type: Client  
Inject. Date: 08-Aug-2018 05:13:40 ALS Bottle#: 19 Worklist Smp#: 10  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-41679-a-4-a  
Misc. Info.: Plate: 1 Rack: 2  
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 :

Det: EXP1

Process Host: XAWRK002

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.63             | 86.33  |
| \$ 10 13C2 PFDA | 10.0         | 9.75             | 97.51  |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                             |                                             |
|---------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>     | Job No.: <u>320-41679-1</u>                 |
| SDG No.: _____                              |                                             |
| Client Sample ID: <u>NAWC-073118-RW-185</u> | Lab Sample ID: <u>320-41679-5</u>           |
| Matrix: <u>Water</u>                        | Lab File ID: <u>2018.08.07_537C_031.d</u>   |
| Analysis Method: <u>537</u>                 | Date Collected: <u>07/31/2018 11:10</u>     |
| Extraction Method: <u>537</u>               | Date Extracted: <u>08/04/2018 08:24</u>     |
| Sample wt/vol: <u>265.9(mL)</u>             | Date Analyzed: <u>08/08/2018 05:18</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>          | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>              | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                           | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>238610</u>           | Units: <u>ng/L</u>                          |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 15     | J | 38  | 15  | 6.4 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 12     | J | 19  | 7.5 | 2.6 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U | 23  | 19  | 7.5 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 8.5    | J | 28  | 11  | 5.2 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 8.2    | J | 9.4 | 3.8 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 34     | U | 85  | 34  | 15  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 81   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 94   |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_031.d  
 Lims ID: 320-41679-A-5-A  
 Client ID: NAWC-073118-RW-185  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 05:18:21 ALS Bottle#: 20 Worklist Smp#: 11  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41679-a-5-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj

Date: 08-Aug-2018 13:45:48

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.343 | 1.350  | -0.007 | 1.000  | 146774   | 1.20         |                 | 109   |       |
| 298.90 > 99.00                  | 1.343 | 1.350  | -0.007 | 1.000  | 104118   |              | 1.41(0.00-0.00) | 155   |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.457 | 1.464  | -0.007 | 1.000  | 1247114  | 8.13         |                 | 11983 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.586 | 1.593  | -0.007 | 1.000  | 417701   | 2.26         |                 | 221   |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.586 | 1.593  | -0.007 | 1.000  | 329024   | 2.19         |                 | 52.0  |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.753 | 1.760  | -0.007 |        | 1395103  | 10.0         |                 | 9004  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.753 | 1.760  | -0.007 | 1.000  | 485892   | 3.18         |                 | 63.7  |       |
| 413.00 > 169.00                 | 1.753 | 1.760  | -0.007 | 1.000  | 273122   |              | 1.78(0.00-0.00) | 578   |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 1.980 | 1.988  | -0.008 |        | 2974332  | 28.7         |                 | 2460  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 1.995 | 1.995  | 0.0    | 1.000  | 62830    | 0.5714       |                 | 6.0   |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 1.980 | 2.018  | -0.038 | 1.000  | 452721   | 4.00         |                 | 154   |       |
| 499.00 > 99.00                  | 1.980 | 2.018  | -0.038 | 1.000  | 89543    |              | 5.06(0.00-0.00) | 140   |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.200 | 2.208  | -0.008 | 1.000  | 1073651  | 9.40         |                 | 8434  |       |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_031.d

Injection Date: 08-Aug-2018 05:18:21

Instrument ID: A8\_N

Lims ID: 320-41679-A-5-A

Lab Sample ID: 320-41679-5

Client ID: NAWC-073118-RW-185

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 20

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

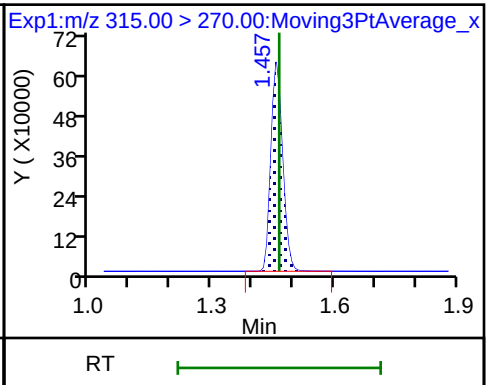
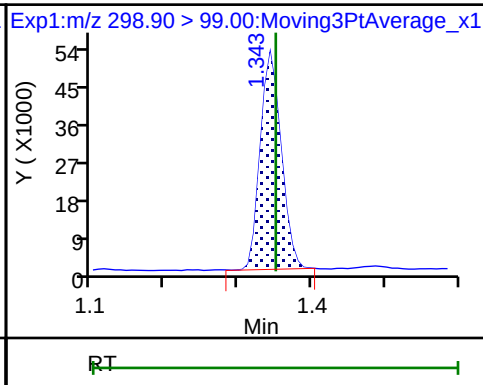
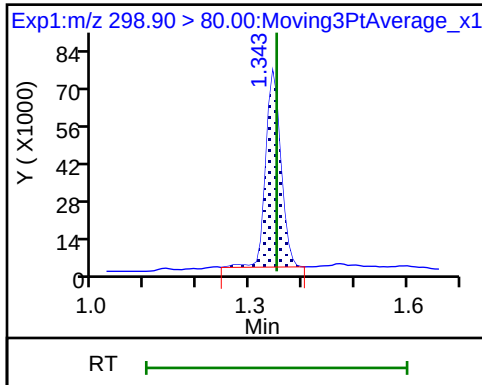
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

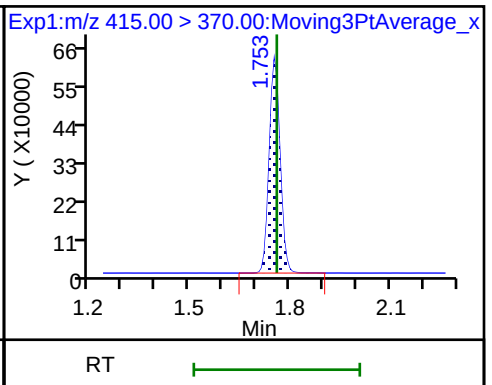
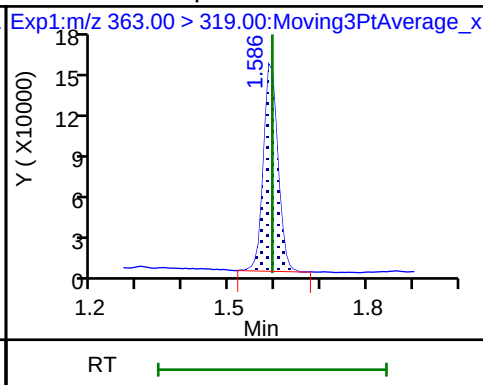
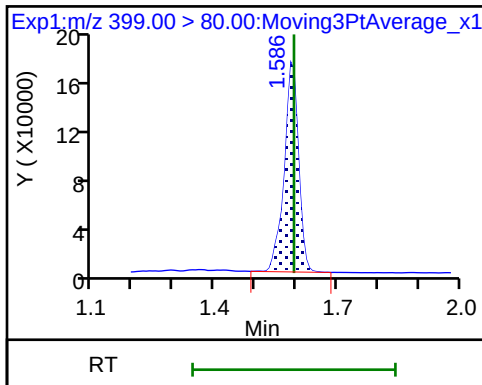
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

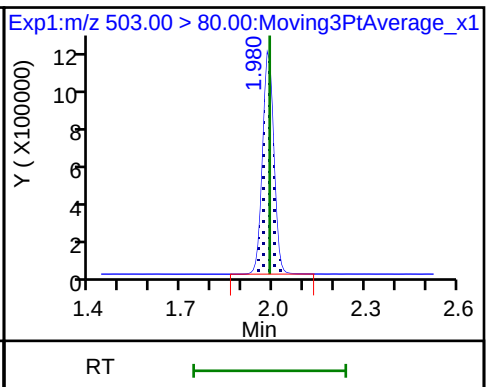
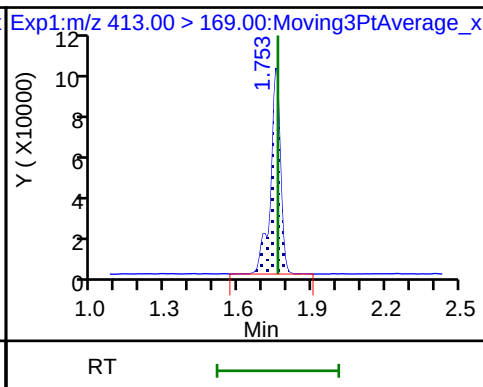
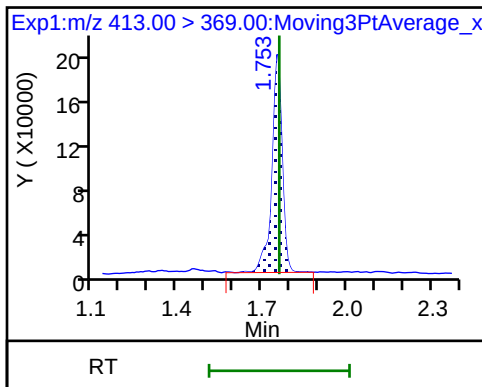
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

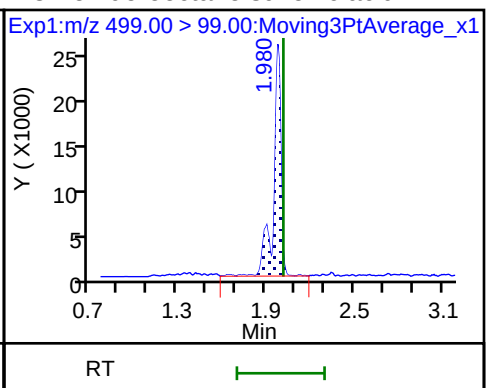
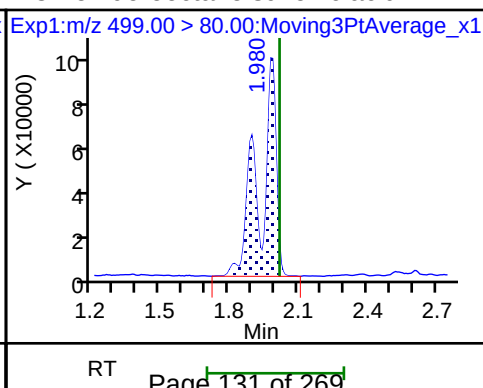
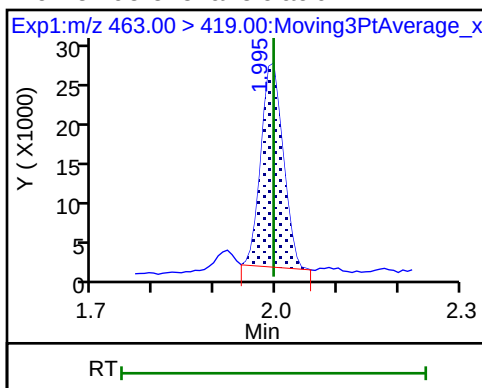
## \* 7 13C4 PFOS



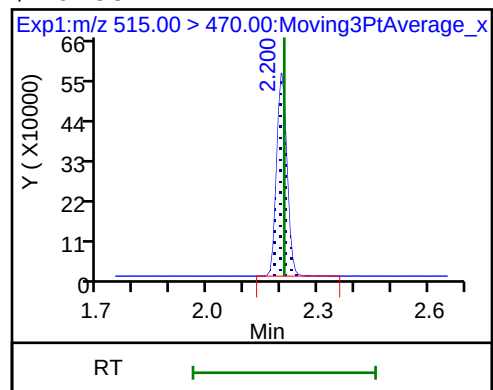
## 9 Perfluorononanoic acid

## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_031.d  
Lims ID: 320-41679-A-5-A  
Client ID: NAWC-073118-RW-185  
Sample Type: Client  
Inject. Date: 08-Aug-2018 05:18:21 ALS Bottle#: 20 Worklist Smp#: 11  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-41679-a-5-a  
Misc. Info.: Plate: 1 Rack: 2  
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
Column 1 : Det: EXP1  
Process Host: XAWRK002

First Level Reviewer: barnettj

Date: 08-Aug-2018 13:45:48

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.13             | 81.29  |
| \$ 10 13C2 PFDA | 10.0         | 9.40             | 93.98  |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                             |
|----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-41679-1</u>                 |
| SDG No.: _____                               |                                             |
| Client Sample ID: <u>NAWC-073118-FRB-185</u> | Lab Sample ID: <u>320-41679-6</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2018.08.07_537C_032.d</u>   |
| Analysis Method: <u>537</u>                  | Date Collected: <u>07/31/2018 11:05</u>     |
| Extraction Method: <u>537</u>                | Date Extracted: <u>08/04/2018 08:24</u>     |
| Sample wt/vol: <u>244.6(mL)</u>              | Date Analyzed: <u>08/08/2018 05:23</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>           | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>238610</u>            | Units: <u>ng/L</u>                          |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 41  | 16  | 7.0 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 8.2    | U | 20  | 8.2 | 2.9 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 25  | 20  | 8.2 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 31  | 12  | 5.6 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 4.1    | U | 10  | 4.1 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 37     | U | 92  | 37  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 98   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 103  |   | 70-130 |



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_032.d  
 Lims ID: 320-41679-A-6-A  
 Client ID: NAWC-073118-FRB-185  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 05:23:01 ALS Bottle#: 21 Worklist Smp#: 12  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41679-a-6-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Signal          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits) | S/N   | Flags |
|-----------------|-------|-----------|-----------|-----------|----------|-----------------|---------------|-------|-------|
| \$ 2 13C2 PFHxA |       |           |           |           |          |                 |               |       |       |
| 315.00 > 270.00 | 1.464 | 1.464     | 0.0       | 1.000     | 1266427  | 9.75            |               | 13555 |       |
| * 6 13C2-PFOA   |       |           |           |           |          |                 |               |       |       |
| 415.00 > 370.00 | 1.760 | 1.760     | 0.0       |           | 1180694  | 10.0            |               | 7044  |       |
| * 7 13C4 PFOS   |       |           |           |           |          |                 |               |       |       |
| 503.00 > 80.00  | 1.995 | 1.988     | 0.007     |           | 2717096  | 28.7            |               | 3454  |       |
| \$ 10 13C2 PFDA |       |           |           |           |          |                 |               |       |       |
| 515.00 > 470.00 | 2.208 | 2.208     | 0.0       | 1.000     | 997503   | 10.3            |               | 8018  |       |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_032.d

Injection Date: 08-Aug-2018 05:23:01

Instrument ID: A8\_N

Lims ID: 320-41679-A-6-A

Lab Sample ID: 320-41679-6

Client ID: NAWC-073118-FRB-185

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 21

Worklist Smp#: 12

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

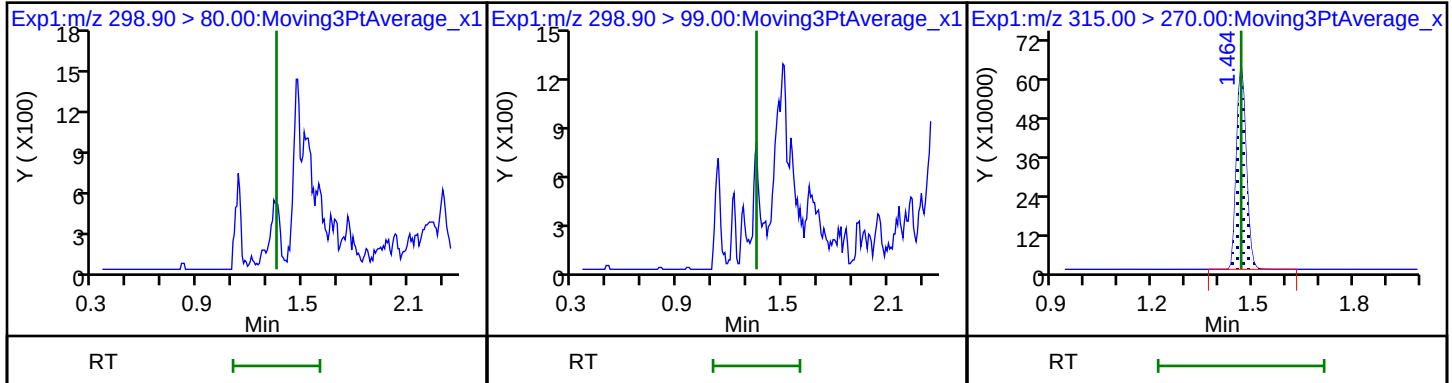
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

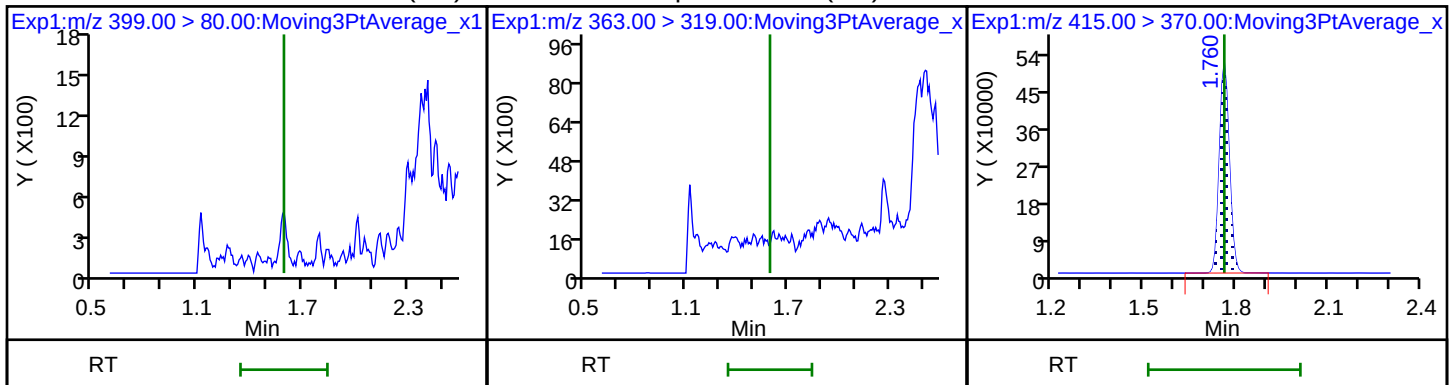
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

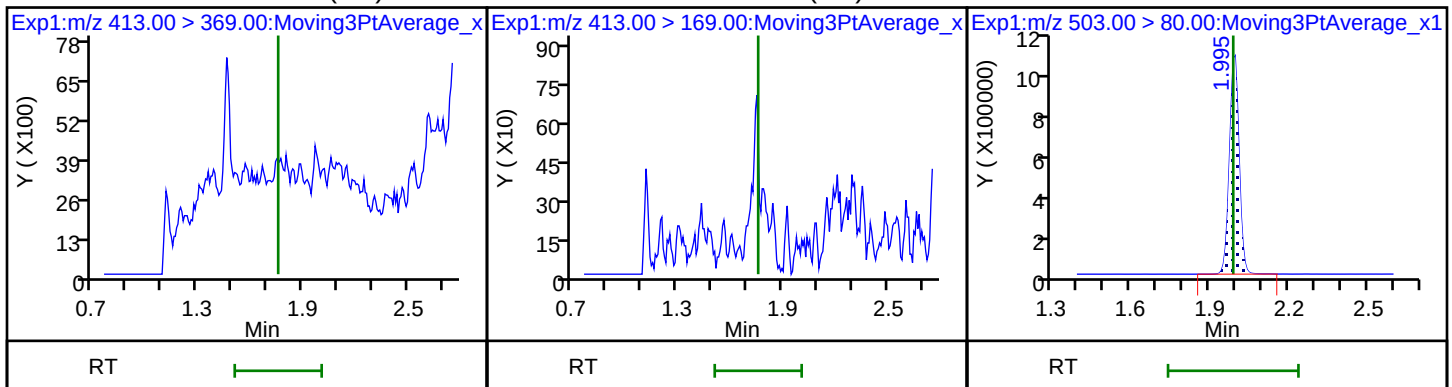
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

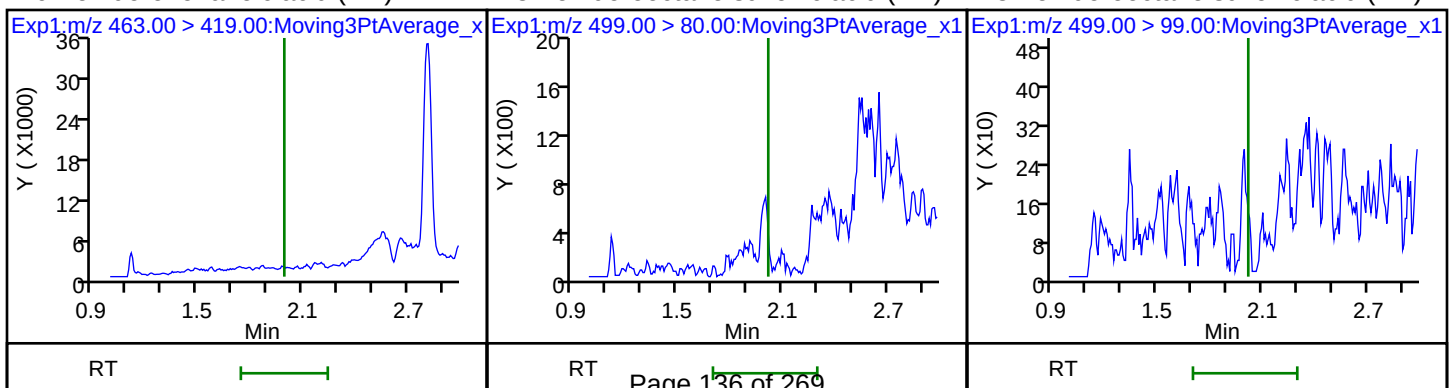
\* 7 13C4 PFOS



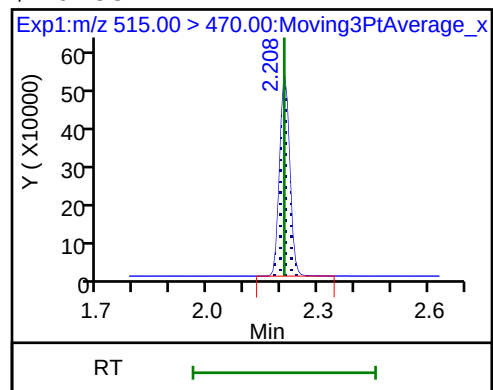
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_032.d  
Lims ID: 320-41679-A-6-A  
Client ID: NAWC-073118-FRB-185  
Sample Type: Client  
Inject. Date: 08-Aug-2018 05:23:01 ALS Bottle#: 21 Worklist Smp#: 12  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-41679-a-6-a  
Misc. Info.: Plate: 1 Rack: 2  
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 9.75             | 97.54  |
| \$ 10 13C2 PFDA | 10.0         | 10.3             | 103.17 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                             |                                                    |
|---------------------------------------------|----------------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>     | Job No.: <u>320-41679-1</u>                        |
| SDG No.: _____                              |                                                    |
| Client Sample ID: <u>NAWC-073118-RW-179</u> | Lab Sample ID: <u>320-41679-7</u>                  |
| Matrix: <u>Water</u>                        | Lab File ID: <u>2018.08.07_537C_035.d</u>          |
| Analysis Method: <u>537</u>                 | Date Collected: <u>07/31/2018 12:10</u>            |
| Extraction Method: <u>537</u>               | Date Extracted: <u>08/04/2018 08:24</u>            |
| Sample wt/vol: <u>257.9(mL)</u>             | Date Analyzed: <u>08/08/2018 05:37</u>             |
| Con. Extract Vol.: <u>1.00(mL)</u>          | Dilution Factor: <u>1</u>                          |
| Injection Volume: <u>2(uL)</u>              | GC Column: <u>GeminiC18 3x100</u> ID: <u>3(mm)</u> |
| % Moisture: _____                           | GPC Cleanup: (Y/N) <u>N</u>                        |
| Analysis Batch No.: <u>238612</u>           | Units: <u>ng/L</u>                                 |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 17     | J | 39  | 16  | 6.6 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 21     |   | 19  | 7.8 | 2.7 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U | 23  | 19  | 7.8 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 7.1    | J | 29  | 12  | 5.3 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 6.0    | J | 9.7 | 3.9 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 87  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 87   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 101  |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_035.d  
 Lims ID: 320-41679-A-7-A  
 Client ID: NAWC-073118-RW-179  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 05:37:01 ALS Bottle#: 22 Worklist Smp#: 15  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41679-a-7-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj

Date: 08-Aug-2018 13:46:22

| Signal                          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 298.90 > 80.00                  | 1.350 | 1.350     | 0.0       | 1.000     | 167897   | 1.39            |                 | 138   |       |
| 298.90 > 99.00                  | 1.350 | 1.350     | 0.0       | 1.000     | 111531   |                 | 1.51(0.00-0.00) | 163   |       |
| \$ 2 13C2 PFHxA                 |       |           |           |           |          |                 |                 |       |       |
| 315.00 > 270.00                 | 1.464 | 1.464     | 0.0       | 1.000     | 1272539  | 8.71            |                 | 11485 |       |
| 3 Perfluorohexanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 399.00 > 80.00                  | 1.593 | 1.593     | 0.0       | 1.000     | 332335   | 1.82            |                 | 212   |       |
| 4 Perfluoroheptanoic acid       |       |           |           |           |          |                 |                 |       |       |
| 363.00 > 319.00                 | 1.593 | 1.593     | 0.0       | 1.000     | 222908   | 1.56            |                 | 31.9  |       |
| * 6 13C2-PFOA                   |       |           |           |           |          |                 |                 |       |       |
| 415.00 > 370.00                 | 1.760 | 1.760     | 0.0       |           | 1328558  | 10.0            |                 | 8386  |       |
| 5 Perfluorooctanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 413.00 > 369.00                 | 1.760 | 1.760     | 0.0       | 1.000     | 784169   | 5.39            |                 | 101   |       |
| 413.00 > 169.00                 | 1.760 | 1.760     | 0.0       | 1.000     | 436864   |                 | 1.79(0.00-0.00) | 861   |       |
| * 7 13C4 PFOS                   |       |           |           |           |          |                 |                 |       |       |
| 503.00 > 80.00                  | 1.988 | 1.995     | -0.007    |           | 2933682  | 28.7            |                 | 2448  |       |
| 9 Perfluorononanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 463.00 > 419.00                 | 2.003 | 2.003     | 0.0       | 1.000     | 80268    | 0.7665          |                 | 8.2   |       |
| 8 Perfluorooctane sulfonic acid |       |           |           |           |          |                 |                 |       |       |
| 499.00 > 80.00                  | 1.995 | 2.018     | -0.023    | 1.000     | 500388   | 4.48            |                 | 175   |       |
| 499.00 > 99.00                  | 1.988 | 2.018     | -0.030    | 0.996     | 96555    |                 | 5.18(0.00-0.00) | 144   |       |
| \$ 10 13C2 PFDA                 |       |           |           |           |          |                 |                 |       |       |
| 515.00 > 470.00                 | 2.208 | 2.208     | 0.0       | 1.000     | 1096533  | 10.1            |                 | 10001 |       |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_035.d

Injection Date: 08-Aug-2018 05:37:01

Instrument ID: A8\_N

Lims ID: 320-41679-A-7-A

Lab Sample ID: 320-41679-7

Client ID: NAWC-073118-RW-179

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 22

Worklist Smp#: 15

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

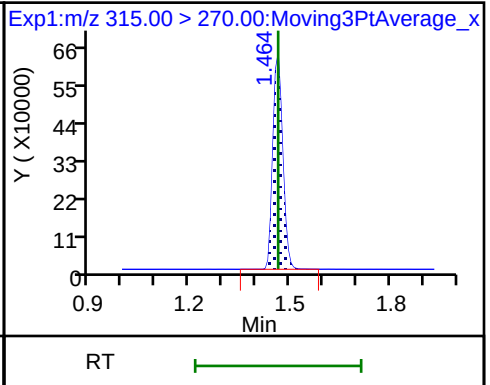
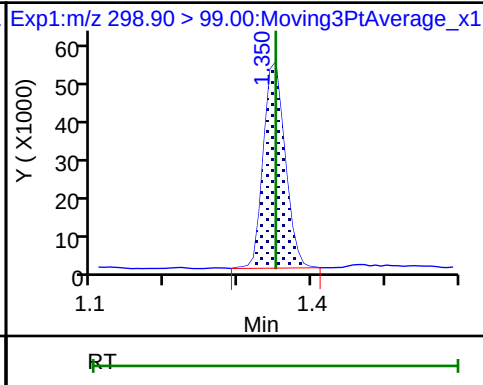
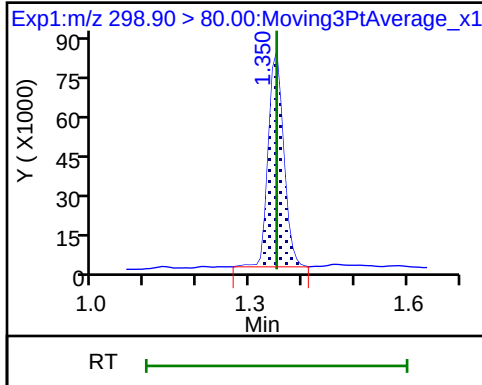
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

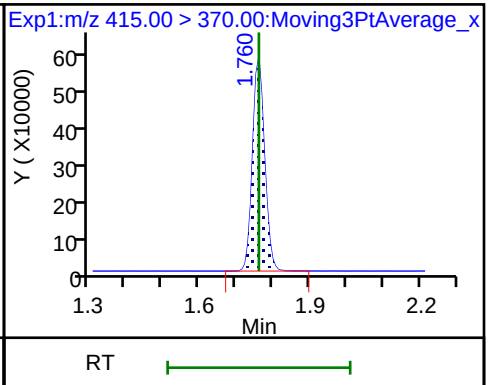
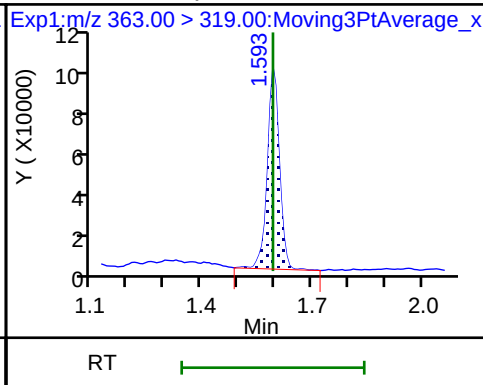
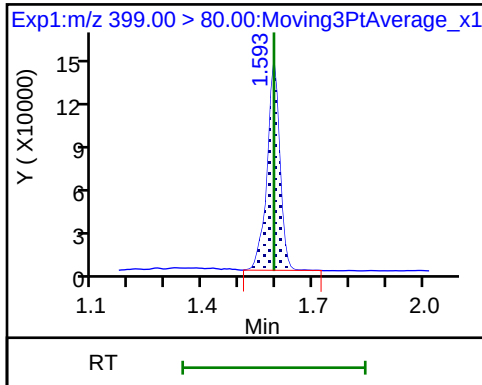
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

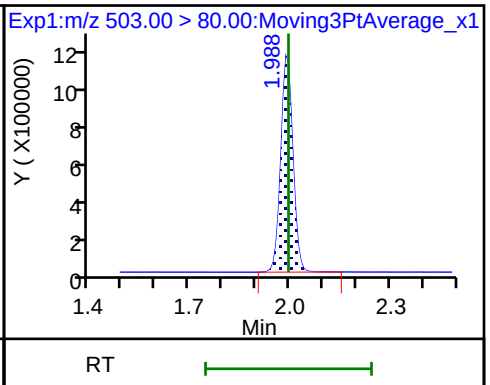
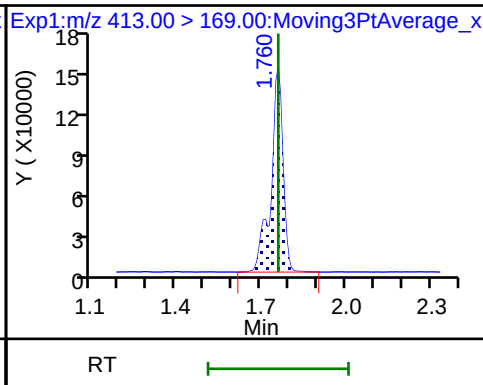
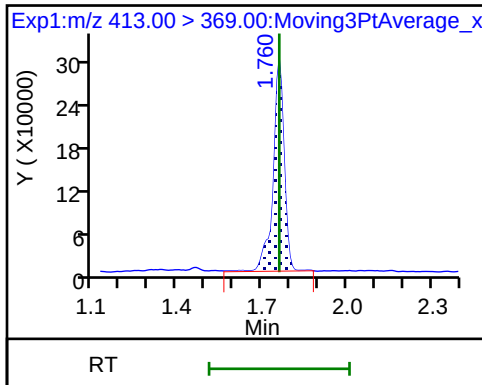
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

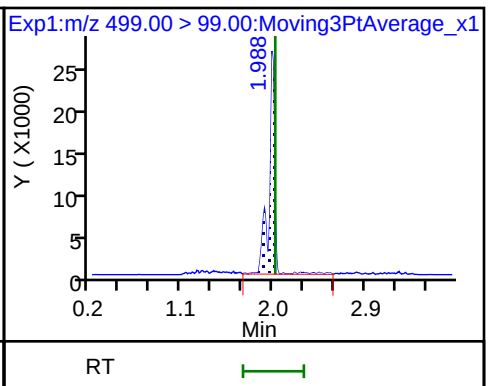
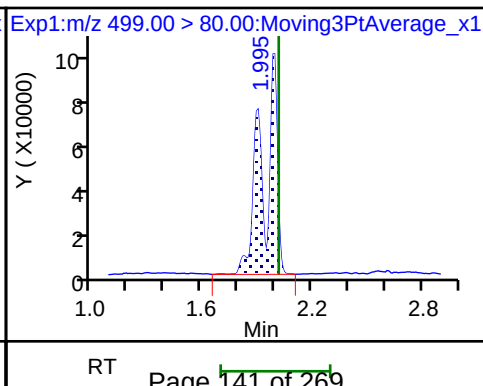
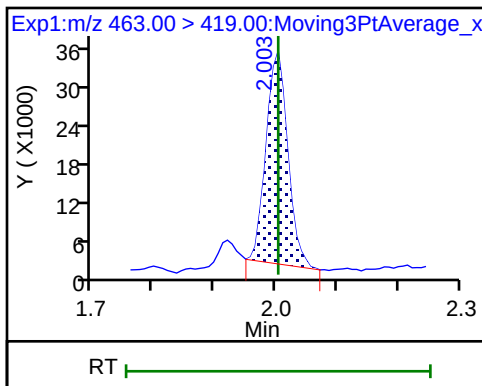
## \* 7 13C4 PFOS



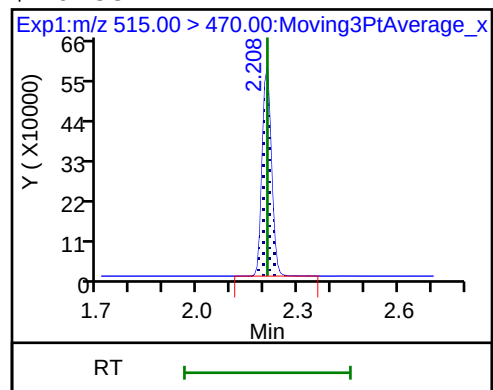
## 9 Perfluorononanoic acid

## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA





TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_035.d  
Lims ID: 320-41679-A-7-A  
Client ID: NAWC-073118-RW-179  
Sample Type: Client  
Inject. Date: 08-Aug-2018 05:37:01 ALS Bottle#: 22 Worklist Smp#: 15  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-41679-a-7-a  
Misc. Info.: Plate: 1 Rack: 2  
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
Column 1 : Det: EXP1  
Process Host: XAWRK002

First Level Reviewer: barnettj

Date: 08-Aug-2018 13:46:22

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.71             | 87.11  |
| \$ 10 13C2 PFDA | 10.0         | 10.1             | 100.79 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                             |
|----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-41679-1</u>                 |
| SDG No.: _____                               |                                             |
| Client Sample ID: <u>NAWC-073118-FRB-179</u> | Lab Sample ID: <u>320-41679-8</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2018.08.07_537C_036.d</u>   |
| Analysis Method: <u>537</u>                  | Date Collected: <u>07/31/2018 12:05</u>     |
| Extraction Method: <u>537</u>                | Date Extracted: <u>08/04/2018 08:24</u>     |
| Sample wt/vol: <u>252.9(mL)</u>              | Date Analyzed: <u>08/08/2018 05:41</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>           | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>238612</u>            | Units: <u>ng/L</u>                          |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 40  | 16  | 6.7 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.9    | U | 20  | 7.9 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 7.9 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 30  | 12  | 5.4 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 4.0    | U | 9.9 | 4.0 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 36     | U | 89  | 36  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 87   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 101  |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_036.d  
 Lims ID: 320-41679-A-8-A  
 Client ID: NAWC-073118-FRB-179  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 05:41:41 ALS Bottle#: 23 Worklist Smp#: 16  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41679-a-8-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Signal          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits) | S/N   | Flags |
|-----------------|-------|-----------|-----------|-----------|----------|-----------------|---------------|-------|-------|
| \$ 2 13C2 PFHxA |       |           |           |           |          |                 |               |       |       |
| 315.00 > 270.00 | 1.464 | 1.464     | 0.0       | 1.000     | 1280263  | 8.69            |               | 12361 |       |
| * 6 13C2-PFOA   |       |           |           |           |          |                 |               |       |       |
| 415.00 > 370.00 | 1.760 | 1.760     | 0.0       |           | 1340148  | 10.0            |               | 8862  |       |
| * 7 13C4 PFOS   |       |           |           |           |          |                 |               |       |       |
| 503.00 > 80.00  | 1.988 | 1.995     | -0.007    |           | 2940104  | 28.7            |               | 3509  |       |
| \$ 10 13C2 PFDA |       |           |           |           |          |                 |               |       |       |
| 515.00 > 470.00 | 2.208 | 2.208     | 0.0       | 1.000     | 1111791  | 10.1            |               | 8861  |       |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_036.d

Injection Date: 08-Aug-2018 05:41:41

Instrument ID: A8\_N

Lims ID: 320-41679-A-8-A

Lab Sample ID: 320-41679-8

Client ID: NAWC-073118-FRB-179

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 23

Worklist Smp#: 16

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

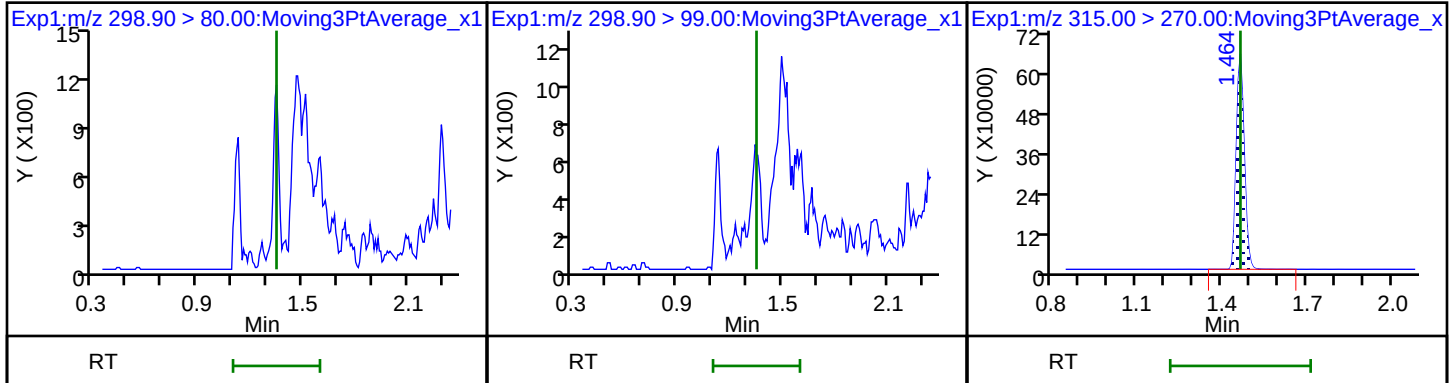
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

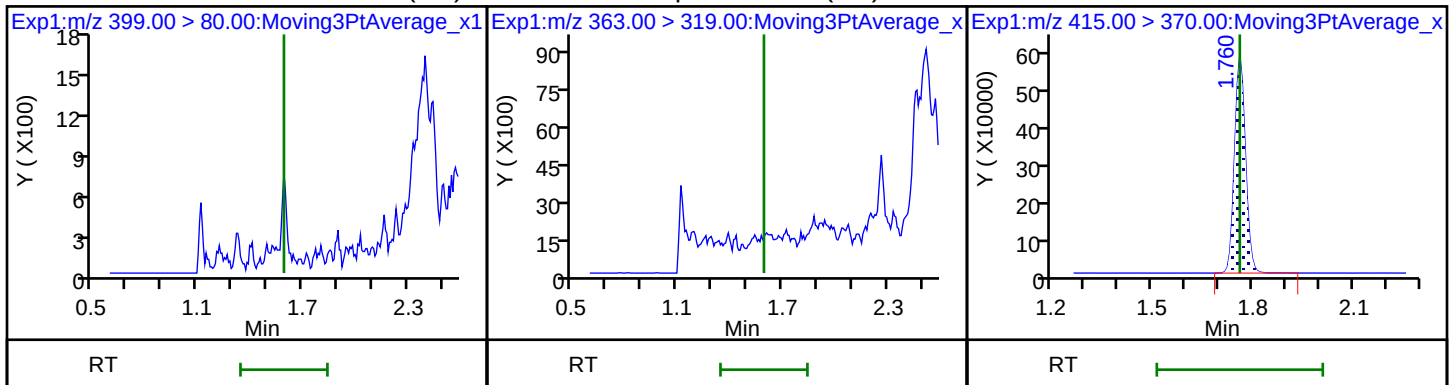
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

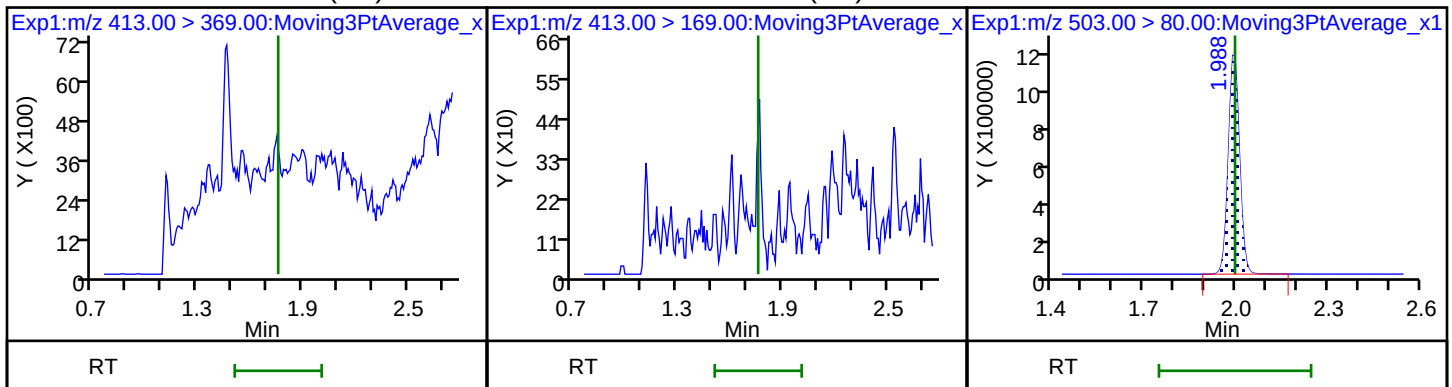
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

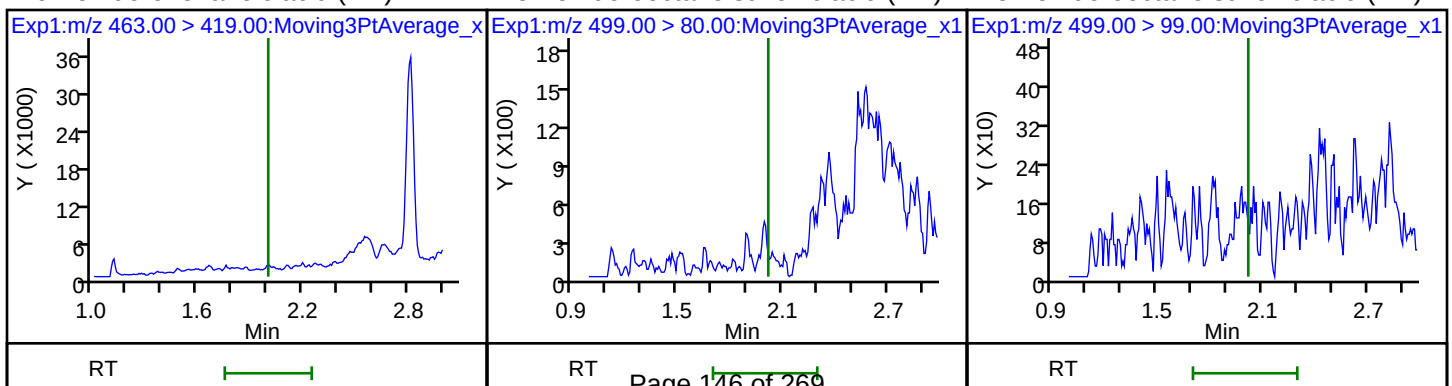
\* 7 13C4 PFOS



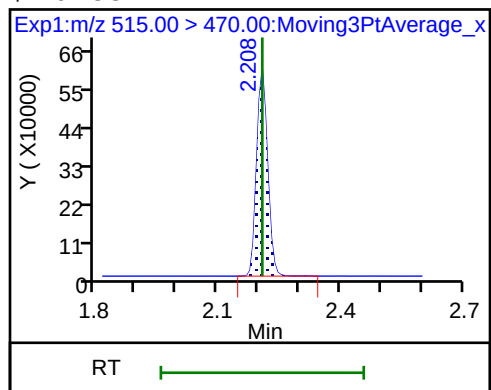
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_036.d  
Lims ID: 320-41679-A-8-A  
Client ID: NAWC-073118-FRB-179  
Sample Type: Client  
Inject. Date: 08-Aug-2018 05:41:41 ALS Bottle#: 23 Worklist Smp#: 16  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-41679-a-8-a  
Misc. Info.: Plate: 1 Rack: 2  
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.69             | 86.88  |
| \$ 10 13C2 PFDA | 10.0         | 10.1             | 101.31 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                             |                                              |
|---------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>     | Job No.: <u>320-41679-1</u>                  |
| SDG No.: _____                              |                                              |
| Client Sample ID: <u>NAWC-073118-RW-124</u> | Lab Sample ID: <u>320-41679-9</u>            |
| Matrix: <u>Water</u>                        | Lab File ID: <u>2018.08.07_537C_037.d</u>    |
| Analysis Method: <u>537</u>                 | Date Collected: <u>07/31/2018 12:40</u>      |
| Extraction Method: <u>537</u>               | Date Extracted: <u>08/04/2018 08:24</u>      |
| Sample wt/vol: <u>253.7 (mL)</u>            | Date Analyzed: <u>08/08/2018 05:46</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>         | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>             | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                           | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>238612</u>           | Units: <u>ng/L</u>                           |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 31     | J | 39  | 16  | 6.7 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 20     |   | 20  | 7.9 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 7.9 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 14     | J | 30  | 12  | 5.4 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 4.7    | J | 9.9 | 3.9 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 89  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 83   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 94   |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_037.d  
 Lims ID: 320-41679-A-9-A  
 Client ID: NAWC-073118-RW-124  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 05:46:21 ALS Bottle#: 24 Worklist Smp#: 17  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41679-a-9-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj

Date: 08-Aug-2018 13:46:45

| Signal                          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 298.90 > 80.00                  | 1.350 | 1.350     | 0.0       | 1.000     | 216646   | 1.66            |                 | 147   |       |
| 298.90 > 99.00                  | 1.350 | 1.350     | 0.0       | 1.000     | 138765   |                 | 1.56(0.00-0.00) | 198   |       |
| \$ 2 13C2 PFHxA                 |       |           |           |           |          |                 |                 |       |       |
| 315.00 > 270.00                 | 1.464 | 1.464     | 0.0       | 1.000     | 1338054  | 8.30            |                 | 13207 |       |
| 3 Perfluorohexanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 399.00 > 80.00                  | 1.593 | 1.593     | 0.0       | 1.000     | 681084   | 3.46            |                 | 397   |       |
| 4 Perfluoroheptanoic acid       |       |           |           |           |          |                 |                 |       |       |
| 363.00 > 319.00                 | 1.593 | 1.593     | 0.0       | 1.000     | 189466   | 1.20            |                 | 28.4  |       |
| * 6 13C2-PFOA                   |       |           |           |           |          |                 |                 |       |       |
| 415.00 > 370.00                 | 1.760 | 1.760     | 0.0       |           | 1465526  | 10.0            |                 | 10227 |       |
| 5 Perfluorooctanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 413.00 > 369.00                 | 1.760 | 1.760     | 0.0       | 1.000     | 824045   | 5.13            |                 | 99.3  |       |
| 413.00 > 169.00                 | 1.760 | 1.760     | 0.0       | 1.000     | 471423   |                 | 1.75(0.00-0.00) | 921   |       |
| * 7 13C4 PFOS                   |       |           |           |           |          |                 |                 |       |       |
| 503.00 > 80.00                  | 1.995 | 1.995     | 0.0       |           | 3163107  | 28.7            |                 | 2587  |       |
| 9 Perfluorononanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 463.00 > 419.00                 | 2.003 | 2.003     | 0.0       | 1.000     | 63656    | 0.5511          |                 | 6.7   |       |
| 8 Perfluorooctane sulfonic acid |       |           |           |           |          |                 |                 |       |       |
| 499.00 > 80.00                  | 1.995 | 2.018     | -0.023    | 1.000     | 934608   | 7.76            |                 | 294   |       |
| 499.00 > 99.00                  | 1.995 | 2.018     | -0.023    | 1.000     | 176008   |                 | 5.31(0.00-0.00) | 291   |       |
| \$ 10 13C2 PFDA                 |       |           |           |           |          |                 |                 |       |       |
| 515.00 > 470.00                 | 2.208 | 2.208     | 0.0       | 1.000     | 1130188  | 9.42            |                 | 9140  |       |



## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_037.d

Injection Date: 08-Aug-2018 05:46:21

Instrument ID: A8\_N

Lims ID: 320-41679-A-9-A

Lab Sample ID: 320-41679-9

Client ID: NAWC-073118-RW-124

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 24

Worklist Smp#: 17

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

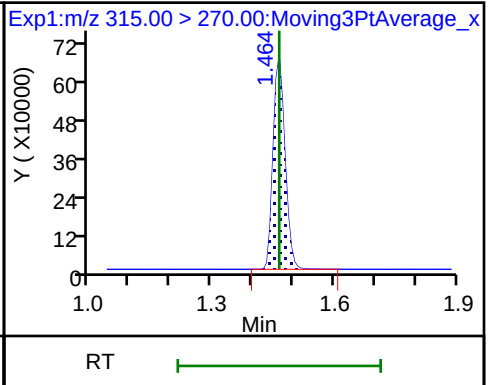
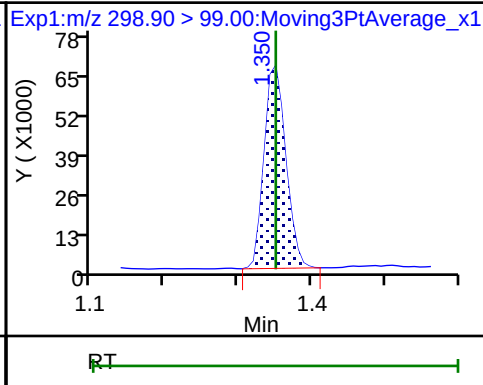
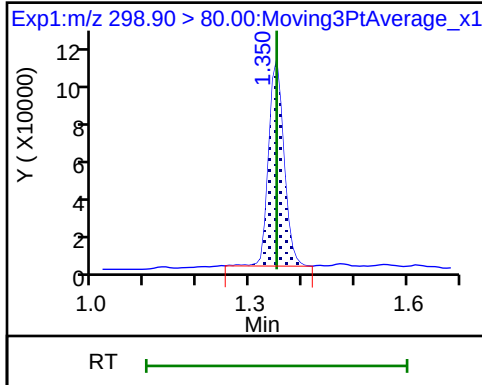
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

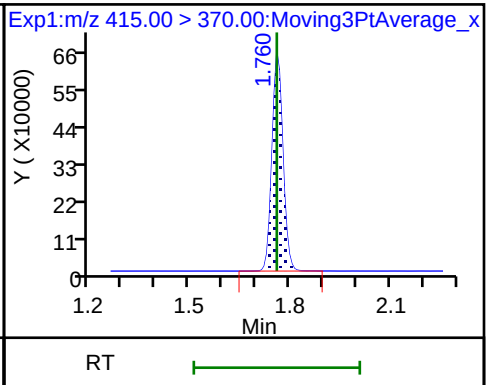
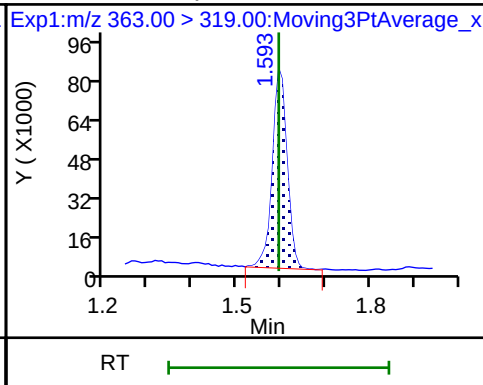
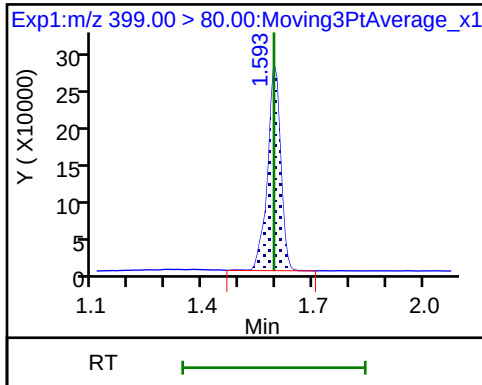
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

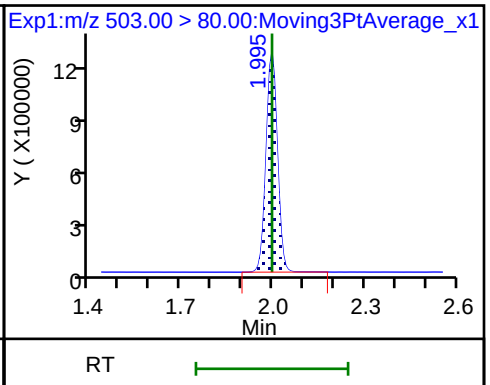
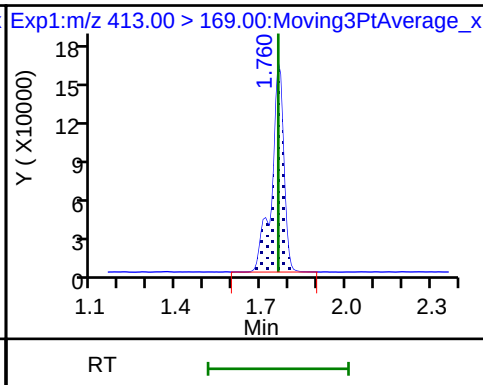
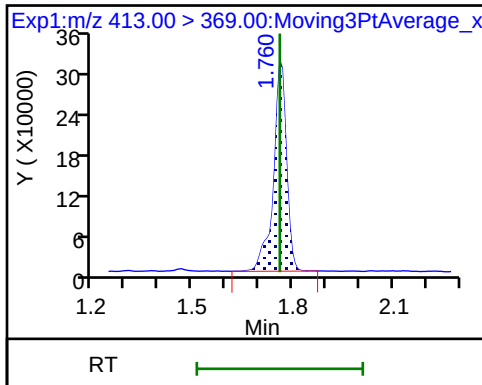
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

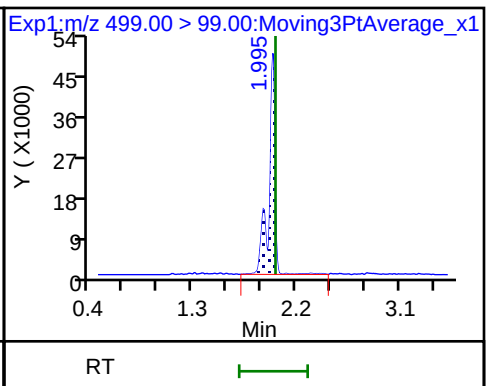
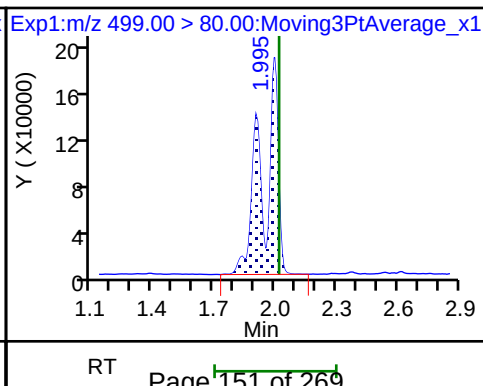
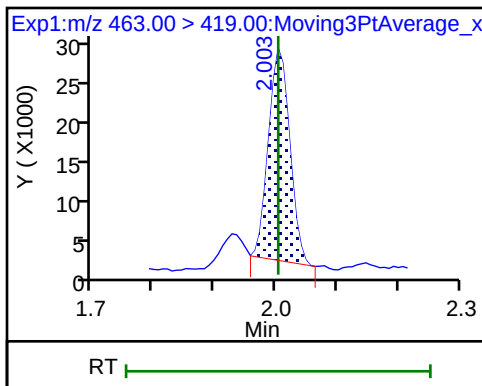
## \* 7 13C4 PFOS



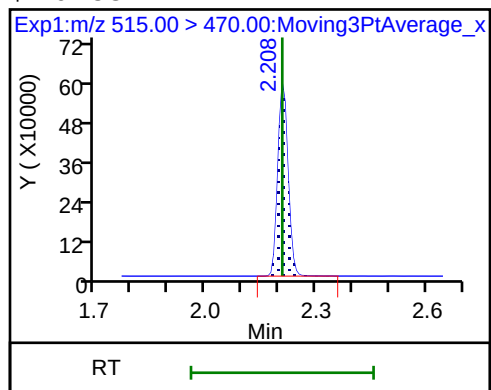
## 9 Perfluorononanoic acid

## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_037.d  
Lims ID: 320-41679-A-9-A  
Client ID: NAWC-073118-RW-124  
Sample Type: Client  
Inject. Date: 08-Aug-2018 05:46:21 ALS Bottle#: 24 Worklist Smp#: 17  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-41679-a-9-a  
Misc. Info.: Plate: 1 Rack: 2  
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
Column 1 : Det: EXP1  
Process Host: XAWRK002

First Level Reviewer: barnettj

Date: 08-Aug-2018 13:46:45

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.30             | 83.03  |
| \$ 10 13C2 PFDA | 10.0         | 9.42             | 94.18  |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                              |
|----------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-41679-1</u>                  |
| SDG No.: _____                               |                                              |
| Client Sample ID: <u>NAWC-073118-FRB-124</u> | Lab Sample ID: <u>320-41679-10</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2018.08.07_537C_038.d</u>    |
| Analysis Method: <u>537</u>                  | Date Collected: <u>07/31/2018 12:35</u>      |
| Extraction Method: <u>537</u>                | Date Extracted: <u>08/04/2018 08:24</u>      |
| Sample wt/vol: <u>254.5 (mL)</u>             | Date Analyzed: <u>08/08/2018 05:51</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>          | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>              | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>238612</u>            | Units: <u>ng/L</u>                           |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 39  | 16  | 6.7 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.9    | U | 20  | 7.9 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 7.9 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 29  | 12  | 5.4 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 3.9    | U | 9.8 | 3.9 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 88  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 87   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 91   |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_038.d  
 Lims ID: 320-41679-A-10-A  
 Client ID: NAWC-073118-FRB-124  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 05:51:01 ALS Bottle#: 25 Worklist Smp#: 18  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41679-a-10-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Signal          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits) | S/N   | Flags |
|-----------------|-------|-----------|-----------|-----------|----------|-----------------|---------------|-------|-------|
| \$ 2 13C2 PFHxA |       |           |           |           |          |                 |               |       |       |
| 315.00 > 270.00 | 1.464 | 1.464     | 0.0       | 1.000     | 1256150  | 8.66            |               | 11481 |       |
| * 6 13C2-PFOA   |       |           |           |           |          |                 |               |       |       |
| 415.00 > 370.00 | 1.760 | 1.760     | 0.0       |           | 1319545  | 10.0            |               | 8299  |       |
| * 7 13C4 PFOS   |       |           |           |           |          |                 |               |       |       |
| 503.00 > 80.00  | 1.988 | 1.995     | -0.007    |           | 2963050  | 28.7            |               | 3539  |       |
| \$ 10 13C2 PFDA |       |           |           |           |          |                 |               |       |       |
| 515.00 > 470.00 | 2.208 | 2.208     | 0.0       | 1.000     | 980100   | 9.07            |               | 7113  |       |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_038.d

Injection Date: 08-Aug-2018 05:51:01

Instrument ID: A8\_N

Lims ID: 320-41679-A-10-A

Lab Sample ID: 320-41679-10

Client ID: NAWC-073118-FRB-124

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 25

Worklist Smp#: 18

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

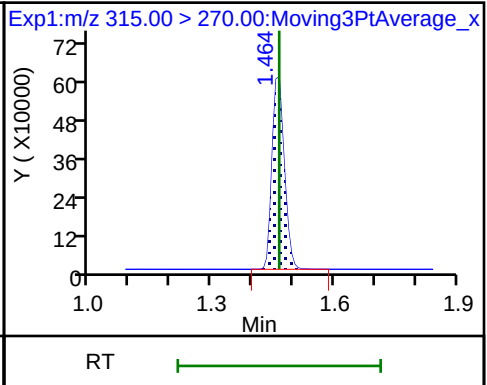
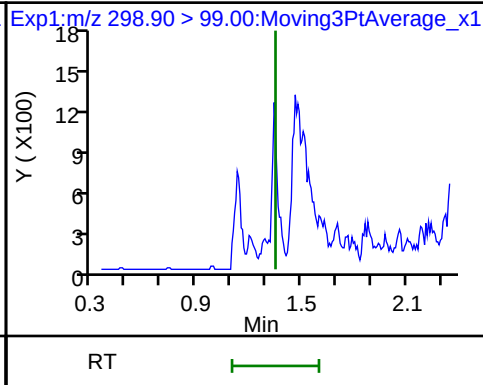
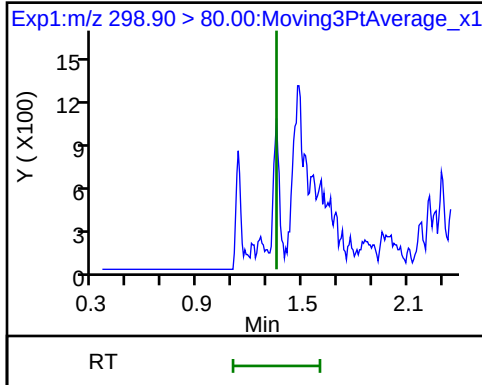
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

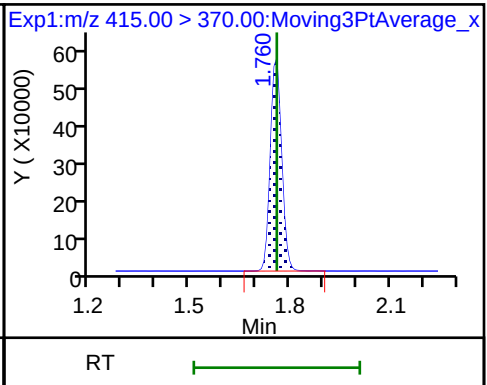
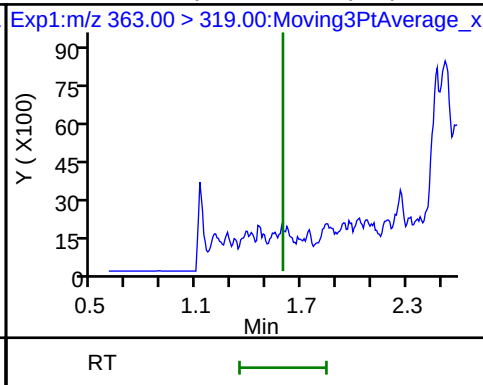
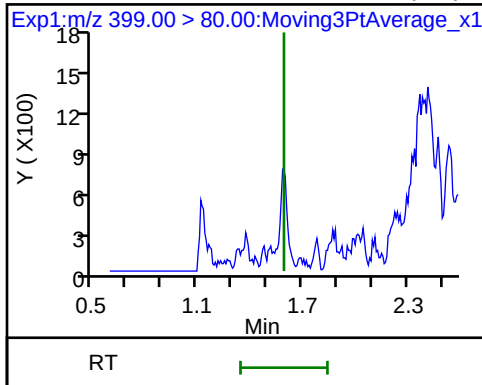
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

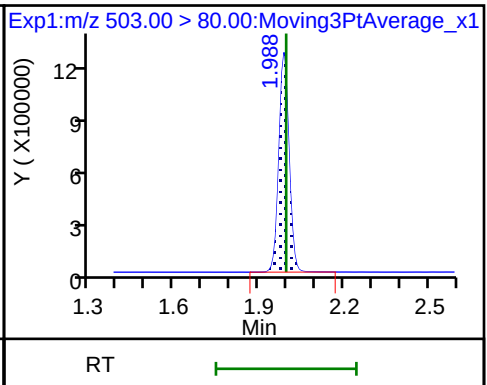
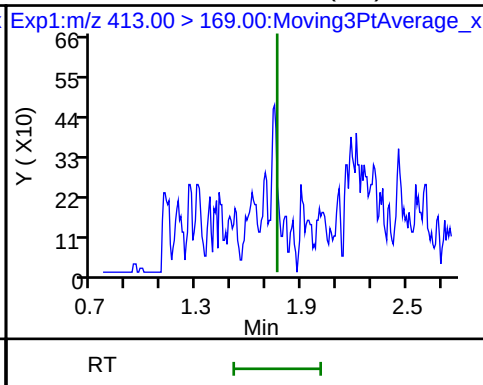
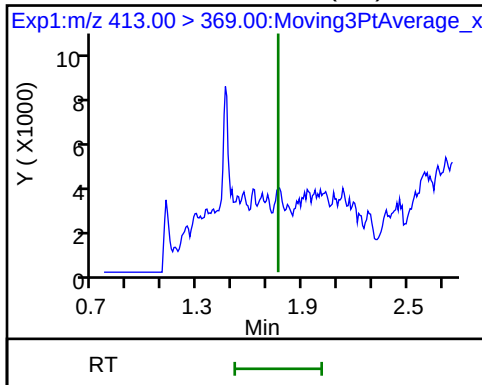
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

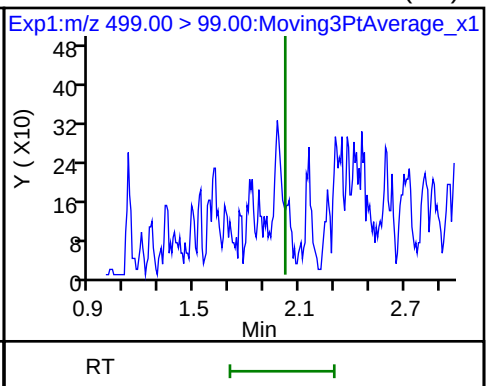
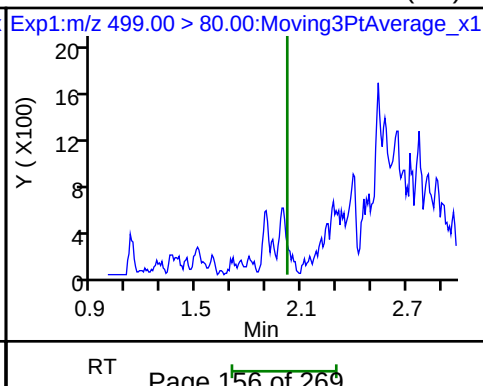
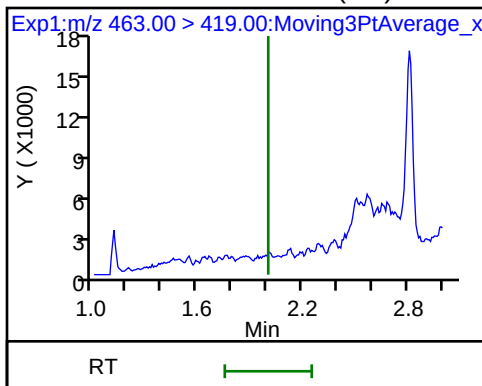
\* 7 13C4 PFOS



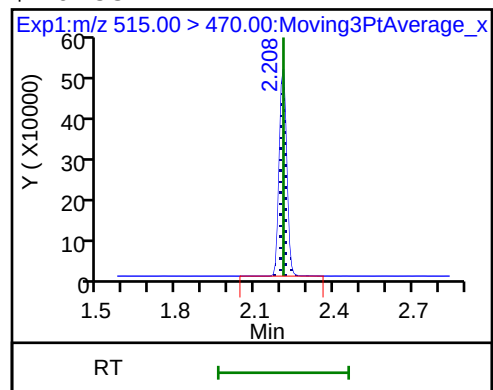
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_038.d  
Lims ID: 320-41679-A-10-A  
Client ID: NAWC-073118-FRB-124  
Sample Type: Client  
Inject. Date: 08-Aug-2018 05:51:01 ALS Bottle#: 25 Worklist Smp#: 18  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-41679-a-10-a  
Misc. Info.: Plate: 1 Rack: 2  
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.66             | 86.57  |
| \$ 10 13C2 PFDA | 10.0         | 9.07             | 90.71  |



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                              |
|----------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-41679-1</u>                  |
| SDG No.: _____                               |                                              |
| Client Sample ID: <u>WGNA-073118-RW-3103</u> | Lab Sample ID: <u>320-41679-11</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2018.08.07_537C_039.d</u>    |
| Analysis Method: <u>537</u>                  | Date Collected: <u>07/31/2018 13:40</u>      |
| Extraction Method: <u>537</u>                | Date Extracted: <u>08/04/2018 08:24</u>      |
| Sample wt/vol: <u>259.2 (mL)</u>             | Date Analyzed: <u>08/08/2018 05:55</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>          | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>              | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>238612</u>            | Units: <u>ng/L</u>                           |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q   | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|-----|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 7.1    | J   | 39  | 15  | 6.6 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 8.3    | J   | 19  | 7.7 | 2.7 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U   | 23  | 19  | 7.7 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U   | 29  | 12  | 5.3 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 2.4    | J M | 9.6 | 3.9 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U M | 87  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 90   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 99   |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_039.d  
 Lims ID: 320-41679-A-11-A  
 Client ID: WGNA-073118-RW-3103  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 05:55:42 ALS Bottle#: 26 Worklist Smp#: 19  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41679-a-11-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj

Date: 08-Aug-2018 13:47:45

| Signal                          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |           |           |           |          |                 |                 |       | M     |
| 298.90 > 80.00                  | 1.343 | 1.350     | -0.007    | 1.000     | 112695   | 1.09            |                 | 91.0  |       |
| 298.90 > 99.00                  | 1.343 | 1.350     | -0.007    | 1.000     | 75927    |                 | 1.48(0.00-0.00) | 115   | M     |
| \$ 2 13C2 PFHxA                 |       |           |           |           |          |                 |                 |       |       |
| 315.00 > 270.00                 | 1.457 | 1.464     | -0.007    | 1.000     | 1111564  | 8.98            |                 | 11188 |       |
| 3 Perfluorohexanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 399.00 > 80.00                  | 1.593 | 1.593     | 0.0       | 1.000     | 192115   | 1.24            |                 | 127   |       |
| 4 Perfluoroheptanoic acid       |       |           |           |           |          |                 |                 |       | M     |
| 363.00 > 319.00                 | 1.593 | 1.593     | 0.0       | 1.000     | 75617    | 0.6248          |                 | 11.8  | M     |
| * 6 13C2-PFOA                   |       |           |           |           |          |                 |                 |       |       |
| 415.00 > 370.00                 | 1.753 | 1.760     | -0.007    |           | 1125238  | 10.0            |                 | 6944  |       |
| 5 Perfluorooctanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 413.00 > 369.00                 | 1.760 | 1.760     | 0.0       | 1.000     | 264518   | 2.15            |                 | 32.2  |       |
| 413.00 > 169.00                 | 1.760 | 1.760     | 0.0       | 1.000     | 151376   |                 | 1.75(0.00-0.00) | 293   |       |
| * 7 13C4 PFOS                   |       |           |           |           |          |                 |                 |       |       |
| 503.00 > 80.00                  | 1.988 | 1.995     | -0.007    |           | 2495650  | 28.7            |                 | 2450  |       |
| 8 Perfluorooctane sulfonic acid |       |           |           |           |          |                 |                 |       |       |
| 499.00 > 80.00                  | 1.988 | 2.018     | -0.030    | 1.000     | 175394   | 1.85            |                 | 54.1  |       |
| 499.00 > 99.00                  | 1.988 | 2.018     | -0.030    | 1.000     | 32854    |                 | 5.34(0.00-0.00) | 52.5  |       |
| \$ 10 13C2 PFDA                 |       |           |           |           |          |                 |                 |       |       |
| 515.00 > 470.00                 | 2.208 | 2.208     | 0.0       | 1.000     | 908228   | 9.86            |                 | 6606  |       |

## QC Flag Legend

### Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_039.d

Injection Date: 08-Aug-2018 05:55:42

Instrument ID: A8\_N

Lims ID: 320-41679-A-11-A

Lab Sample ID: 320-41679-11

Client ID: WGNA-073118-RW-3103

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 26

Worklist Smp#: 19

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

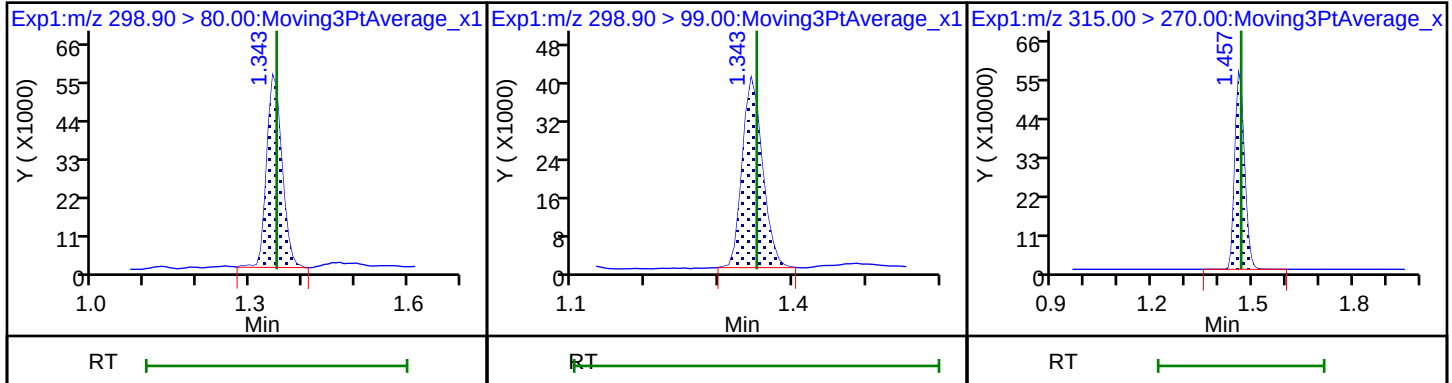
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (M)

1 Perfluorobutanesulfonic acid (M)

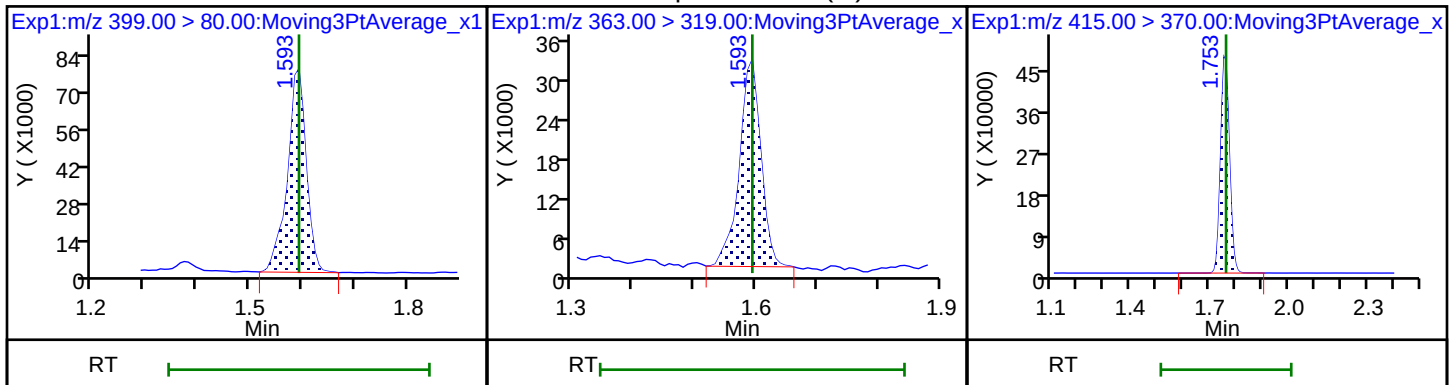
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid (M)

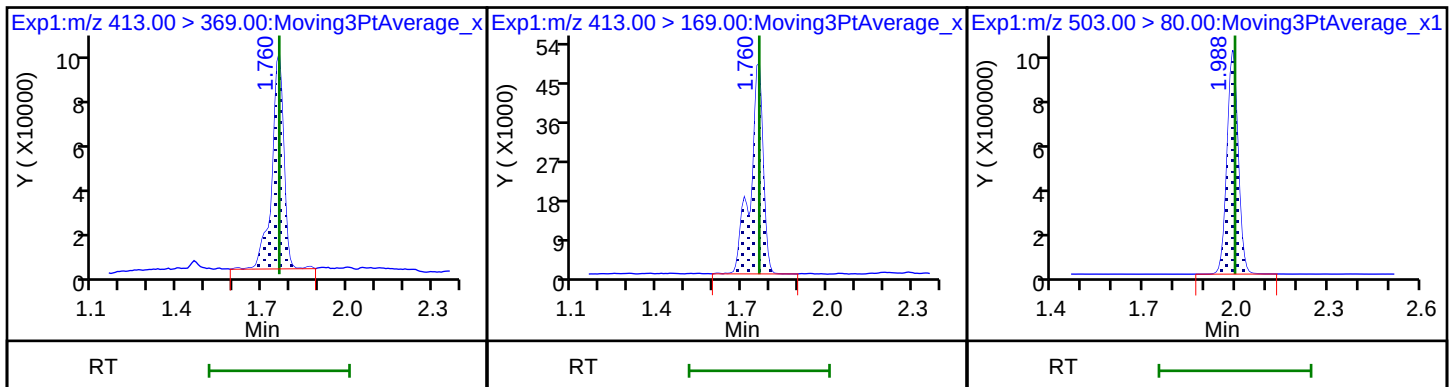
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

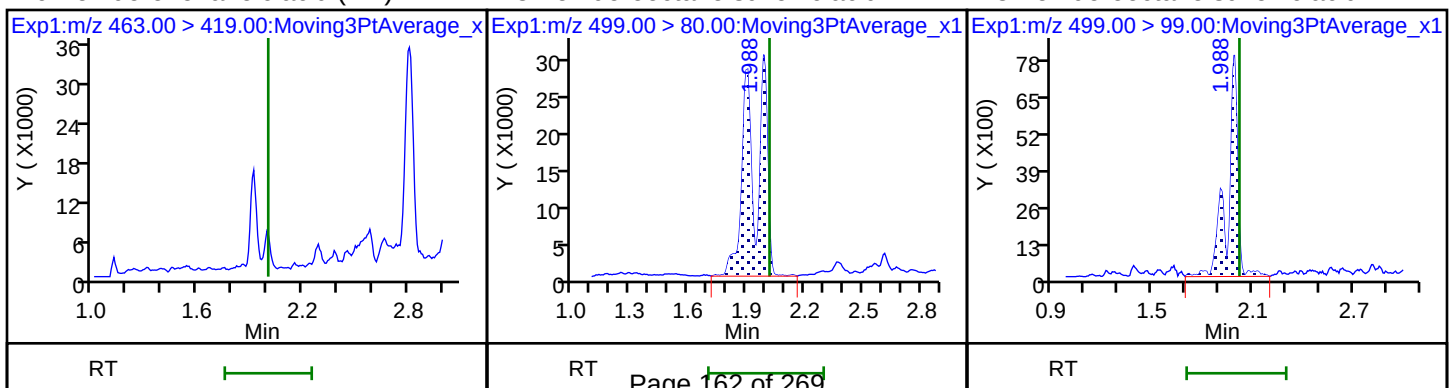
\* 7 13C4 PFOS



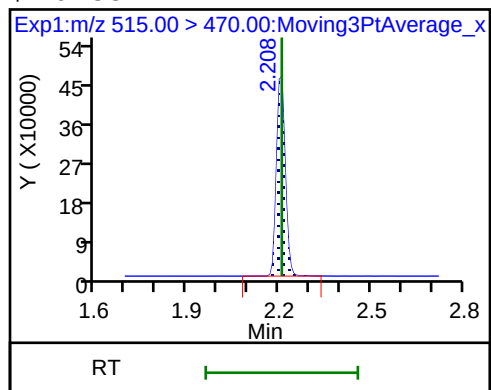
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_039.d  
Lims ID: 320-41679-A-11-A  
Client ID: WGNA-073118-RW-3103  
Sample Type: Client  
Inject. Date: 08-Aug-2018 05:55:42 ALS Bottle#: 26 Worklist Smp#: 19  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-41679-a-11-a  
Misc. Info.: Plate: 1 Rack: 2  
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
Column 1 : Det: EXP1  
Process Host: XAWRK002

First Level Reviewer: barnettj

Date: 08-Aug-2018 13:47:45

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.98             | 89.84  |
| \$ 10 13C2 PFDA | 10.0         | 9.86             | 98.57  |

## TestAmerica Sacramento

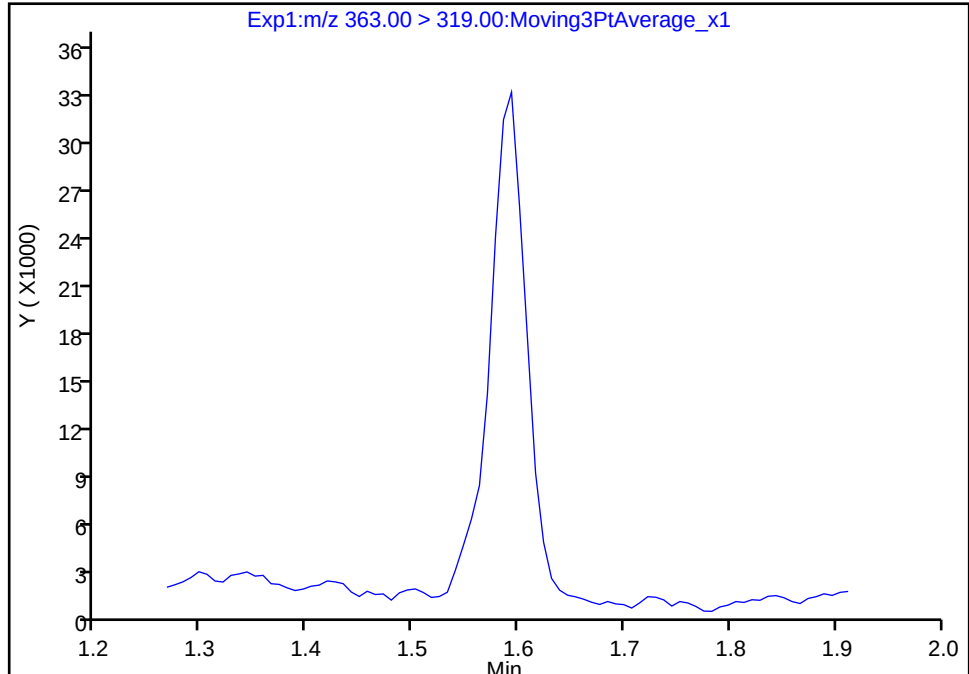
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Injection Date: 08-Aug-2018 05:55:42 Instrument ID: A8\_N  
Lims ID: 320-41679-A-11-A Lab Sample ID: 320-41679-11  
Client ID: WGNA-073118-RW-3103  
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 26 Worklist Smp#: 19  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

**4 Perfluoroheptanoic acid, CAS: 375-85-9**

Signal: 1

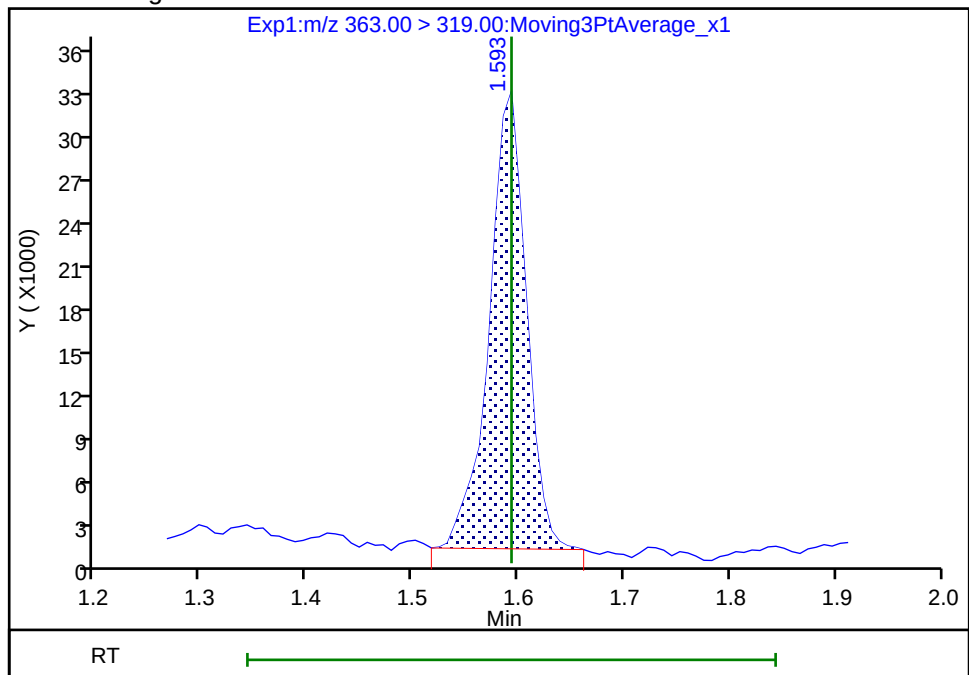
Not Detected  
Expected RT: 1.59

## Processing Integration Results



## Manual Integration Results

RT: 1.59  
Area: 75617  
Amount: 0.624757  
Amount Units: ng/ml



Reviewer: barnettj, 08-Aug-2018 13:47:28  
Audit Action: Manually Integrated

Audit Reason: Missed Peak  
Page 165 of 269

## TestAmerica Sacramento

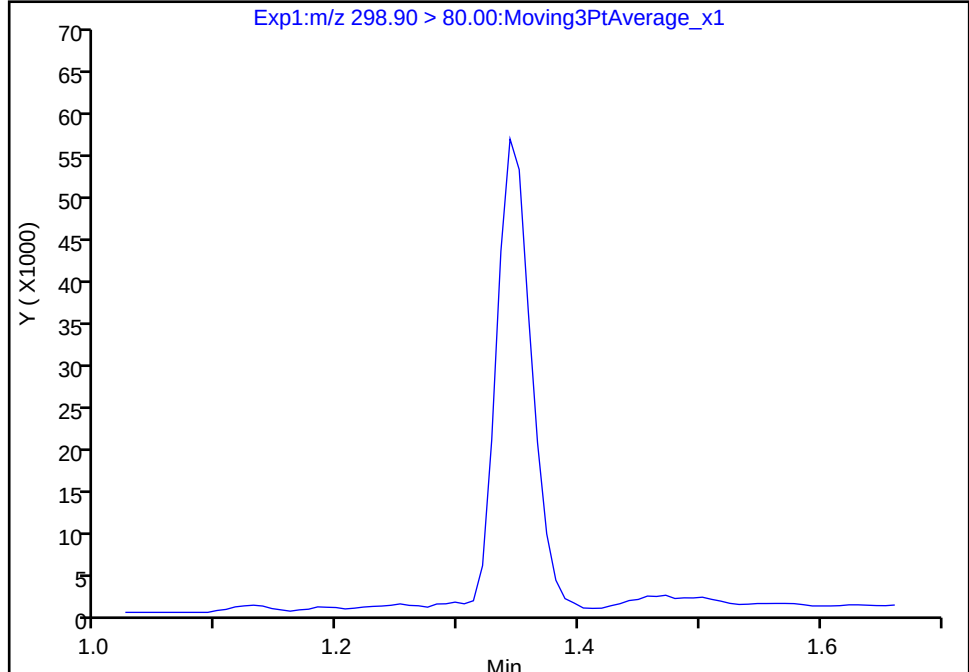
|                 |                                                                            |                |              |                |    |
|-----------------|----------------------------------------------------------------------------|----------------|--------------|----------------|----|
| Data File:      | \\ChromNa\Sacramento\ChromData\A8_N\20180807-62321.b\2018.08.07_537C_039.d |                |              |                |    |
| Injection Date: | 08-Aug-2018 05:55:42                                                       | Instrument ID: | A8_N         |                |    |
| Lims ID:        | 320-41679-A-11-A                                                           | Lab Sample ID: | 320-41679-11 |                |    |
| Client ID:      | WGNA-073118-RW-3103                                                        |                |              |                |    |
| Operator ID:    | \\SACINSTLCMS01@tai.com                                                    | ALS Bottle#:   | 26           | Worklist Smp#: | 19 |
| Injection Vol:  | 2.0 ul                                                                     | Dil. Factor:   | 1.0000       |                |    |
| Method:         | 537_A8_N                                                                   | Limit Group:   | LC 537 ICAL  |                |    |
| Column:         |                                                                            | Detector       | EXP1         |                |    |

**1 Perfluorobutanesulfonic acid, CAS: 375-73-5**

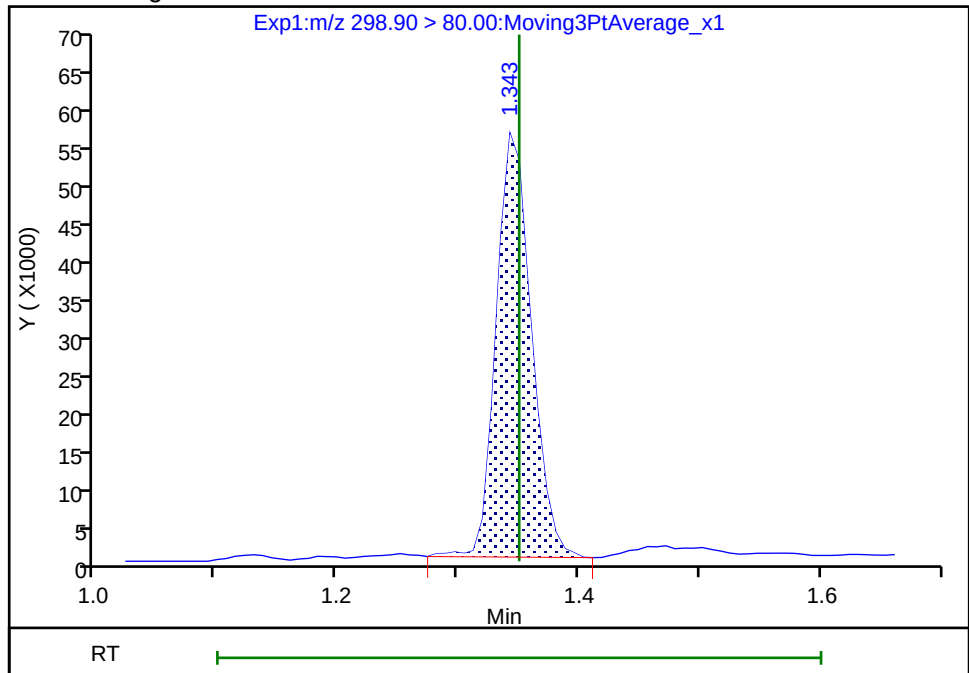
Signal: 1

Not Detected  
Expected RT: 1.35

## Processing Integration Results



## Manual Integration Results

RT: 1.34  
Area: 112695  
Amount: 1.093625  
Amount Units: ng/ml

Reviewer: barnettj, 08-Aug-2018 13:47:02

Audit Action: Assigned Compound ID

Audit Reason: Peak assignment corrected



## TestAmerica Sacramento

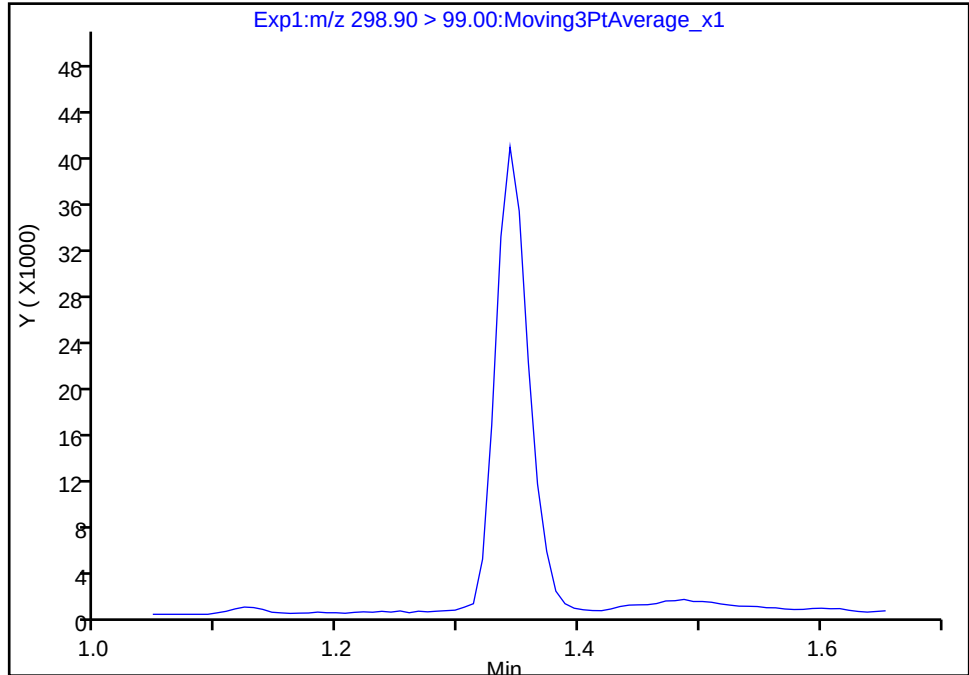
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_039.d  
Injection Date: 08-Aug-2018 05:55:42 Instrument ID: A8\_N  
Lims ID: 320-41679-A-11-A Lab Sample ID: 320-41679-11  
Client ID: WGNA-073118-RW-3103  
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 26 Worklist Smp#: 19  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

**1 Perfluorobutanesulfonic acid, CAS: 375-73-5**

Signal: 2

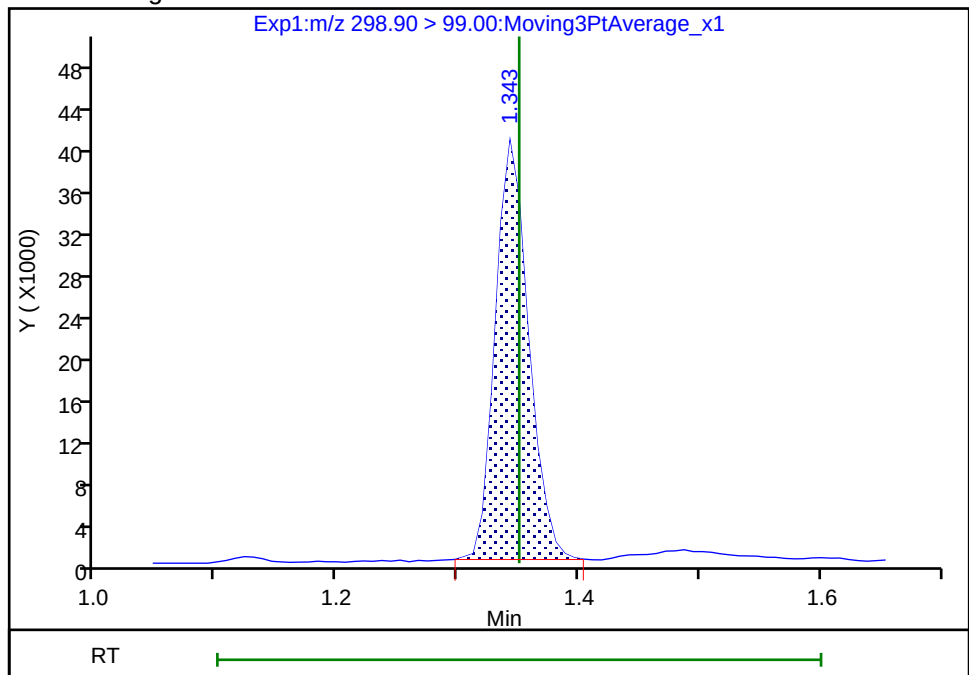
Not Detected  
Expected RT: 1.35

## Processing Integration Results



## Manual Integration Results

RT: 1.34  
Area: 75927  
Amount: 1.093625  
Amount Units: ng/ml



Reviewer: barnettj, 08-Aug-2018 13:47:15

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                               |                                             |
|-----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>       | Job No.: <u>320-41679-1</u>                 |
| SDG No.: _____                                |                                             |
| Client Sample ID: <u>WGNA-073118-FRB-3103</u> | Lab Sample ID: <u>320-41679-12</u>          |
| Matrix: <u>Water</u>                          | Lab File ID: <u>2018.08.07_537C_040.d</u>   |
| Analysis Method: <u>537</u>                   | Date Collected: <u>07/31/2018 13:35</u>     |
| Extraction Method: <u>537</u>                 | Date Extracted: <u>08/04/2018 08:24</u>     |
| Sample wt/vol: <u>260.7(mL)</u>               | Date Analyzed: <u>08/08/2018 06:00</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>            | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>                | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                             | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>238612</u>             | Units: <u>ng/L</u>                          |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 15     | U | 38  | 15  | 6.5 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.7    | U | 19  | 7.7 | 2.7 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U | 23  | 19  | 7.7 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 29  | 12  | 5.3 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 3.8    | U | 9.6 | 3.8 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 86  | 35  | 15  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 85   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 92   |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_040.d  
 Lims ID: 320-41679-A-12-A  
 Client ID: WGNA-073118-FRB-3103  
 Sample Type: Client  
 Inject. Date: 08-Aug-2018 06:00:22 ALS Bottle#: 27 Worklist Smp#: 20  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41679-a-12-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Signal          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits) | S/N   | Flags |
|-----------------|-------|-----------|-----------|-----------|----------|-----------------|---------------|-------|-------|
| \$ 2 13C2 PFHxA |       |           |           |           |          |                 |               |       |       |
| 315.00 > 270.00 | 1.464 | 1.464     | 0.0       | 1.000     | 1107076  | 8.53            |               | 10869 |       |
| * 6 13C2-PFOA   |       |           |           |           |          |                 |               |       |       |
| 415.00 > 370.00 | 1.760 | 1.760     | 0.0       |           | 1179781  | 10.0            |               | 8000  |       |
| * 7 13C4 PFOS   |       |           |           |           |          |                 |               |       |       |
| 503.00 > 80.00  | 1.988 | 1.995     | -0.007    |           | 2532682  | 28.7            |               | 3122  |       |
| \$ 10 13C2 PFDA |       |           |           |           |          |                 |               |       |       |
| 515.00 > 470.00 | 2.208 | 2.208     | 0.0       | 1.000     | 885020   | 9.16            |               | 8267  |       |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_040.d

Injection Date: 08-Aug-2018 06:00:22

Instrument ID: A8\_N

Lims ID: 320-41679-A-12-A

Lab Sample ID: 320-41679-12

Client ID: WGNA-073118-FRB-3103

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 27

Worklist Smp#: 20

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

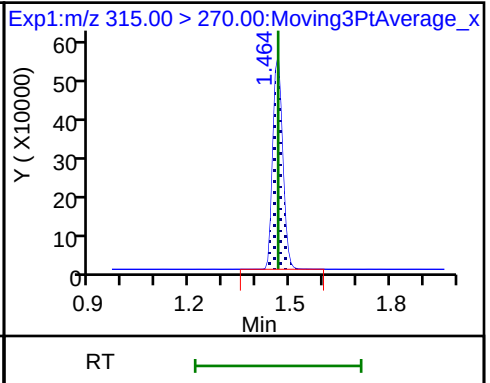
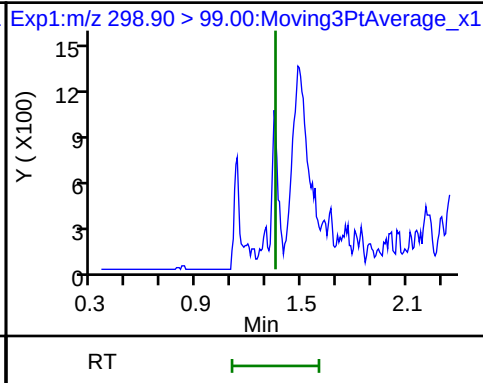
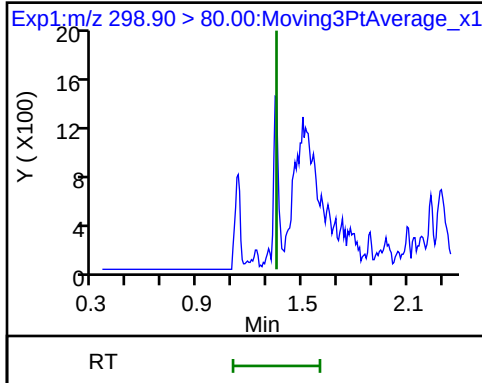
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

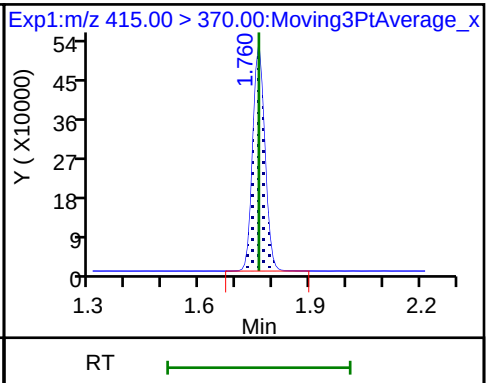
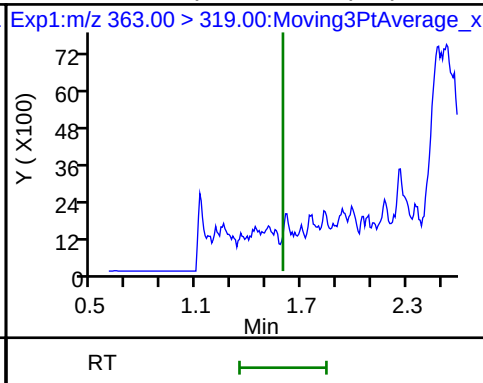
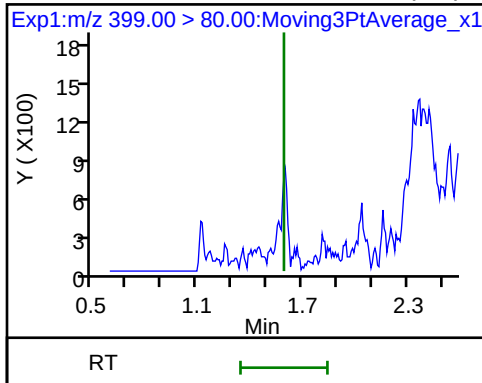
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

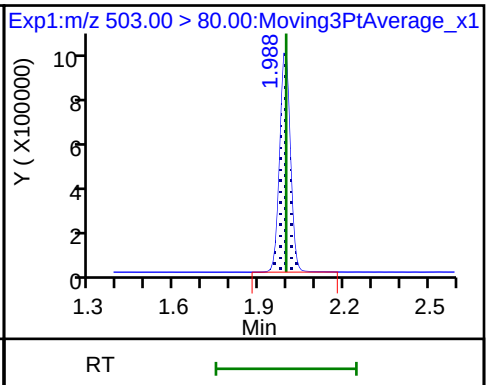
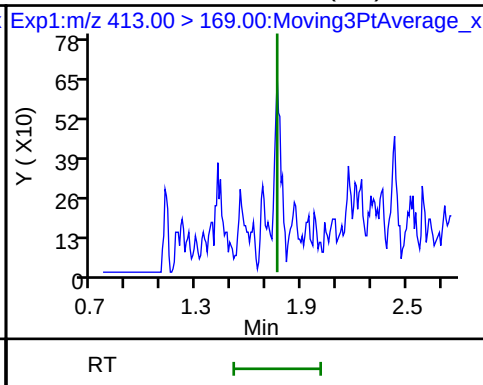
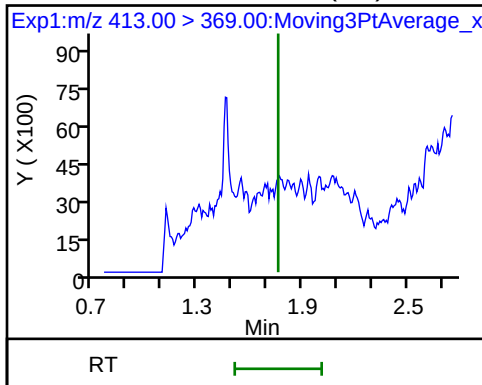
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

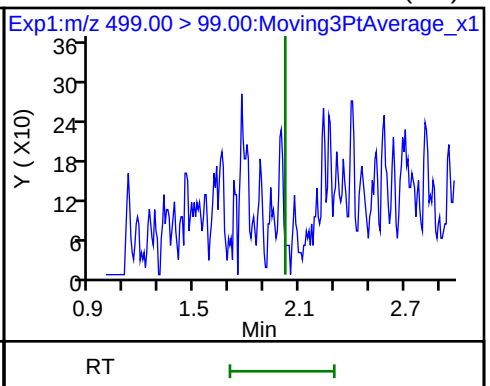
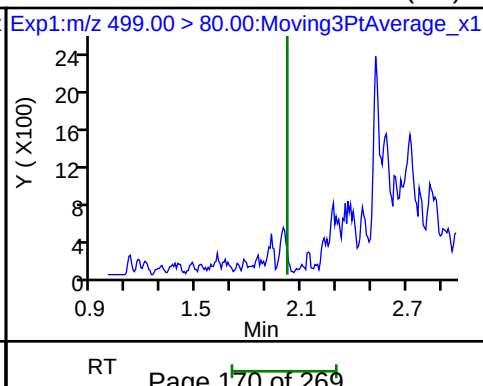
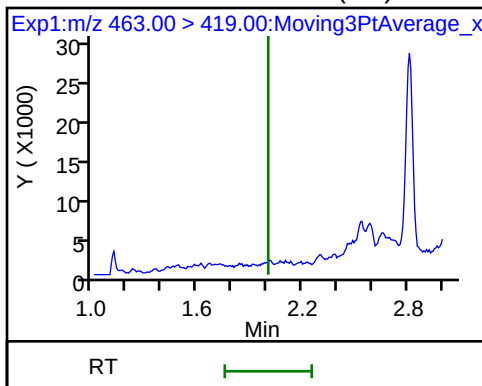
\* 7 13C4 PFOS



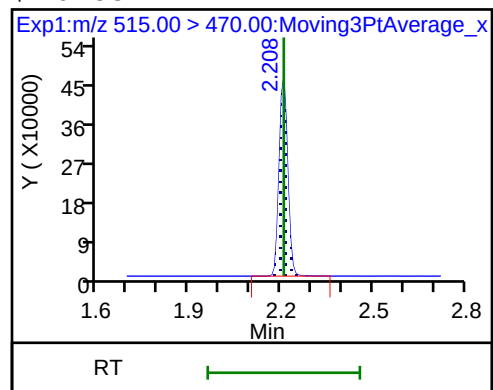
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_040.d  
Lims ID: 320-41679-A-12-A  
Client ID: WGNA-073118-FRB-3103  
Sample Type: Client  
Inject. Date: 08-Aug-2018 06:00:22 ALS Bottle#: 27 Worklist Smp#: 20  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-41679-a-12-a  
Misc. Info.: Plate: 1 Rack: 2  
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.53             | 85.34  |
| \$ 10 13C2 PFDA | 10.0         | 9.16             | 91.61  |

FORM VI  
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA  
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1 Analy Batch No.: 238469

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

|         |                 |                           |
|---------|-----------------|---------------------------|
| LEVEL:  | LAB SAMPLE ID:  | LAB FILE ID:              |
| Level 1 | IC 320-238469/2 | 2018.08.07_537CURVE_003.d |
| Level 2 | IC 320-238469/3 | 2018.08.07_537CURVE_004.d |
| Level 3 | IC 320-238469/4 | 2018.08.07_537CURVE_005.d |
| Level 4 | IC 320-238469/5 | 2018.08.07_537CURVE_006.d |
| Level 5 | IC 320-238469/6 | 2018.08.07_537CURVE_007.d |
| Level 6 | IC 320-238469/7 | 2018.08.07_537CURVE_008.d |

| ANALYTE                              | RRF              |        |        |        |        | CURVE<br>TYPE | COEFFICIENT |        |    | # | MIN RRF | %RSD | # | MAX<br>%RSD | R^2<br>OR COD | # | MIN R^2<br>OR COD |
|--------------------------------------|------------------|--------|--------|--------|--------|---------------|-------------|--------|----|---|---------|------|---|-------------|---------------|---|-------------------|
|                                      | LVL 1<br>LVL 6   | LVL 2  | LVL 3  | LVL 4  | LVL 5  |               | B           | M1     | M2 |   |         |      |   |             |               |   |                   |
| Perfluorobutanesulfonic acid (PFBS)  | 1.2685<br>1.0148 | 1.2167 | 1.2831 | 1.2045 | 1.1178 | Ave           |             | 1.1842 |    |   |         | 8.6  |   | 30.0        |               |   |                   |
| Perfluorohexanesulfonic acid (PFHxS) | 1.7386<br>1.7965 | 1.7248 | 1.7859 | 1.8499 | 1.8020 | Ave           |             | 1.7830 |    |   |         | 2.6  |   | 30.0        |               |   |                   |
| Perfluoroheptanoic acid (PFHpA)      | ++++<br>1.0701   | 1.0598 | 1.0963 | 1.0908 | 1.0612 | Ave           |             | 1.0756 |    |   |         | 1.6  |   | 30.0        |               |   |                   |
| Perfluorooctanoic acid (PFOA)        | 1.1708<br>1.0787 | 1.0454 | 1.0799 | 1.1146 | 1.0831 | Ave           |             | 1.0954 |    |   |         | 3.9  |   | 30.0        |               |   |                   |
| Perfluorooctanesulfonic acid (PFOS)  | 1.0605<br>1.1104 | 1.0466 | 1.1058 | 1.0956 | 1.1304 | Ave           |             | 1.0915 |    |   |         | 2.9  |   | 30.0        |               |   |                   |
| Perfluorononanoic acid (PFNA)        | 0.7952<br>0.7829 | 0.7632 | 0.7779 | 0.8207 | 0.7892 | Ave           |             | 0.7882 |    |   |         | 2.5  |   | 30.0        |               |   |                   |
| 13C2 PFHxA                           | 1.1215<br>1.1209 | 1.0683 | 1.0729 | 1.1134 | 1.1007 | Ave           |             | 1.0996 |    |   |         | 2.2  |   | 30.0        |               |   |                   |
| 13C2 PFDA                            | 0.8149<br>0.8273 | 0.8350 | 0.7672 | 0.8515 | 0.8172 | Ave           |             | 0.8189 |    |   |         | 3.5  |   | 30.0        |               |   |                   |

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI  
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA  
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1 Analy Batch No.: 238469

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

| LEVEL:  | LAB SAMPLE ID:  | LAB FILE ID:              |
|---------|-----------------|---------------------------|
| Level 1 | IC 320-238469/2 | 2018.08.07_537CURVE_003.d |
| Level 2 | IC 320-238469/3 | 2018.08.07_537CURVE_004.d |
| Level 3 | IC 320-238469/4 | 2018.08.07_537CURVE_005.d |
| Level 4 | IC 320-238469/5 | 2018.08.07_537CURVE_006.d |
| Level 5 | IC 320-238469/6 | 2018.08.07_537CURVE_007.d |
| Level 6 | IC 320-238469/7 | 2018.08.07_537CURVE_008.d |

| ANALYTE                                 | IS<br>REF  | CURVE<br>TYPE | RESPONSE            |         |         |         |          | CONCENTRATION (NG/ML) |       |       |       |       |
|-----------------------------------------|------------|---------------|---------------------|---------|---------|---------|----------|-----------------------|-------|-------|-------|-------|
|                                         |            |               | LVL 1<br>LVL 6      | LVL 2   | LVL 3   | LVL 4   | LVL 5    | LVL 1<br>LVL 6        | LVL 2 | LVL 3 | LVL 4 | LVL 5 |
| Perfluorobutanesulfonic acid (PFBS)     | PFOS       | Ave           | 1093854<br>16487048 | 2326382 | 5241287 | 9203217 | 13659010 | 9.00<br>180           | 20.0  | 45.0  | 90.1  | 135   |
| Perfluorohexanesulfonic acid<br>(PFHxS) | PFOS       | Ave           | 500314<br>9803009   | 1107645 | 2450188 | 4747515 | 7395512  | 3.00<br>60.5          | 6.72  | 15.1  | 30.2  | 45.4  |
| Perfluoroheptanoic acid (PFHpA)         | 13PF<br>OA | Ave           | ++++<br>2459664     | 275735  | 621773  | 1128009 | 1828933  | ++++<br>19.4          | 2.16  | 4.86  | 9.72  | 14.6  |
| Perfluorooctanoic acid (PFOA)           | 13PF<br>OA | Ave           | 277484<br>5050799   | 554036  | 1247621 | 2347790 | 3802739  | 1.98<br>39.6          | 4.40  | 9.90  | 19.8  | 29.7  |
| Perfluorooctanesulfonic acid (PFOS)     | PFOS       | Ave           | 401757<br>7918924   | 878368  | 1982811 | 3674504 | 6063022  | 3.95<br>79.1          | 8.79  | 19.8  | 39.5  | 59.3  |
| Perfluorononanoic acid (PFNA)           | 13PF<br>OA | Ave           | 188460<br>3665889   | 404484  | 898787  | 1728770 | 2770632  | 1.98<br>39.6          | 4.40  | 9.90  | 19.8  | 29.7  |
| 13C2 PFHxA                              | 13PF<br>OA | Ave           | 1342383<br>1325342  | 1286815 | 1252048 | 1184544 | 1301097  | 10.0<br>10.0          | 10.0  | 10.0  | 10.0  | 10.0  |
| 13C2 PFDA                               | 13PF<br>OA | Ave           | 975454<br>978205    | 1005796 | 895349  | 905914  | 965975   | 10.0<br>10.0          | 10.0  | 10.0  | 10.0  | 10.0  |

Curve Type Legend:

Ave = Average ISTD



FORM VI  
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA  
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1 Analy Batch No.: 238469

SDG No.: \_\_\_\_\_

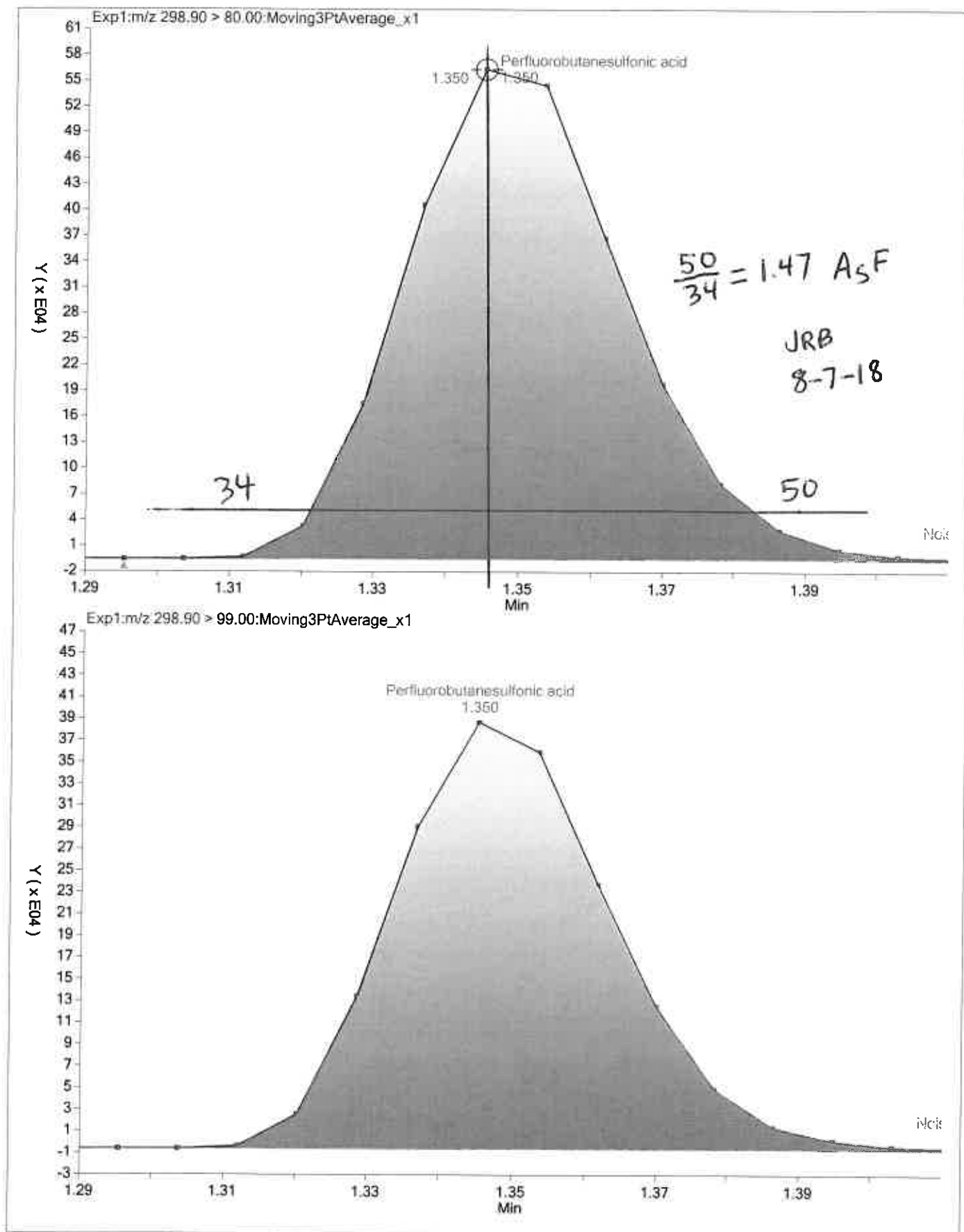
Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

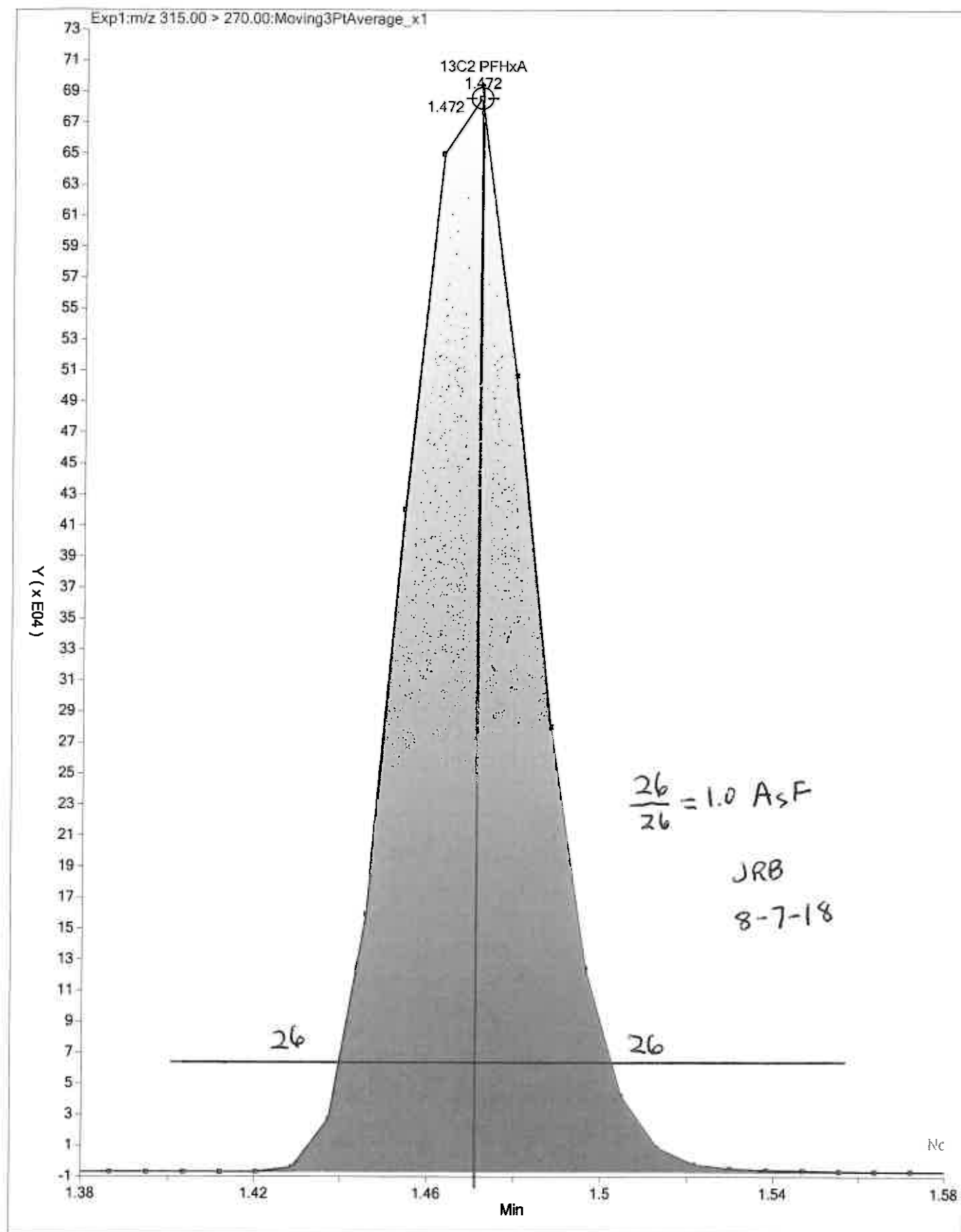
Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

| LEVEL:  | LAB SAMPLE ID:  | LAB FILE ID:              |
|---------|-----------------|---------------------------|
| Level 1 | IC 320-238469/2 | 2018.08.07_537CURVE_003.d |
| Level 2 | IC 320-238469/3 | 2018.08.07_537CURVE_004.d |
| Level 3 | IC 320-238469/4 | 2018.08.07_537CURVE_005.d |
| Level 4 | IC 320-238469/5 | 2018.08.07_537CURVE_006.d |
| Level 5 | IC 320-238469/6 | 2018.08.07_537CURVE_007.d |
| Level 6 | IC 320-238469/7 | 2018.08.07_537CURVE_008.d |

| ANALYTE                              | PERCENT ERROR |         |         |         |         |         | PERCENT ERROR LIMIT |       |       |       |       |       |
|--------------------------------------|---------------|---------|---------|---------|---------|---------|---------------------|-------|-------|-------|-------|-------|
|                                      | LVL 1 #       | LVL 2 # | LVL 3 # | LVL 4 # | LVL 5 # | LVL 6 # | LVL 1               | LVL 2 | LVL 3 | LVL 4 | LVL 5 | LVL 6 |
| Perfluorobutanesulfonic acid (PFBS)  | 7.1           | 2.7     | 8.3     | 1.7     | -5.6    | -14.3   | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluorohexanesulfonic acid (PFHxS) | -2.5          | -3.3    | 0.2     | 3.8     | 1.1     | 0.8     | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluoroheptanoic acid (PFHpA)      | +++++         | -1.5    | 1.9     | 1.4     | -1.3    | -0.5    |                     | 50    | 30    | 30    | 30    | 30    |
| Perfluorooctanoic acid (PFOA)        | 6.9           | -4.6    | -1.4    | 1.7     | -1.1    | -1.5    | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluorooctanesulfonic acid (PFOS)  | -2.8          | -4.1    | 1.3     | 0.4     | 3.6     | 1.7     | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluorononanoic acid (PFNA)        | 0.9           | -3.2    | -1.3    | 4.1     | 0.1     | -0.7    | 50                  | 30    | 30    | 30    | 30    | 30    |
| 13C2 PFHxA                           | 2.0           | -2.8    | -2.4    | 1.3     | 0.1     | 1.9     | 30                  | 30    | 30    | 30    | 30    | 30    |
| 13C2 PFDA                            | -0.5          | 2.0     | -6.3    | 4.0     | -0.2    | 1.0     | 30                  | 30    | 30    | 30    | 30    | 30    |





TestAmerica Laboratories  
Istd/Surrogate Recovery Report

Worklist Name: 07AUG2018\_537\_ICAL

Worklist Num: 62276

Instrument: A8\_N

Method: 537\_A8\_N

Batch Directory: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b

Limit Group: LC 537 ICAI

Analysis Type: SemiVOA

Inj Volume: 2.00

Inj Vol Units: ul

Lims Batch: 238469

CCV IS Mode: Select Ical Level, Cal Level: 3

Non-Cal IS Mode: Last Ccal Sample

\$ 2 13C2 PFHxA

\$ 10 13C2 PFDA

| Lab ID    | Inj Date             | \$ 2 | \$ 10 | * 6 13C2-PFOA        | * 7 13C4 PFOS        |
|-----------|----------------------|------|-------|----------------------|----------------------|
| IS Std    |                      |      |       | 1167019 1.78         | 2601656 2.01         |
| # 1 RB    | 07-Aug-2018 12:39:24 |      |       | 1233209 105.7 1.78   | 2632254 101.2 2.02   |
| IS Std    |                      |      |       |                      |                      |
| # 2 IC L1 | 07-Aug-2018 12:44:03 | 1.47 | 2.22  | 1196979> 100.0* 1.78 | 2748260> 100.0* 2.02 |
| # 3 IC L2 | 07-Aug-2018 12:48:44 | 1.46 | 2.22  | 1204534> 100.6* 1.78 | 2739996> 99.7* 2.02  |
| # 4 IC L3 | 07-Aug-2018 12:53:24 | 1.46 | 2.22  | 1167019> 97.5* 1.78  | 2601656> 94.7* 2.01  |
| # 5 IC L4 | 07-Aug-2018 12:58:05 | 1.47 | 2.22  | 1063858> 88.9* 1.78  | 2433237> 88.5* 2.02  |
| # 6 IC L5 | 07-Aug-2018 13:02:45 | 1.47 | 2.22  | 1182103> 98.8* 1.78  | 2594163> 94.4* 2.02  |
| # 7 IC L6 | 07-Aug-2018 13:07:25 | 1.46 | 2.22  | 1182381> 98.8* 1.77  | 2586897> 94.1* 2.01  |

13C2-PFOA

$$RPD = \frac{1204534 - 1063858}{\frac{1204534 + 1063858}{2}} \times 100 = 12.4$$

13C4-PFOS

$$RPD = \frac{2748260 - 2433237}{\frac{2748260 + 2433237}{2}} \times 100 = 12.2$$

JRB  
8-7-18

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_003.d  
 Lims ID: IC L1  
 Client ID:  
 Sample Type: IC Calib Level: 1  
 Inject. Date: 07-Aug-2018 12:44:03 ALS Bottle#: 1 Worklist Smp#: 2  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L1\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Aug-2018 13:58:29 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK014

First Level Reviewer: barnettj

Date: 07-Aug-2018 13:11:34

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.350 | 1.352  | -0.002 | 1.000  | 1093854  | 9.64         |                 | 1874  |       |
| 298.90 > 99.00                  | 1.350 | 1.352  | -0.002 | 1.000  | 747872   |              | 1.46(0.00-0.00) | 1304  |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.472 | 1.468  | 0.004  | 1.000  | 1342383  | 10.2         |                 | 10671 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.601 | 1.603  | -0.002 | 1.000  | 500314   | 2.93         |                 | 500   |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.608 | 1.605  | 0.003  | 1.000  | 643116   | 5.00         |                 | 166   |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.775 | 1.774  | 0.001  |        | 1196979  | 10.0         |                 | 7793  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.775 | 1.775  | 0.0    | 1.000  | 277484   | 2.12         |                 | 37.2  |       |
| 413.00 > 169.00                 | 1.775 | 1.775  | 0.0    | 1.000  | 141293   |              | 1.96(0.00-0.00) | 340   |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 2.018 | 2.016  | 0.002  |        | 2748260  | 28.7         |                 | 3570  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 2.018 | 2.018  | 0.0    | 1.000  | 401757   | 3.84         |                 | 501   |       |
| 499.00 > 99.00                  | 2.018 | 2.018  | 0.0    | 1.000  | 92241    |              | 4.36(0.00-0.00) | 257   |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 2.026 | 2.024  | 0.002  | 1.000  | 188460   | 2.00         |                 | 33.7  |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.223 | 2.220  | 0.003  | 1.000  | 975454   | 9.95         |                 | 7598  |       |

**Reagents:**

LC537-L1\_00022

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_003.d

Injection Date: 07-Aug-2018 12:44:03

Instrument ID: A8\_N

Lims ID: IC L1

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 1

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

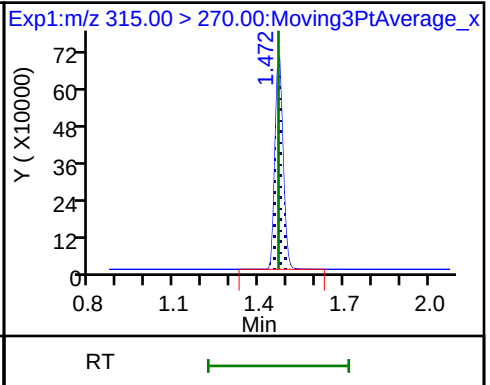
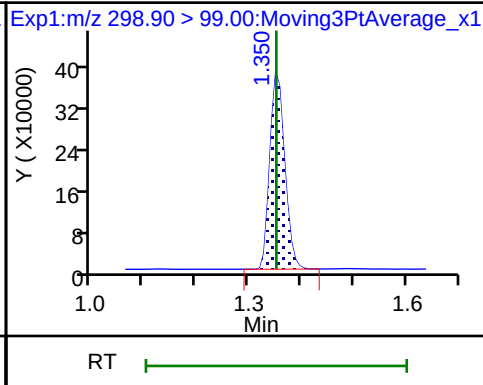
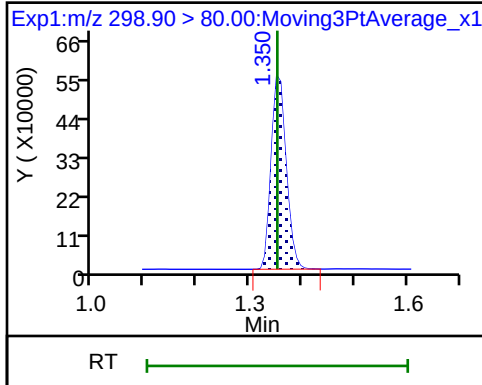
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

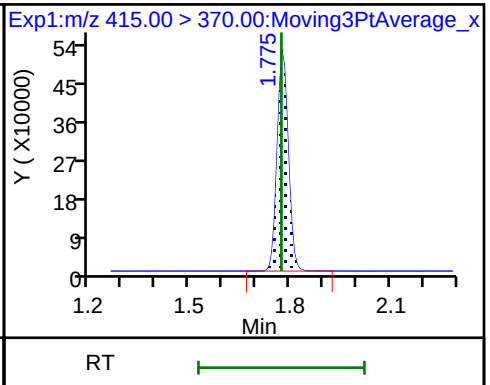
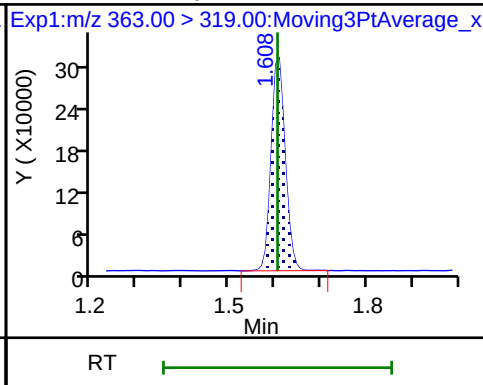
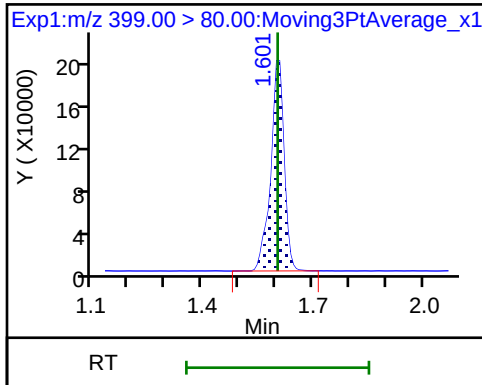
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

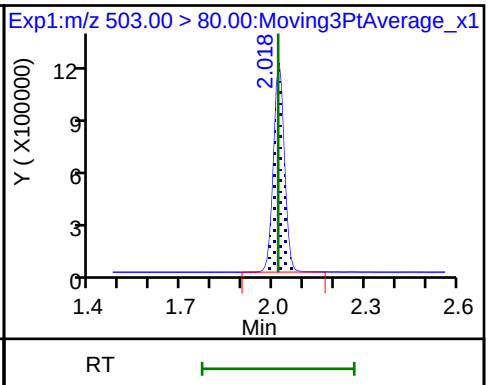
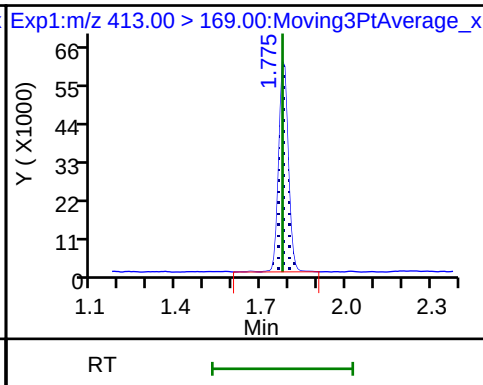
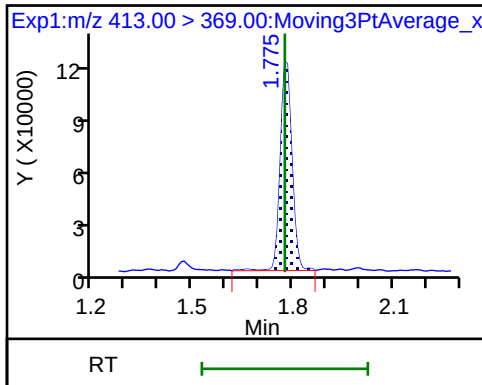
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

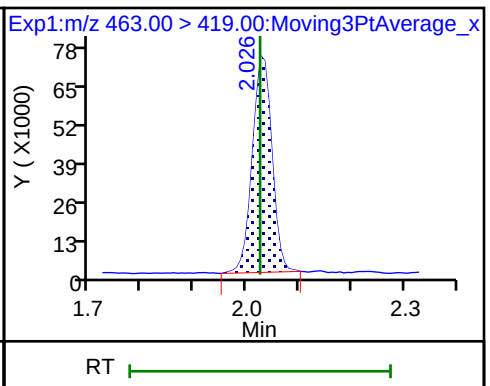
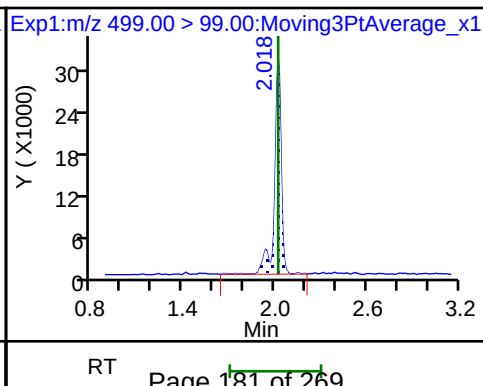
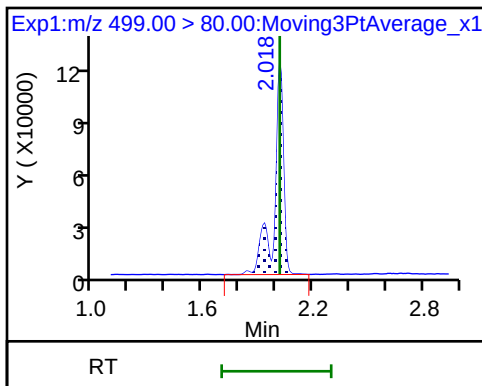
## \* 7 13C4 PFOS



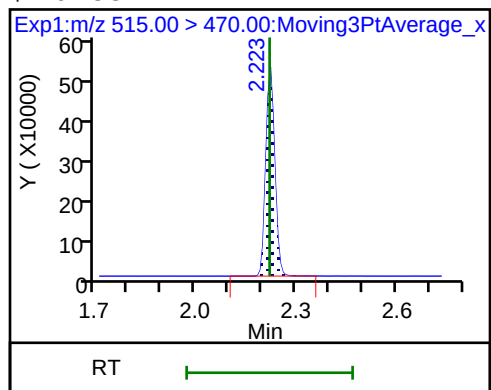
## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid

## 9 Perfluorononanoic acid



\$ 10 13C2 PFDA





TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_004.d  
 Lims ID: IC L2  
 Client ID:  
 Sample Type: IC Calib Level: 2  
 Inject. Date: 07-Aug-2018 12:48:44 ALS Bottle#: 2 Worklist Smp#: 3  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L2\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Aug-2018 13:58:31 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK014

First Level Reviewer: barnettj

Date: 07-Aug-2018 13:13:14

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N  | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |      |       |
| 298.90 > 80.00                  | 1.350 | 1.352  | -0.002 | 1.000  | 2326382  | 20.6         |                 | 3540 |       |
| 298.90 > 99.00                  | 1.350 | 1.352  | -0.002 | 1.000  | 1596933  |              | 1.46(0.00-0.00) | 2870 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |      |       |
| 315.00 > 270.00                 | 1.464 | 1.468  | -0.004 | 1.000  | 1286815  | 9.72         |                 | 9413 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |      |       |
| 399.00 > 80.00                  | 1.601 | 1.603  | -0.002 | 1.000  | 1107645  | 6.50         |                 | 1118 |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |      |       |
| 363.00 > 319.00                 | 1.601 | 1.605  | -0.004 | 1.000  | 275735   | 2.13         |                 | 72.1 |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |      |       |
| 415.00 > 370.00                 | 1.775 | 1.774  | 0.001  |        | 1204534  | 10.0         |                 | 7242 |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |      |       |
| 413.00 > 369.00                 | 1.775 | 1.775  | 0.0    | 1.000  | 554036   | 4.20         |                 | 75.8 |       |
| 413.00 > 169.00                 | 1.775 | 1.775  | 0.0    | 1.000  | 298803   |              | 1.85(0.00-0.00) | 720  |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |      |       |
| 503.00 > 80.00                  | 2.018 | 2.016  | 0.002  |        | 2739996  | 28.7         |                 | 3797 |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |      |       |
| 499.00 > 80.00                  | 2.018 | 2.018  | 0.0    | 1.000  | 878368   | 8.42         |                 | 1011 |       |
| 499.00 > 99.00                  | 2.018 | 2.018  | 0.0    | 1.000  | 188938   |              | 4.65(0.00-0.00) | 520  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |      |       |
| 463.00 > 419.00                 | 2.026 | 2.024  | 0.002  | 1.000  | 404484   | 4.26         |                 | 71.8 |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |      |       |
| 515.00 > 470.00                 | 2.223 | 2.220  | 0.003  | 1.000  | 1005796  | 10.2         |                 | 6997 |       |

**Reagents:**

LC537-L2\_00022

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_004.d

Injection Date: 07-Aug-2018 12:48:44

Instrument ID: A8\_N

Lims ID: IC L2

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 2

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

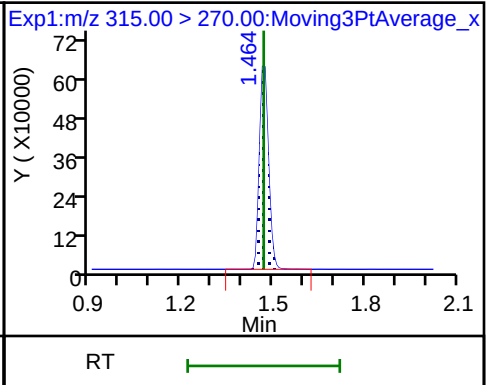
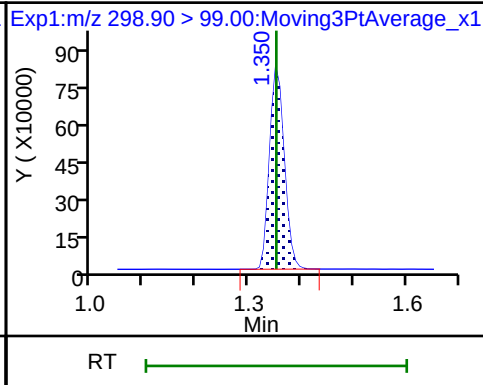
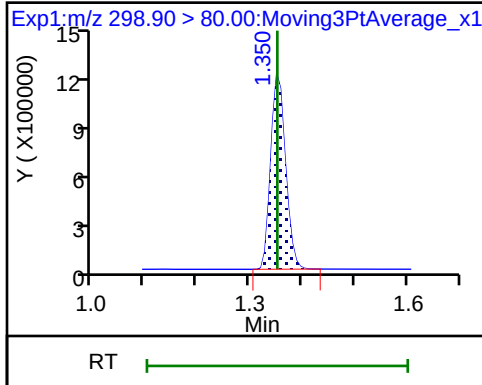
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

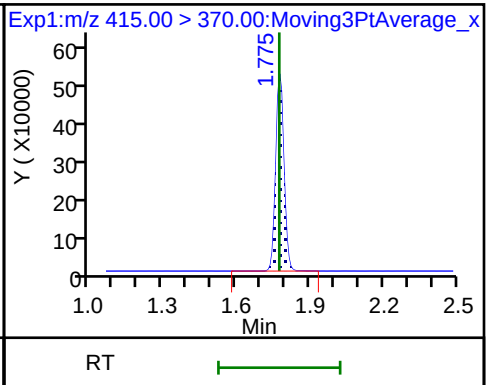
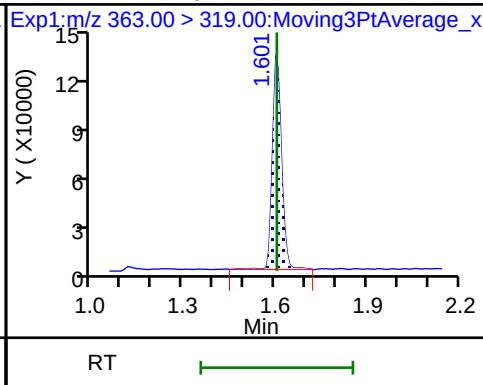
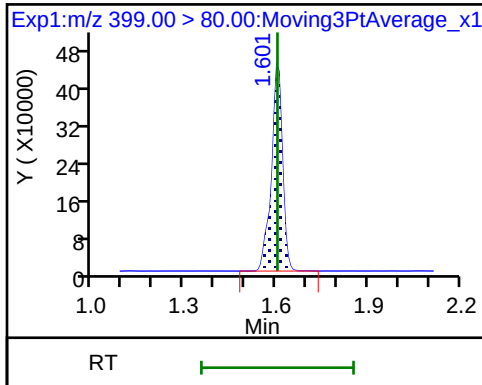
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

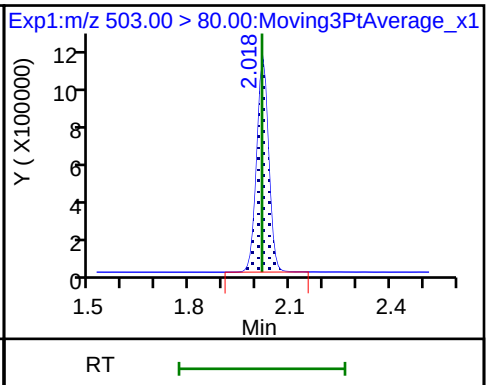
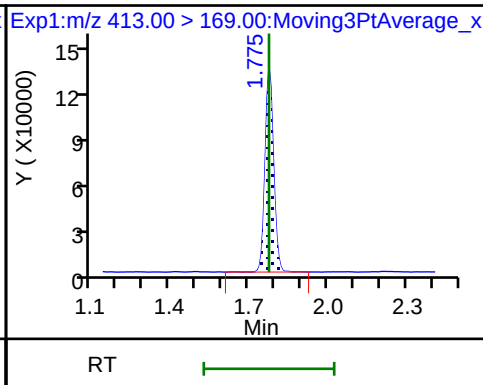
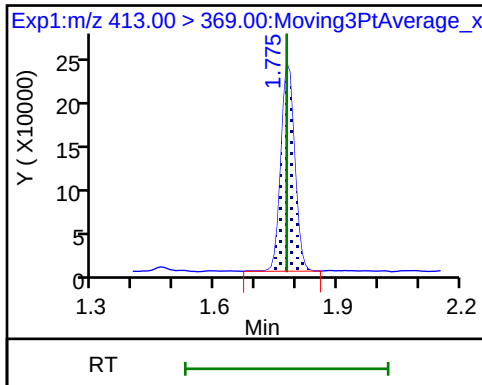
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

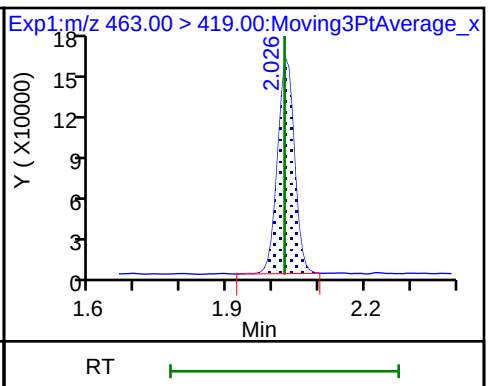
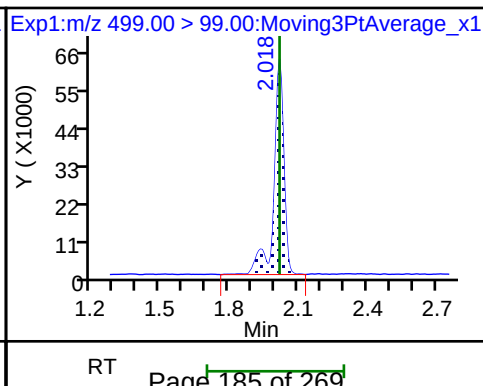
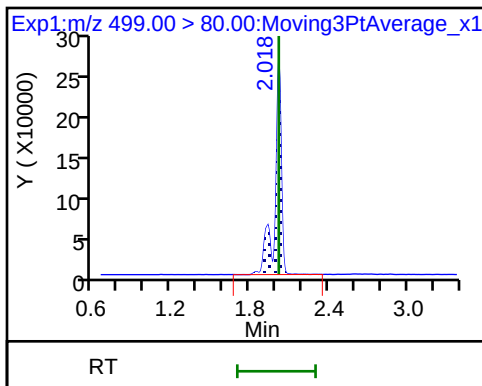
## \* 7 13C4 PFOS



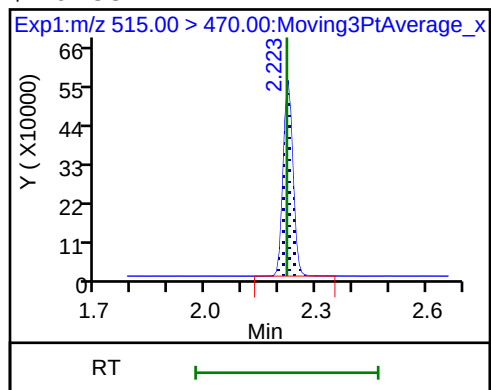
## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid

## 9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_005.d  
 Lims ID: IC L3  
 Client ID:  
 Sample Type: IC Calib Level: 3  
 Inject. Date: 07-Aug-2018 12:53:24 ALS Bottle#: 3 Worklist Smp#: 4  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L3\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Aug-2018 13:58:32 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK014

First Level Reviewer: barnettj

Date: 07-Aug-2018 13:13:00

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.350 | 1.352  | -0.002 | 1.000  | 5241287  | 48.8         |                 | 7363  |       |
| 298.90 > 99.00                  | 1.350 | 1.352  | -0.002 | 1.000  | 3626614  |              | 1.45(0.00-0.00) | 5038  |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.464 | 1.468  | -0.004 | 1.000  | 1252048  | 9.76         |                 | 11712 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.601 | 1.603  | -0.002 | 1.000  | 2450188  | 15.1         |                 | 2294  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.601 | 1.605  | -0.004 | 1.000  | 621773   | 4.95         |                 | 160   |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.775 | 1.774  | 0.001  |        | 1167019  | 10.0         |                 | 7418  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.775 | 1.775  | 0.0    | 1.000  | 1247621  | 9.76         |                 | 174   |       |
| 413.00 > 169.00                 | 1.775 | 1.775  | 0.0    | 1.000  | 660433   |              | 1.89(0.00-0.00) | 1542  |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 2.011 | 2.016  | -0.005 |        | 2601656  | 28.7         |                 | 3778  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 2.018 | 2.018  | 0.0    | 1.000  | 1982811  | 20.0         |                 | 2060  |       |
| 499.00 > 99.00                  | 2.018 | 2.018  | 0.0    | 1.000  | 423366   |              | 4.68(0.00-0.00) | 1173  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 2.026 | 2.024  | 0.002  | 1.000  | 898787   | 9.77         |                 | 159   |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.215 | 2.220  | -0.005 | 1.000  | 895349   | 9.37         |                 | 6051  |       |

**Reagents:**

LC537-L3\_00025

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_005.d

Injection Date: 07-Aug-2018 12:53:24

Instrument ID: A8\_N

Lims ID: IC L3

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 3

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

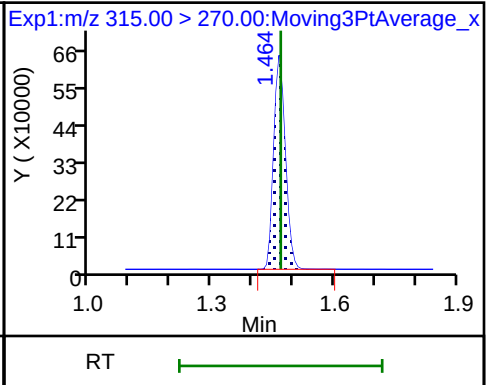
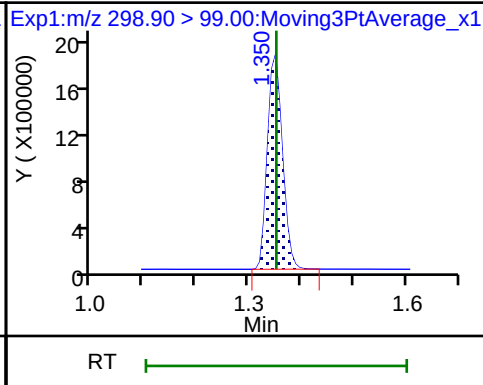
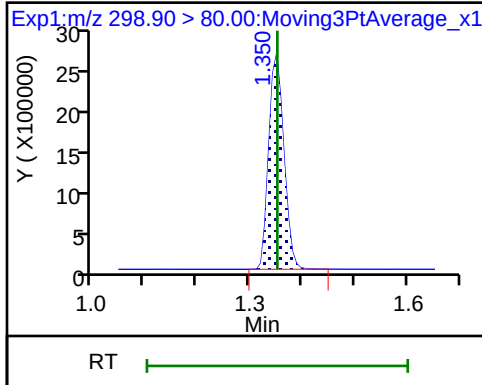
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

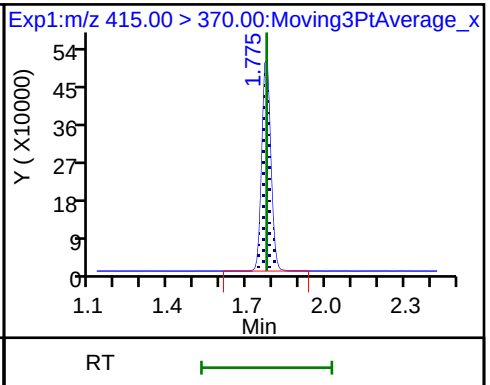
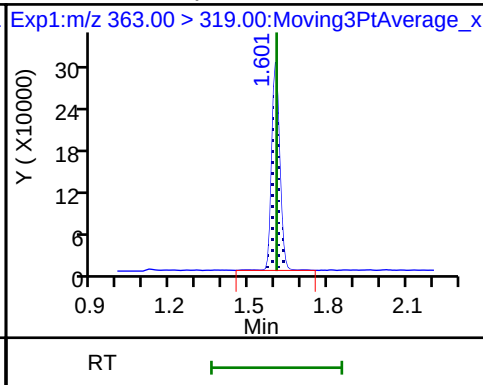
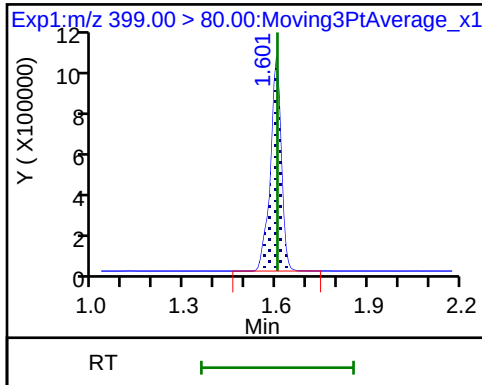
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

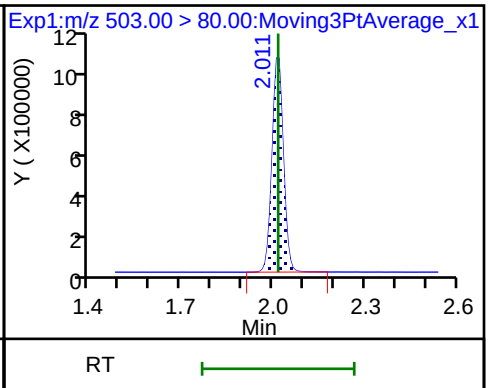
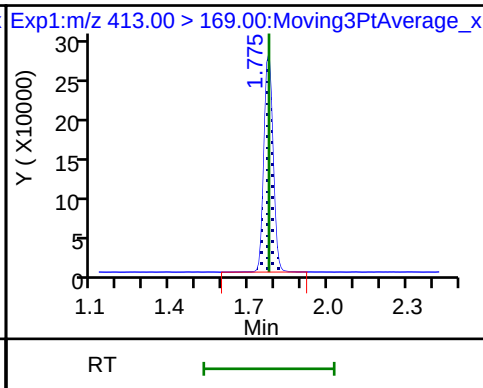
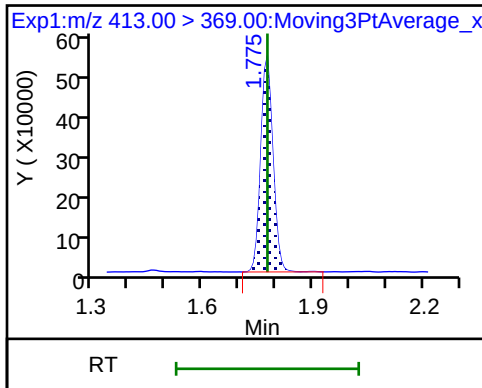
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

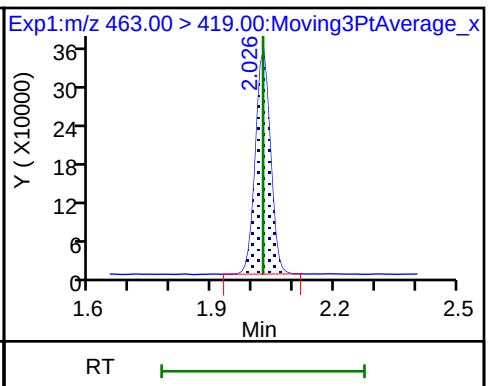
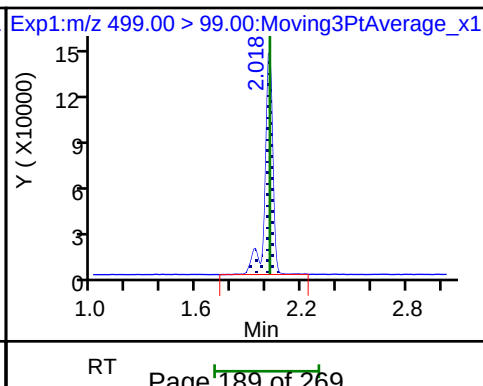
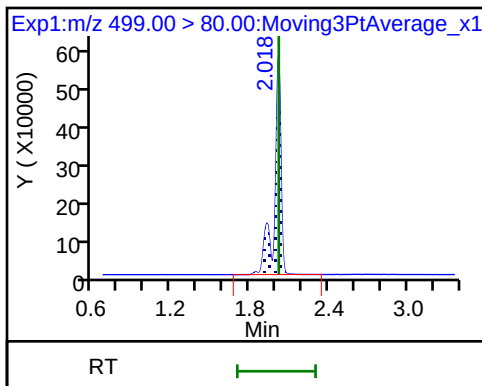
\* 7 13C4 PFOS



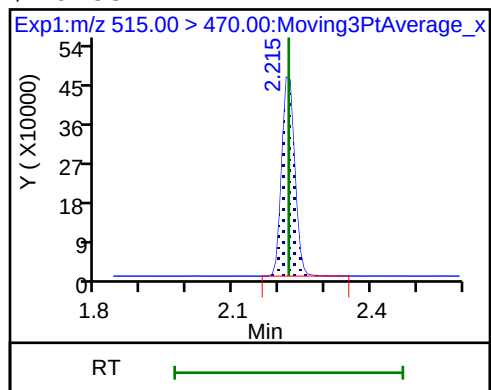
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA





TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_006.d  
 Lims ID: IC L4  
 Client ID:  
 Sample Type: ICISAV Calib Level: 4  
 Inject. Date: 07-Aug-2018 12:58:05 ALS Bottle#: 4 Worklist Smp#: 5  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L4\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Aug-2018 13:58:33 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK014

First Level Reviewer: barnettj

Date: 07-Aug-2018 13:12:46

| Signal                          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 298.90 > 80.00                  | 1.350 | 1.352     | -0.002    | 1.000     | 9203217  | 91.6            |                 | 11252 |       |
| 298.90 > 99.00                  | 1.350 | 1.352     | -0.002    | 1.000     | 6828220  |                 | 1.35(0.00-0.00) | 9534  |       |
| \$ 2 13C2 PFHxA                 |       |           |           |           |          |                 |                 |       |       |
| 315.00 > 270.00                 | 1.472 | 1.468     | 0.004     | 1.000     | 1184544  | 10.1            |                 | 8412  |       |
| 3 Perfluorohexanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 399.00 > 80.00                  | 1.608 | 1.603     | 0.005     | 1.000     | 4747515  | 31.4            |                 | 3878  |       |
| 4 Perfluoroheptanoic acid       |       |           |           |           |          |                 |                 |       |       |
| 363.00 > 319.00                 | 1.608 | 1.605     | 0.003     | 1.000     | 1128009  | 9.86            |                 | 285   |       |
| * 6 13C2-PFOA                   |       |           |           |           |          |                 |                 |       |       |
| 415.00 > 370.00                 | 1.775 | 1.774     | 0.001     |           | 1063858  | 10.0            |                 | 6639  |       |
| 5 Perfluorooctanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 413.00 > 369.00                 | 1.775 | 1.775     | 0.0       | 1.000     | 2347790  | 20.1            |                 | 325   |       |
| 413.00 > 169.00                 | 1.775 | 1.775     | 0.0       | 1.000     | 1230011  |                 | 1.91(0.00-0.00) | 2805  |       |
| * 7 13C4 PFOS                   |       |           |           |           |          |                 |                 |       |       |
| 503.00 > 80.00                  | 2.018 | 2.016     | 0.002     |           | 2433237  | 28.7            |                 | 3365  |       |
| 8 Perfluorooctane sulfonic acid |       |           |           |           |          |                 |                 |       |       |
| 499.00 > 80.00                  | 2.018 | 2.018     | 0.0       | 1.000     | 3674504  | 39.7            |                 | 3538  |       |
| 499.00 > 99.00                  | 2.018 | 2.018     | 0.0       | 1.000     | 775982   |                 | 4.74(0.00-0.00) | 1971  |       |
| 9 Perfluorononanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 463.00 > 419.00                 | 2.026 | 2.024     | 0.002     | 1.000     | 1728770  | 20.6            |                 | 300   |       |
| \$ 10 13C2 PFDA                 |       |           |           |           |          |                 |                 |       |       |
| 515.00 > 470.00                 | 2.223 | 2.220     | 0.003     | 1.000     | 905914   | 10.4            |                 | 6669  |       |

**Reagents:**

LC537-L4\_00022

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_006.d

Injection Date: 07-Aug-2018 12:58:05

Instrument ID: A8\_N

Lims ID: IC L4

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 4

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

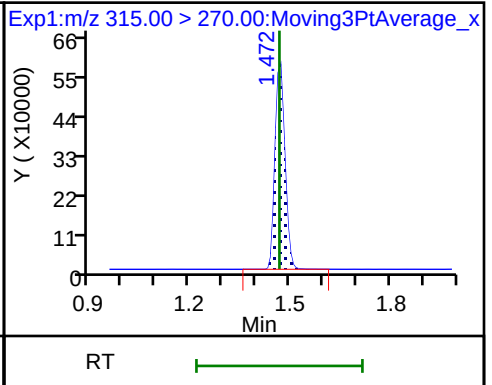
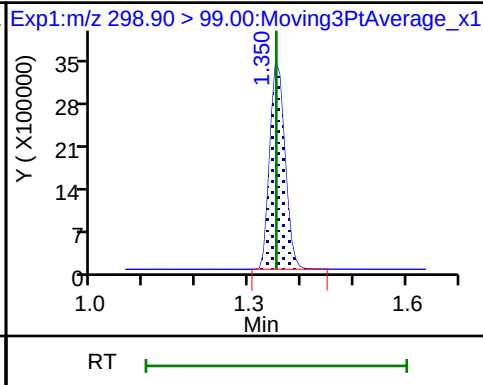
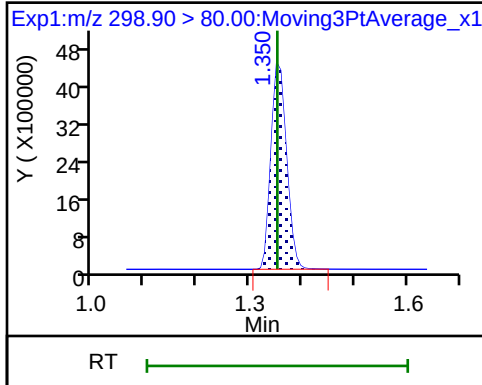
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

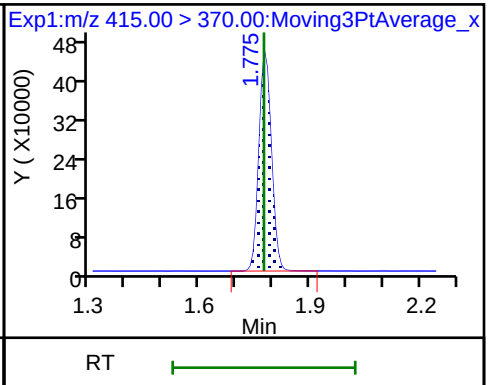
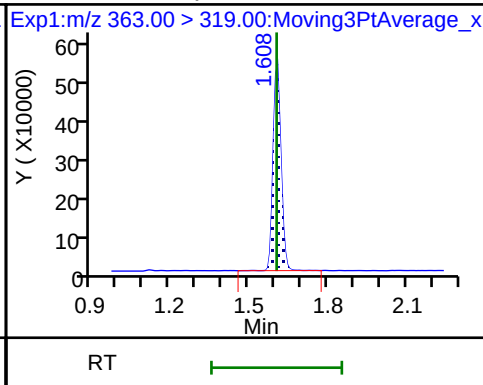
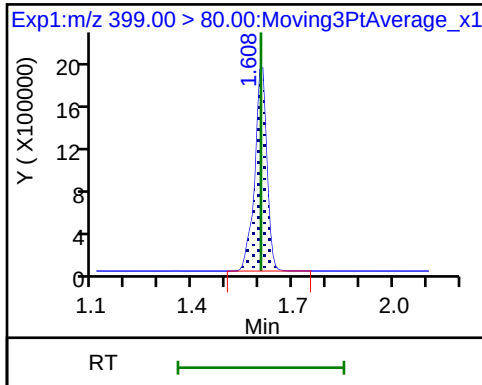
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

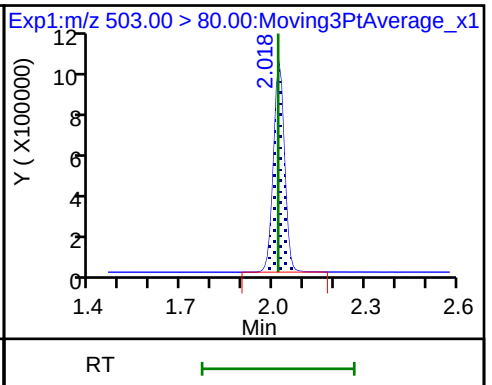
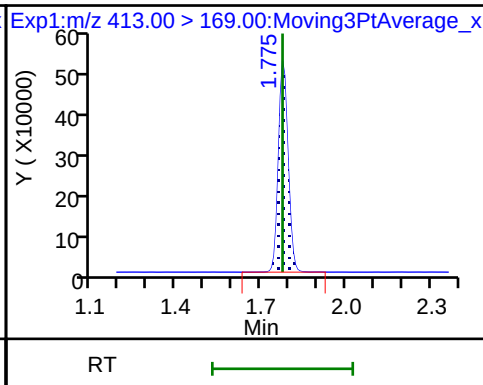
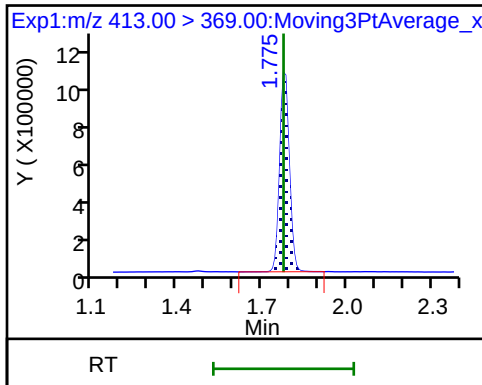
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

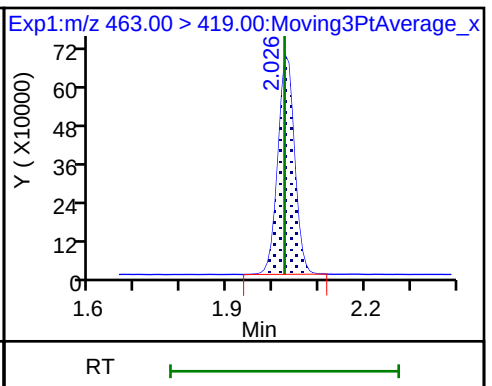
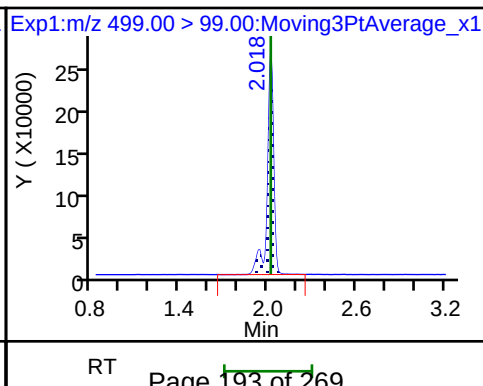
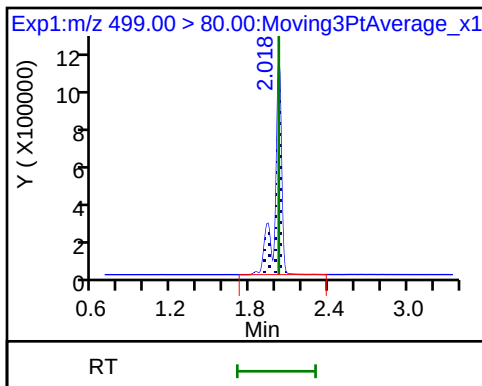
## \* 7 13C4 PFOS



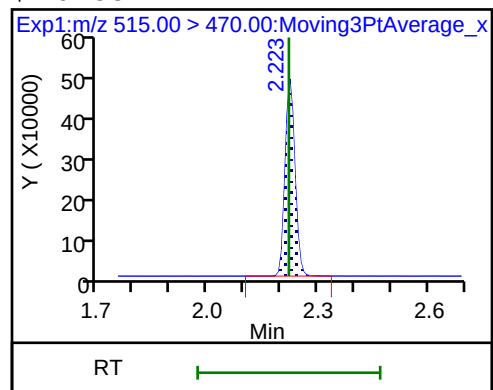
## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid

## 9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_007.d  
 Lims ID: IC L5  
 Client ID:  
 Sample Type: IC Calib Level: 5  
 Inject. Date: 07-Aug-2018 13:02:45 ALS Bottle#: 5 Worklist Smp#: 6  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L5\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Aug-2018 13:58:34 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK014

First Level Reviewer: barnettj

Date: 07-Aug-2018 13:12:31

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.358 | 1.352  | 0.006  | 1.000  | 13659010 | 127.5        |                 | 13401 |       |
| 298.90 > 99.00                  | 1.350 | 1.352  | -0.002 | 0.994  | 9948848  |              | 1.37(0.00-0.00) | 11116 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.472 | 1.468  | 0.004  | 1.000  | 1301097  | 10.0         |                 | 10713 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.608 | 1.603  | 0.005  | 1.000  | 7395512  | 45.9         |                 | 5855  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.608 | 1.605  | 0.003  | 1.000  | 1828933  | 14.4         |                 | 441   |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.775 | 1.774  | 0.001  |        | 1182103  | 10.0         |                 | 7154  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.783 | 1.775  | 0.008  | 1.000  | 3802739  | 29.4         |                 | 515   |       |
| 413.00 > 169.00                 | 1.775 | 1.775  | 0.0    | 0.996  | 1988949  |              | 1.91(0.00-0.00) | 3905  |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 2.018 | 2.016  | 0.002  |        | 2594163  | 28.7         |                 | 3633  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 2.018 | 2.018  | 0.0    | 1.000  | 6063022  | 61.4         |                 | 5018  |       |
| 499.00 > 99.00                  | 2.018 | 2.018  | 0.0    | 1.000  | 1263173  |              | 4.80(0.00-0.00) | 2809  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 2.026 | 2.024  | 0.002  | 1.000  | 2770632  | 29.7         |                 | 461   |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.223 | 2.220  | 0.003  | 1.000  | 965975   | 9.98         |                 | 7819  |       |

**Reagents:**

LC537-L5\_00026

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_007.d

Injection Date: 07-Aug-2018 13:02:45

Instrument ID: A8\_N

Lims ID: IC L5

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 5

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

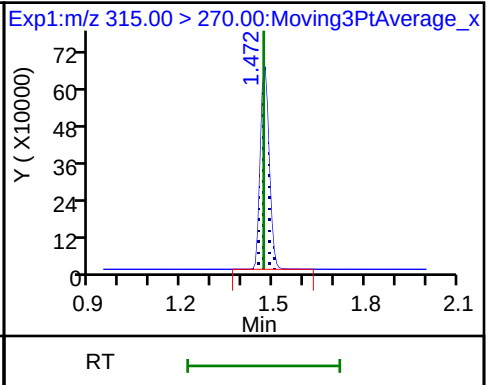
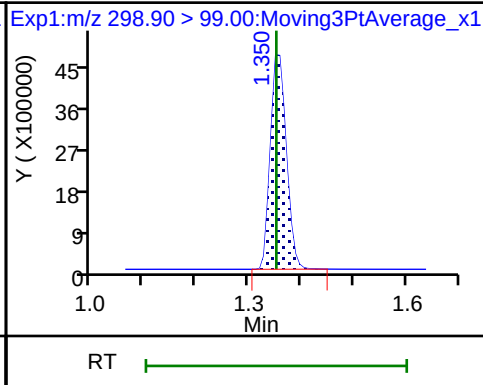
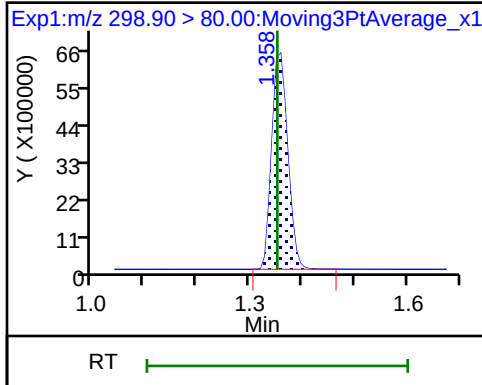
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

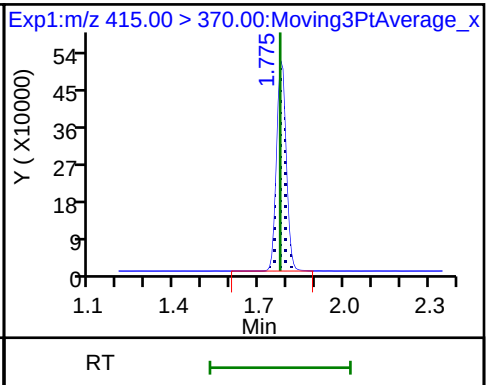
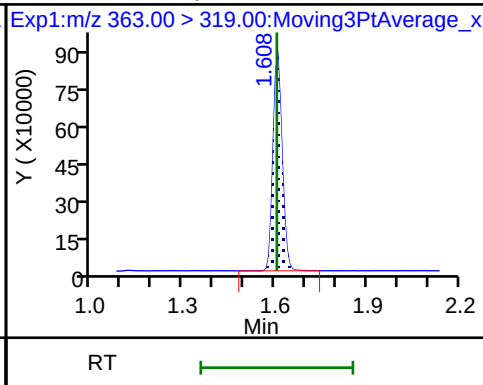
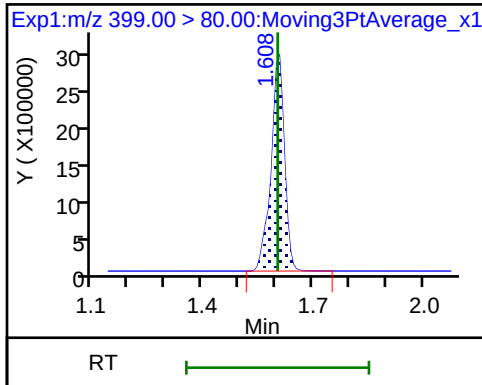
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

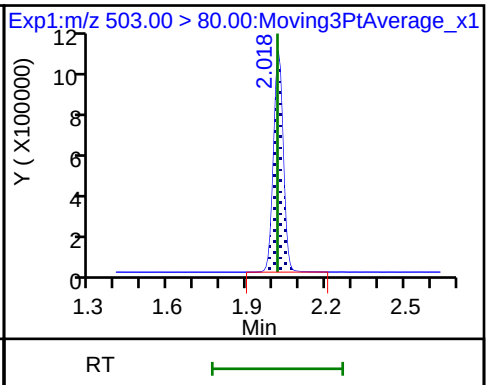
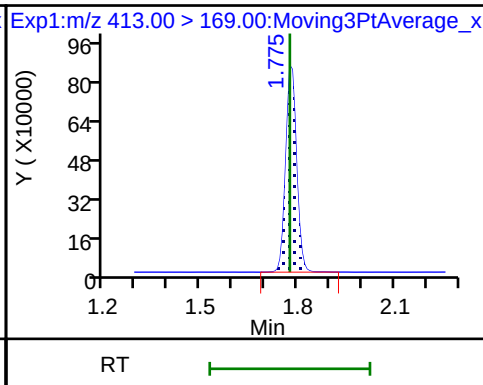
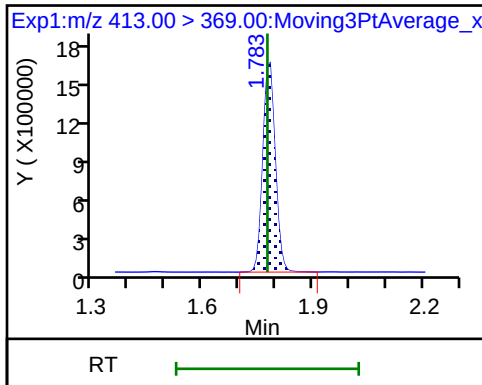
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

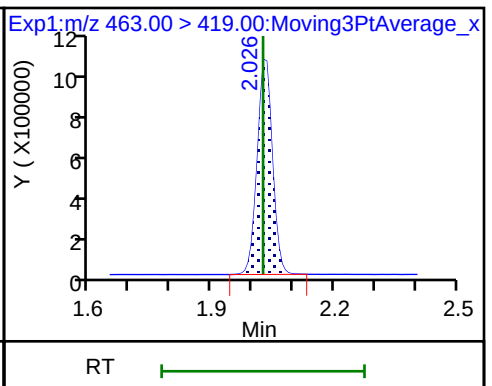
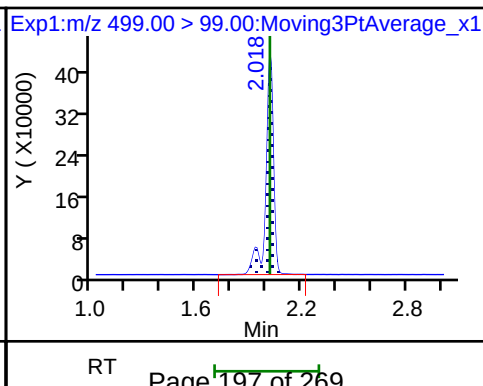
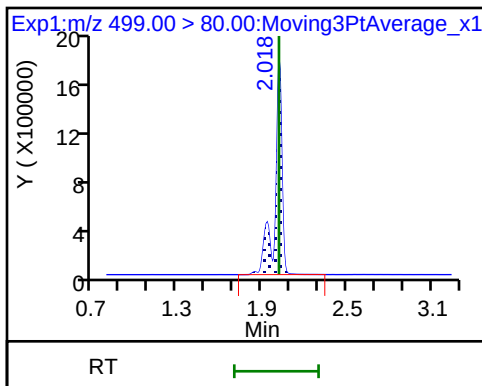
## \* 7 13C4 PFOS



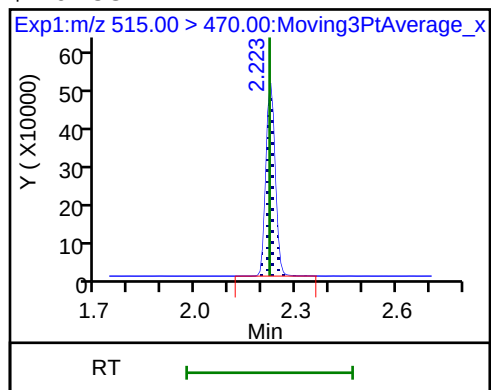
## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid

## 9 Perfluorononanoic acid



\$ 10 13C2 PFDA





TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Lims ID: IC L6  
 Client ID:  
 Sample Type: IC Calib Level: 6  
 Inject. Date: 07-Aug-2018 13:07:25 ALS Bottle#: 6 Worklist Smp#: 7  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L6\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Aug-2018 13:58:35 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK014

First Level Reviewer: barnettj

Date: 07-Aug-2018 13:17:58

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.350 | 1.352  | -0.002 | 1.000  | 16487048 | 154.4        |                 | 13956 |       |
| 298.90 > 99.00                  | 1.350 | 1.352  | -0.002 | 1.000  | 12510280 |              | 1.32(0.00-0.00) | 12516 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.464 | 1.468  | -0.004 | 1.000  | 1325342  | 10.2         |                 | 10456 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.601 | 1.603  | -0.002 | 1.000  | 9803009  | 61.0         |                 | 7313  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.601 | 1.605  | -0.004 | 1.000  | 2459664  | 19.3         |                 | 614   |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.768 | 1.774  | -0.006 |        | 1182381  | 10.0         |                 | 7425  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.768 | 1.775  | -0.007 | 1.000  | 5050799  | 39.0         |                 | 695   |       |
| 413.00 > 169.00                 | 1.768 | 1.775  | -0.007 | 1.000  | 2649100  |              | 1.91(0.00-0.00) | 5173  |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 2.011 | 2.016  | -0.005 |        | 2586897  | 28.7         |                 | 3267  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 2.011 | 2.018  | -0.007 | 1.000  | 7918924  | 80.4         |                 | 5918  |       |
| 499.00 > 99.00                  | 2.011 | 2.018  | -0.007 | 1.000  | 1707086  |              | 4.64(0.00-0.00) | 3518  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 2.018 | 2.024  | -0.006 | 1.000  | 3665889  | 39.3         |                 | 624   |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.215 | 2.220  | -0.005 | 1.000  | 978205   | 10.1         |                 | 7944  |       |

**Reagents:**

LC537-L6\_00022

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Injection Date: 07-Aug-2018 13:07:25

Instrument ID: A8\_N

Lims ID: IC L6

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 6

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

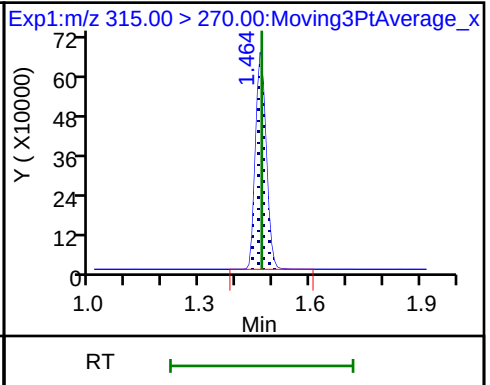
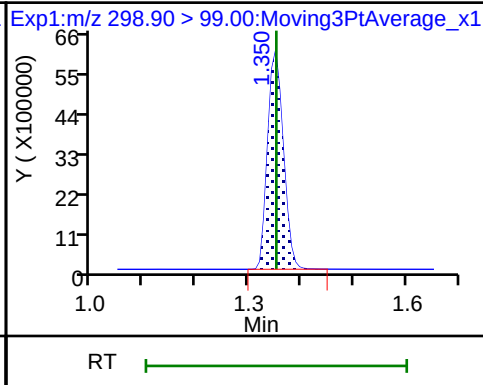
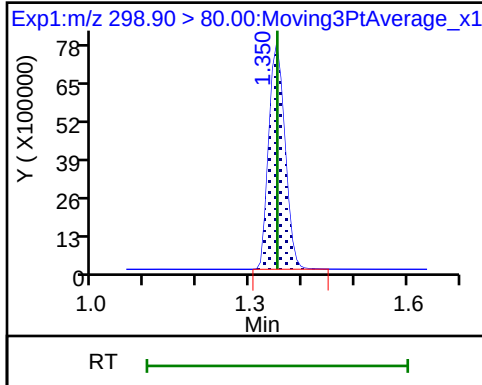
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

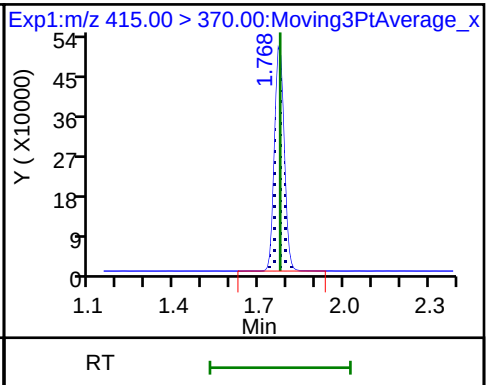
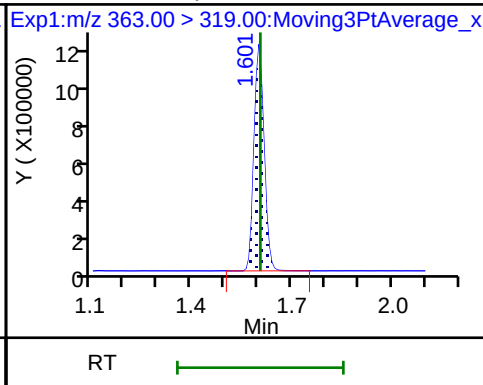
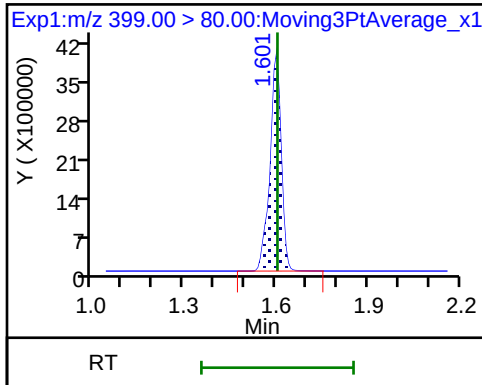
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

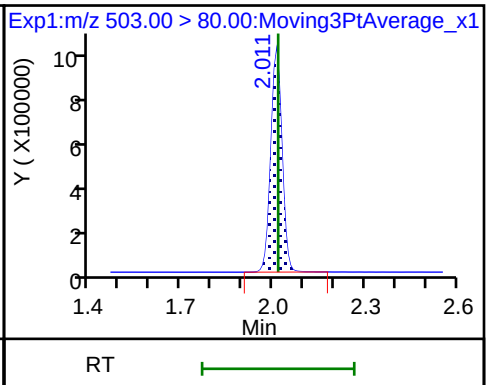
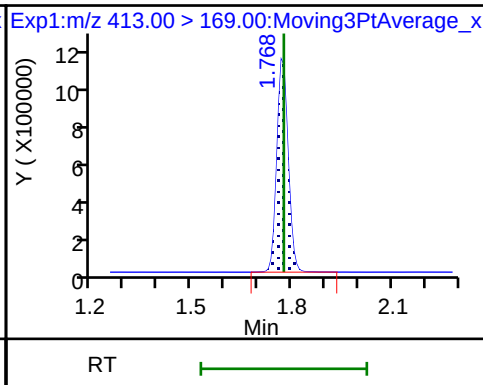
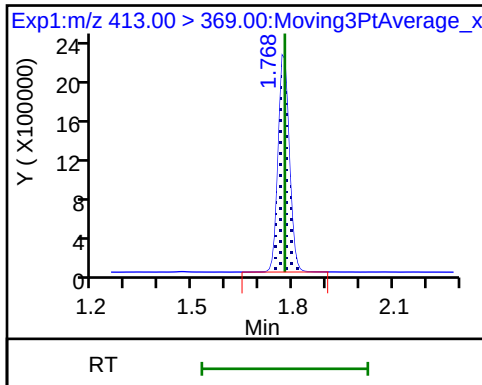
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

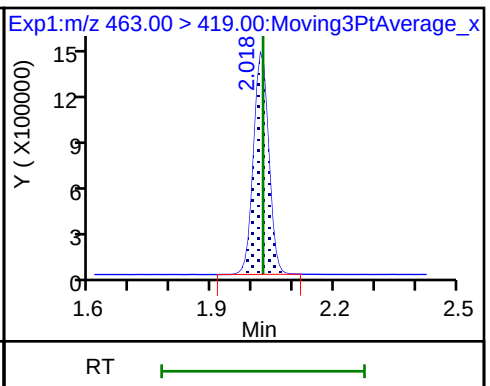
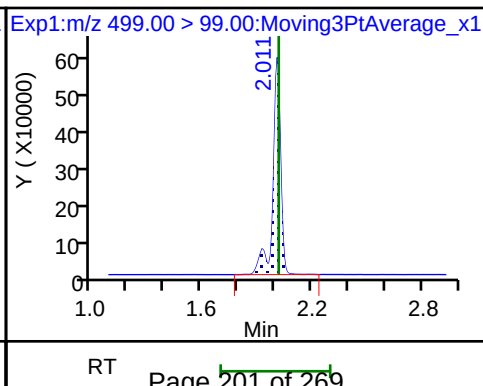
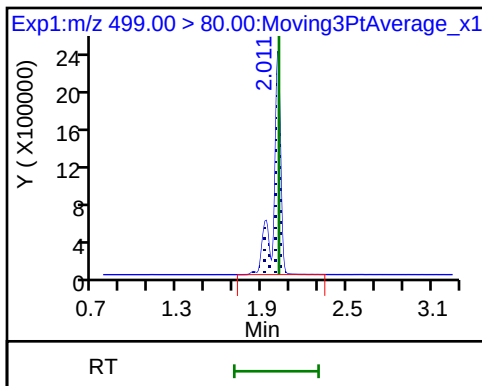
## \* 7 13C4 PFOS



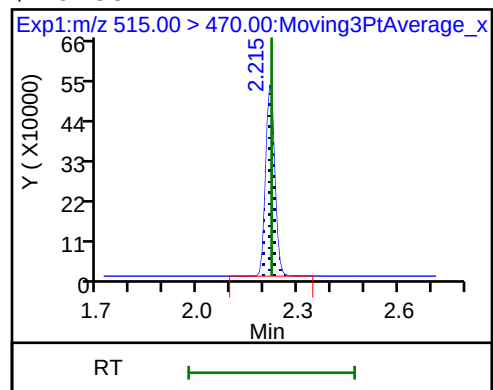
## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid

## 9 Perfluorononanoic acid



\$ 10 13C2 PFDA



## Calibration

/ Perfluorobutanesulfonic acid

Curve Type: Average  
 Weighting: Conc\_Sq  
 Origin: Force  
 Dependency: Response  
 Calib Mode: ISTD  
 Response Base: AREA  
 RF Rounding: 0

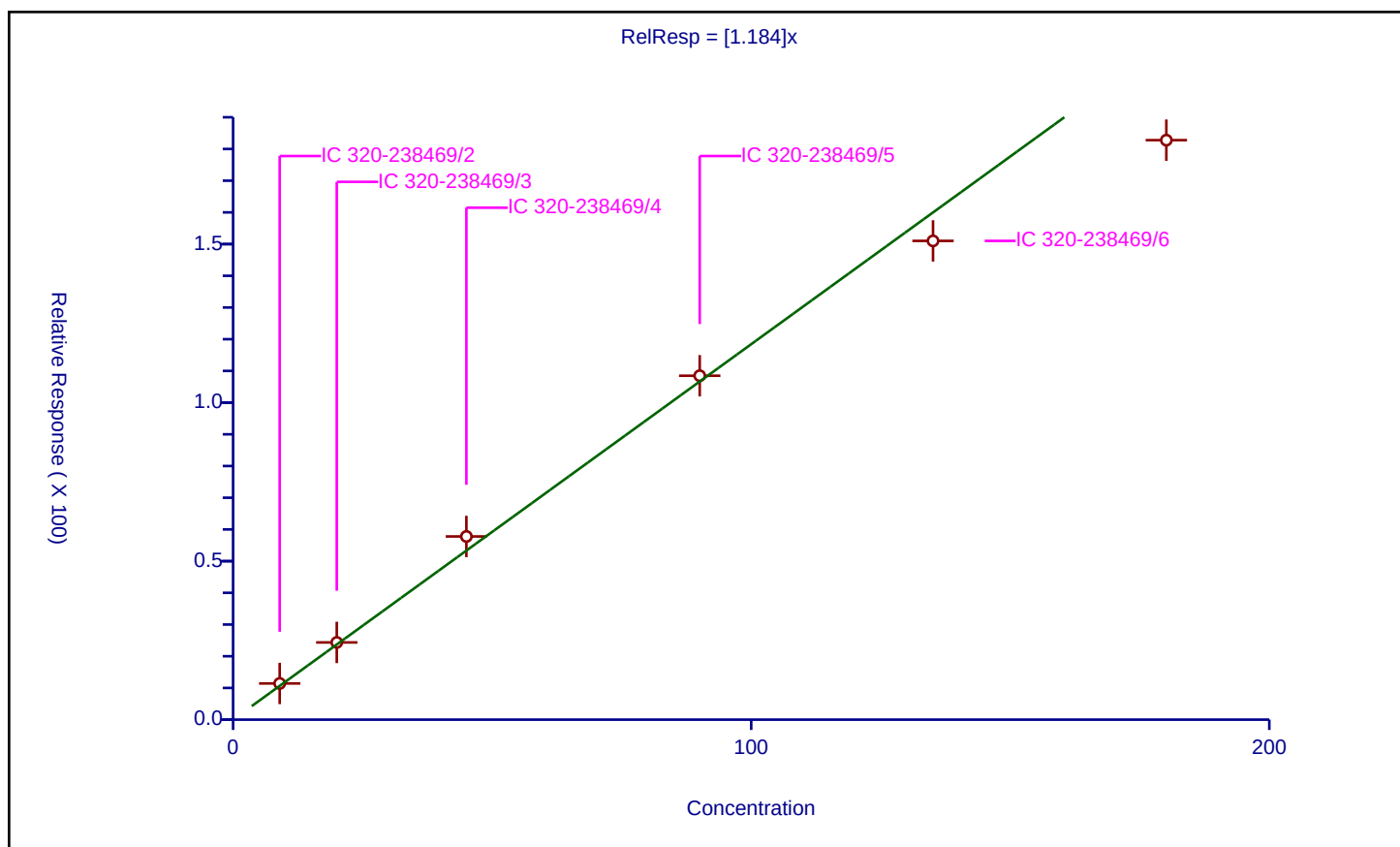
### Curve Coefficients

Intercept: 0  
 Slope: 1.184

### Error Coefficients

Standard Error: 10700000  
 Relative Standard Error: 8.6  
 Correlation Coefficient: 0.993  
 Coefficient of Determination (Adjusted): 0.988

| ID | Level           | Concentration | Rel. Resp. | IS Amount | IS Response | RRF      | Used |
|----|-----------------|---------------|------------|-----------|-------------|----------|------|
| 1  | IC 320-238469/2 | 8.99912       | 11.415125  | 28.68     | 2748260.0   | 1.268471 | Y    |
| 2  | IC 320-238469/3 | 20.01376      | 24.350633  | 28.68     | 2739996.0   | 1.216695 | Y    |
| 3  | IC 320-238469/4 | 45.03096      | 57.778627  | 28.68     | 2601656.0   | 1.283087 | Y    |
| 4  | IC 320-238469/5 | 90.06192      | 108.476184 | 28.68     | 2433237.0   | 1.204462 | Y    |
| 5  | IC 320-238469/6 | 135.09288     | 151.008401 | 28.68     | 2594163.0   | 1.117812 | Y    |
| 6  | IC 320-238469/7 | 180.12384     | 182.785993 | 28.68     | 2586897.0   | 1.01478  | Y    |



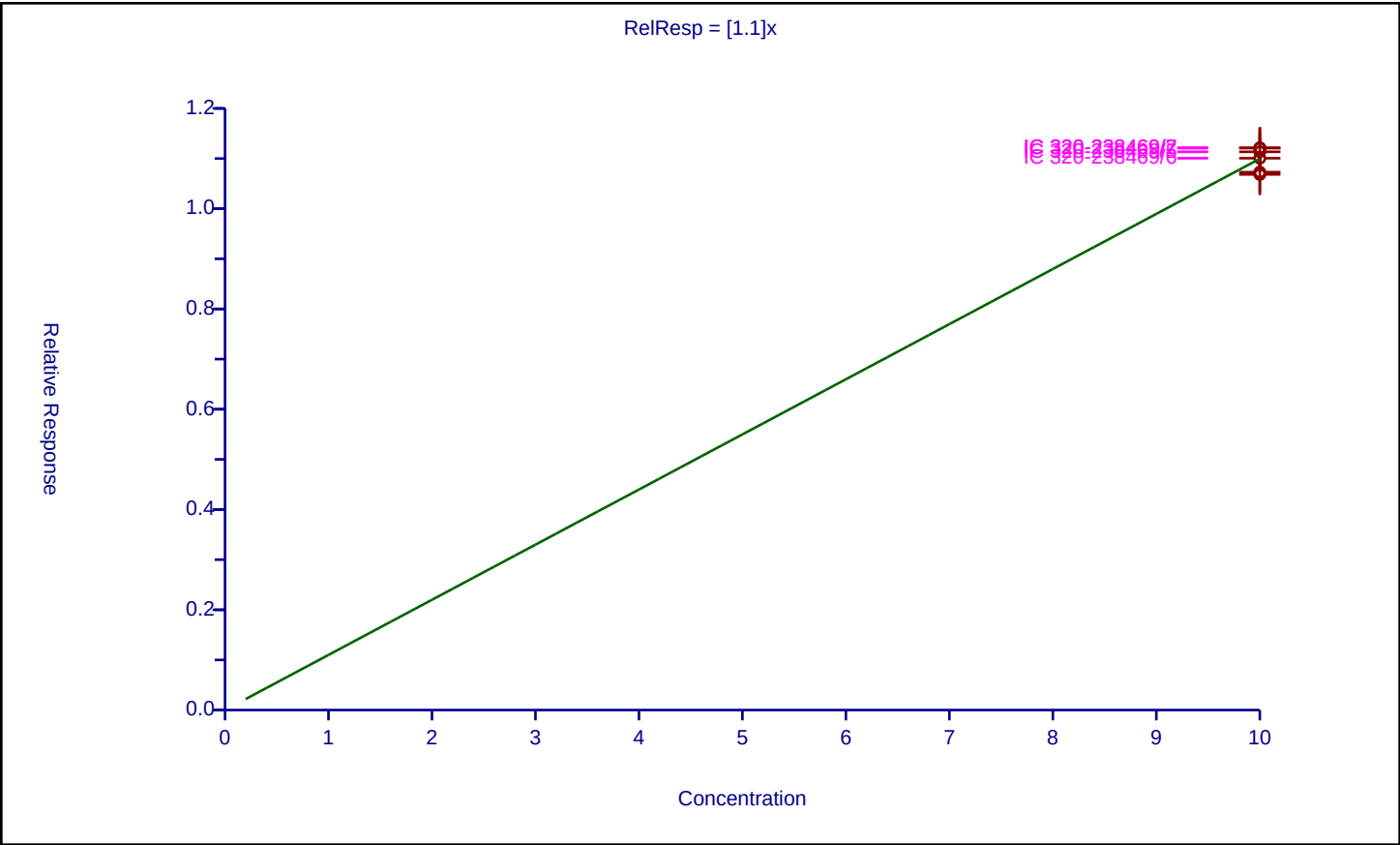
Calibration

/ 13C2 PFHxA

Curve Type: Average  
Weighting: Conc\_Sq  
Origin: Force  
Dependency: Response  
Calib Mode: ISTD  
Response Base: AREA  
RF Rounding: 0

| Curve Coefficients                       |         |
|------------------------------------------|---------|
| Intercept:                               | 0       |
| Slope:                                   | 1.1     |
| Error Coefficients                       |         |
| Standard Error:                          | 1410000 |
| Relative Standard Error:                 | 2.2     |
| Correlation Coefficient:                 | NA      |
| Coefficient of Determination (Adjusted): | 0       |

| ID | Level           | Concentration | Rel. Resp. | IS Amount | IS Response | RRF      | Used |
|----|-----------------|---------------|------------|-----------|-------------|----------|------|
| 1  | IC 320-238469/2 | 10.0          | 11.214758  | 10.0      | 1196979.0   | 1.121476 | Y    |
| 2  | IC 320-238469/3 | 10.0          | 10.683094  | 10.0      | 1204534.0   | 1.068309 | Y    |
| 3  | IC 320-238469/4 | 10.0          | 10.7286    | 10.0      | 1167019.0   | 1.07286  | Y    |
| 4  | IC 320-238469/5 | 10.0          | 11.134418  | 10.0      | 1063858.0   | 1.113442 | Y    |
| 5  | IC 320-238469/6 | 10.0          | 11.00663   | 10.0      | 1182103.0   | 1.100663 | Y    |
| 6  | IC 320-238469/7 | 10.0          | 11.209094  | 10.0      | 1182381.0   | 1.120909 | Y    |



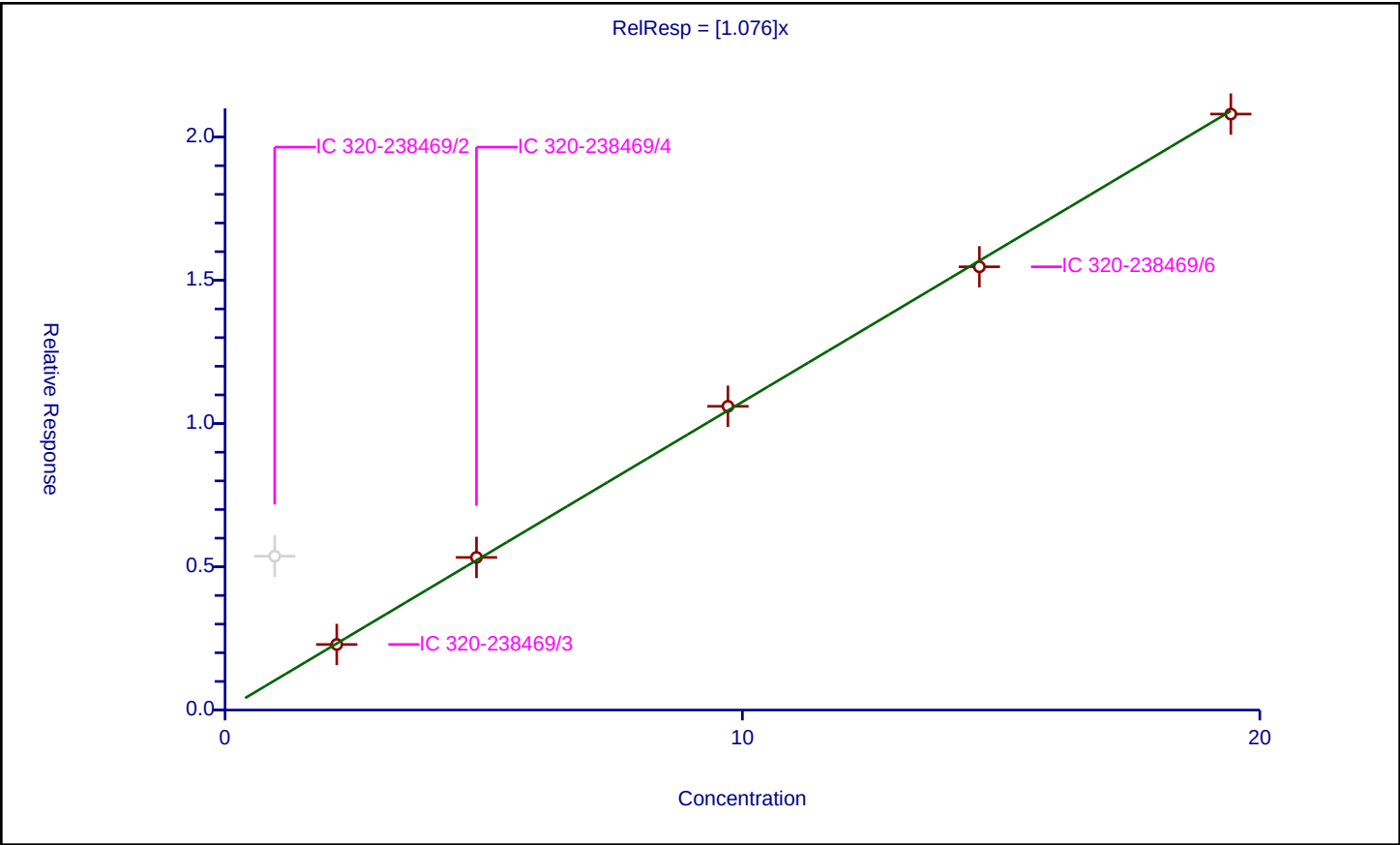
Calibration

/ Perfluoroheptanoic acid

Curve Type: Average  
Weighting: Conc\_Sq  
Origin: Force  
Dependency: Response  
Calib Mode: ISTD  
Response Base: AREA  
RF Rounding: 0

| Curve Coefficients                       |         |
|------------------------------------------|---------|
| Intercept:                               | 0       |
| Slope:                                   | 1.076   |
| Error Coefficients                       |         |
| Standard Error:                          | 1670000 |
| Relative Standard Error:                 | 1.6     |
| Correlation Coefficient:                 | 0.997   |
| Coefficient of Determination (Adjusted): | 1.000   |

| ID | Level           | Concentration | Rel. Resp. | IS Amount | IS Response | RRF      | Used |
|----|-----------------|---------------|------------|-----------|-------------|----------|------|
| 1  | IC 320-238469/2 | 0.96          | 5.372826   | 10.0      | 1196979.0   | 5.596694 | N    |
| 2  | IC 320-238469/3 | 2.16          | 2.289143   | 10.0      | 1204534.0   | 1.059788 | Y    |
| 3  | IC 320-238469/4 | 4.86          | 5.327874   | 10.0      | 1167019.0   | 1.09627  | Y    |
| 4  | IC 320-238469/5 | 9.72          | 10.603003  | 10.0      | 1063858.0   | 1.090844 | Y    |
| 5  | IC 320-238469/6 | 14.58         | 15.471858  | 10.0      | 1182103.0   | 1.06117  | Y    |
| 6  | IC 320-238469/7 | 19.44         | 20.802635  | 10.0      | 1182381.0   | 1.070094 | Y    |



## Calibration

/ Perfluorohexanesulfonic acid

**Curve Type:** Average  
**Weighting:** Conc\_Sq  
**Origin:** Force  
**Dependency:** Response  
**Calib Mode:** ISTD  
**Response Base:** AREA  
**RF Rounding:** 0

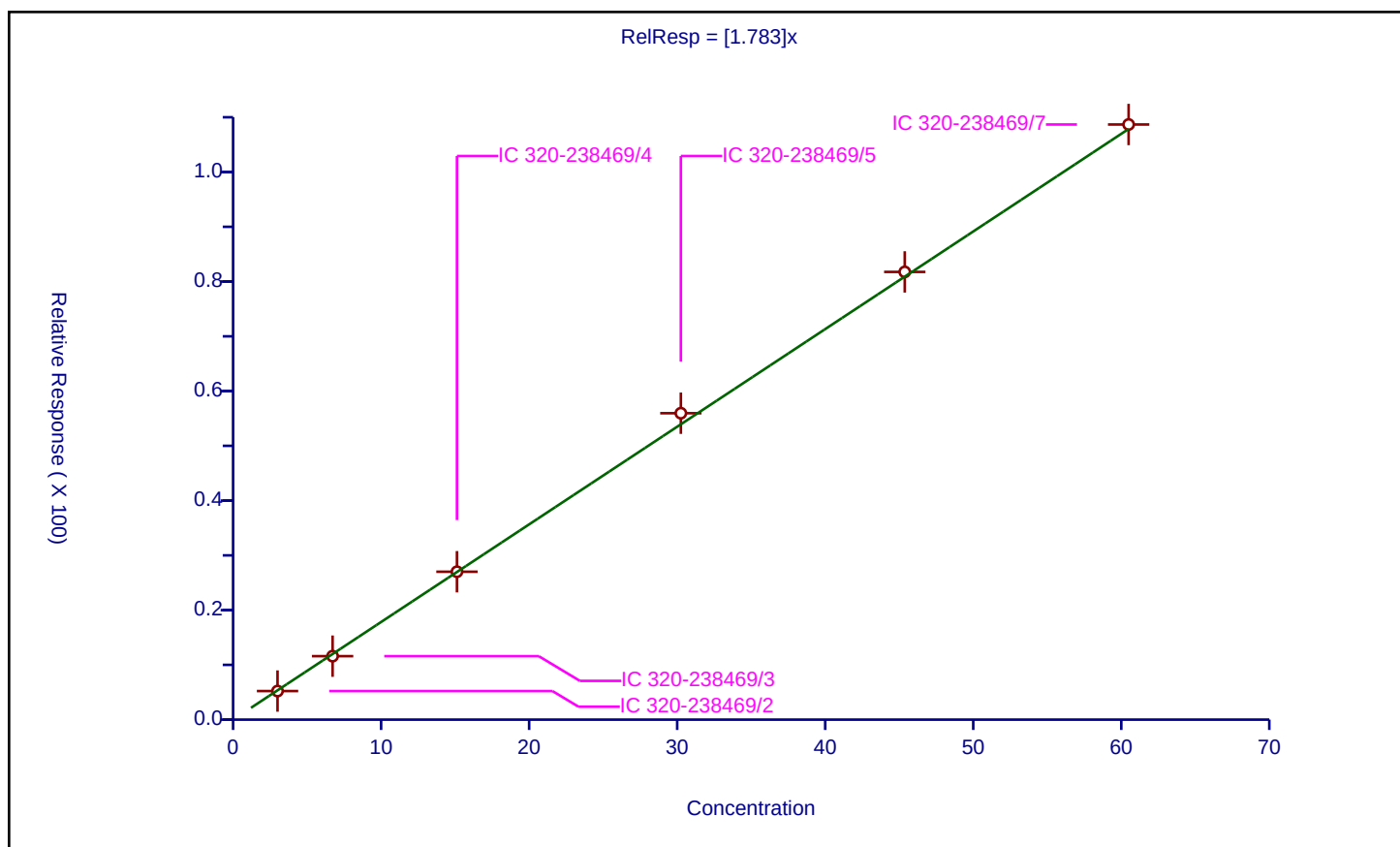
### Curve Coefficients

**Intercept:** 0  
**Slope:** 1.783

### Error Coefficients

**Standard Error:** 6010000  
**Relative Standard Error:** 2.6  
**Correlation Coefficient:** 1.000  
**Coefficient of Determination (Adjusted):** 0.999

| ID | Level           | Concentration | Rel. Resp. | IS Amount | IS Response | RRF      | Used |
|----|-----------------|---------------|------------|-----------|-------------|----------|------|
| 1  | IC 320-238469/2 | 3.003         | 5.221124   | 28.68     | 2748260.0   | 1.738636 | Y    |
| 2  | IC 320-238469/3 | 6.721867      | 11.593907  | 28.68     | 2739996.0   | 1.724805 | Y    |
| 3  | IC 320-238469/4 | 15.1242       | 27.010255  | 28.68     | 2601656.0   | 1.785896 | Y    |
| 4  | IC 320-238469/5 | 30.2484       | 55.957858  | 28.68     | 2433237.0   | 1.849944 | Y    |
| 5  | IC 320-238469/6 | 45.3726       | 81.761741  | 28.68     | 2594163.0   | 1.802007 | Y    |
| 6  | IC 320-238469/7 | 60.4968       | 108.682448 | 28.68     | 2586897.0   | 1.796499 | Y    |





## Calibration

/ Perfluorooctanoic acid

**Curve Type:** Average  
**Weighting:** Conc\_Sq  
**Origin:** Force  
**Dependency:** Response  
**Calib Mode:** ISTD  
**Response Base:** AREA  
**RF Rounding:** 0

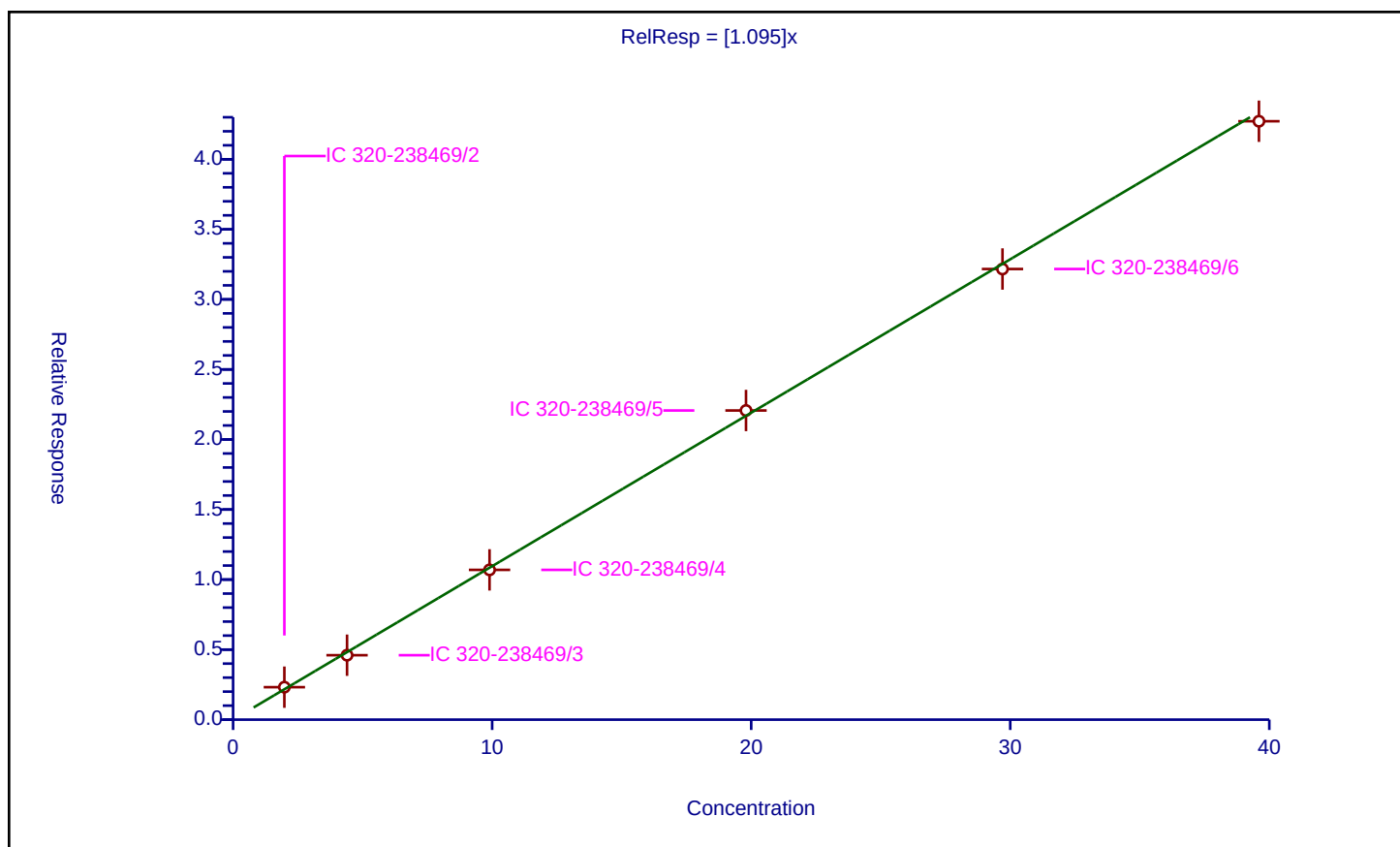
### Curve Coefficients

**Intercept:** 0  
**Slope:** 1.095

### Error Coefficients

**Standard Error:** 3080000  
**Relative Standard Error:** 3.9  
**Correlation Coefficient:** 0.998  
**Coefficient of Determination (Adjusted):** 0.998

| ID | Level           | Concentration | Rel. Resp. | IS Amount | IS Response | RRF      | Used |
|----|-----------------|---------------|------------|-----------|-------------|----------|------|
| 1  | IC 320-238469/2 | 1.98          | 2.318203   | 10.0      | 1196979.0   | 1.170809 | Y    |
| 2  | IC 320-238469/3 | 4.4           | 4.599588   | 10.0      | 1204534.0   | 1.045361 | Y    |
| 3  | IC 320-238469/4 | 9.9           | 10.690666  | 10.0      | 1167019.0   | 1.079865 | Y    |
| 4  | IC 320-238469/5 | 19.8          | 22.068641  | 10.0      | 1063858.0   | 1.114578 | Y    |
| 5  | IC 320-238469/6 | 29.7          | 32.16927   | 10.0      | 1182103.0   | 1.08314  | Y    |
| 6  | IC 320-238469/7 | 39.6          | 42.717187  | 10.0      | 1182381.0   | 1.078717 | Y    |



## Calibration

/ Perfluorooctane sulfonic acid

Curve Type: Average  
 Weighting: Conc\_Sq  
 Origin: Force  
 Dependency: Response  
 Calib Mode: ISTD  
 Response Base: AREA  
 RF Rounding: 0

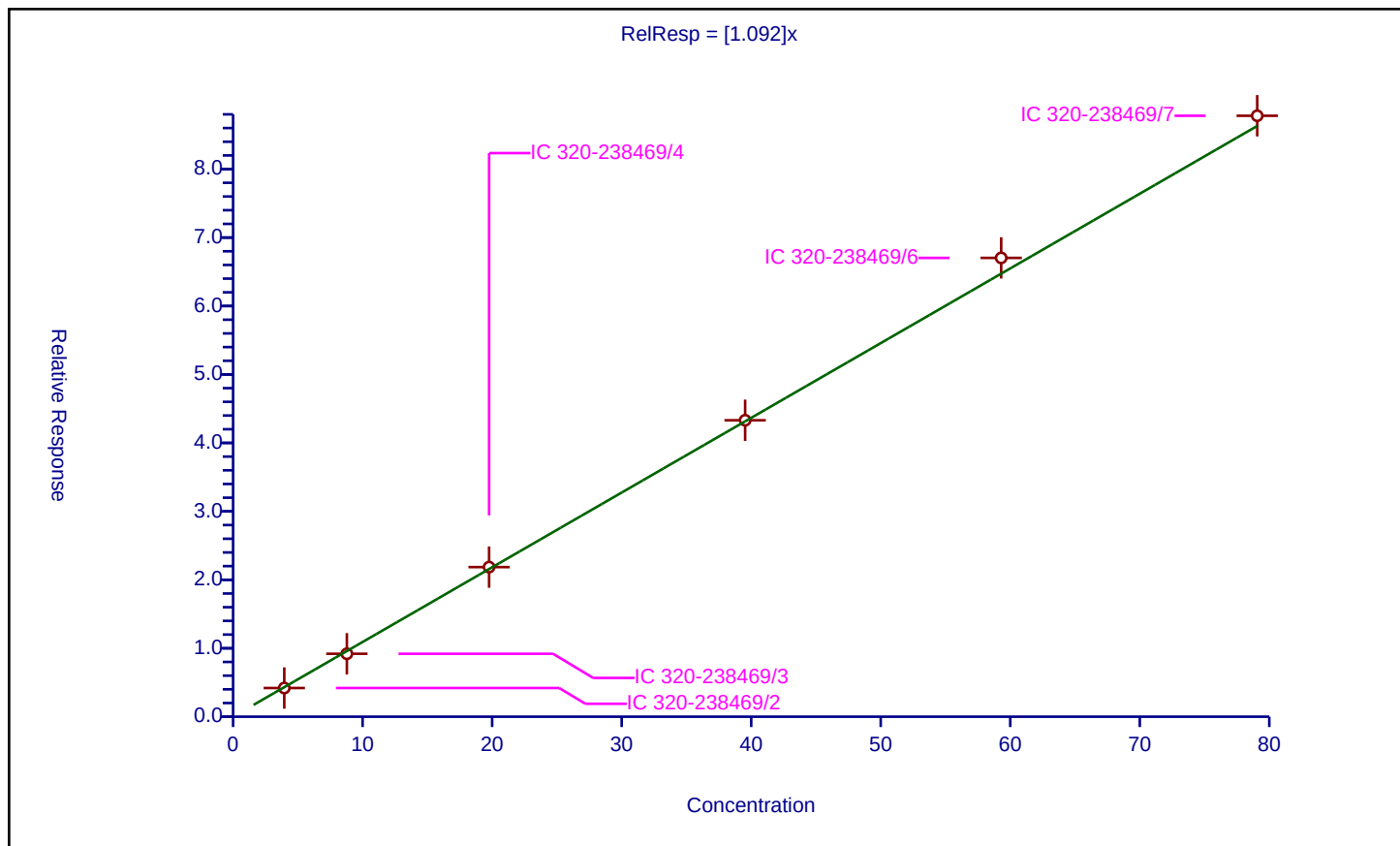
### Curve Coefficients

Intercept: 0  
 Slope: 1.092

### Error Coefficients

Standard Error: 4850000  
 Relative Standard Error: 2.9  
 Correlation Coefficient: 0.998  
 Coefficient of Determination (Adjusted): 0.999

| ID | Level           | Concentration | Rel. Resp. | IS Amount | IS Response | RRF      | Used |
|----|-----------------|---------------|------------|-----------|-------------|----------|------|
| 1  | IC 320-238469/2 | 3.95328       | 4.192613   | 28.68     | 2748260.0   | 1.06054  | Y    |
| 2  | IC 320-238469/3 | 8.785067      | 9.194026   | 28.68     | 2739996.0   | 1.046552 | Y    |
| 3  | IC 320-238469/4 | 19.7664       | 21.858009  | 28.68     | 2601656.0   | 1.105816 | Y    |
| 4  | IC 320-238469/5 | 39.5328       | 43.310526  | 28.68     | 2433237.0   | 1.095559 | Y    |
| 5  | IC 320-238469/6 | 59.2992       | 67.03028   | 28.68     | 2594163.0   | 1.130374 | Y    |
| 6  | IC 320-238469/7 | 79.0656       | 87.794273  | 28.68     | 2586897.0   | 1.110398 | Y    |



## Calibration

/ Perfluorononanoic acid

Curve Type: Average  
 Weighting: Conc\_Sq  
 Origin: Force  
 Dependency: Response  
 Calib Mode: ISTD  
 Response Base: AREA  
 RF Rounding: 0

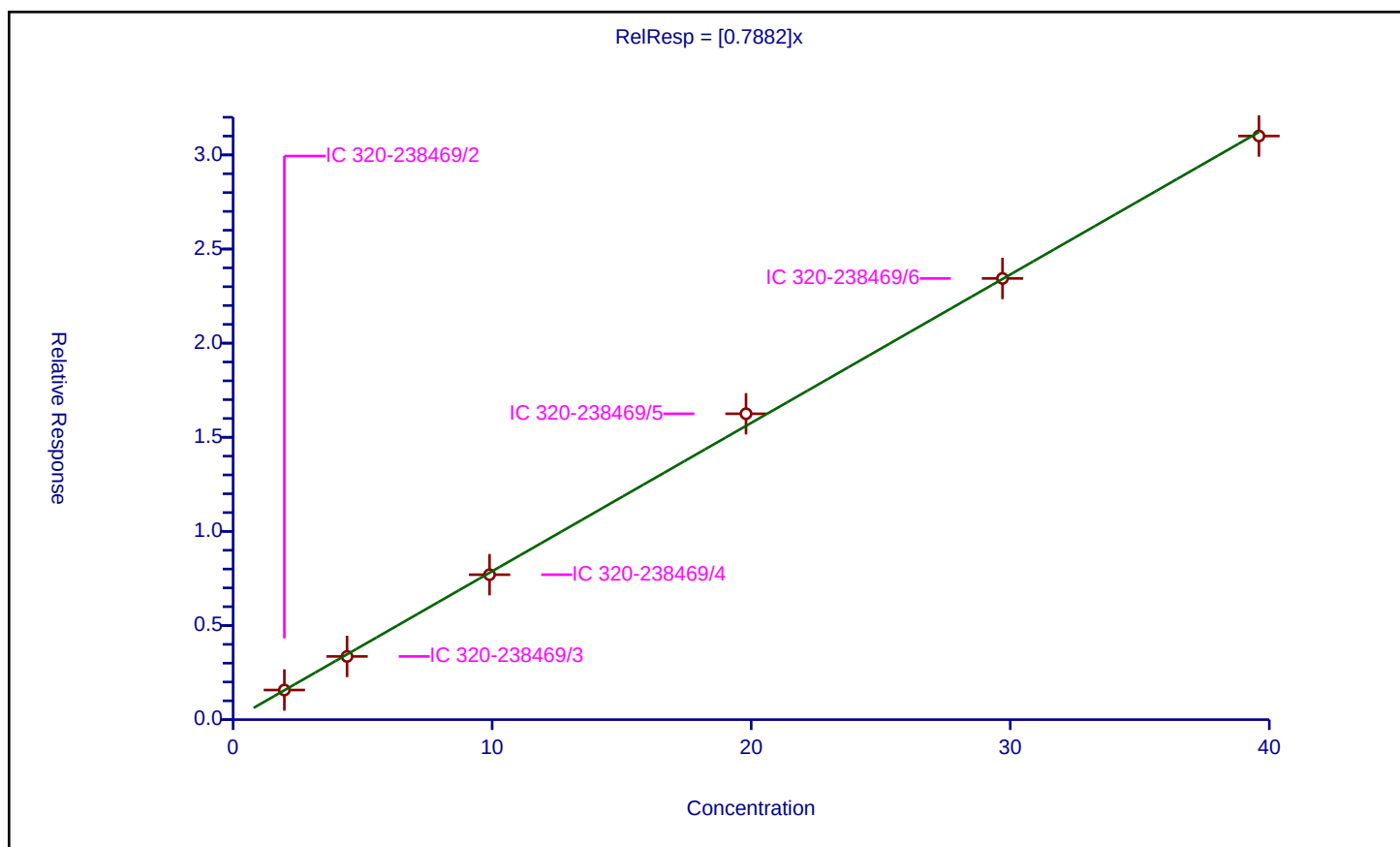
### Curve Coefficients

Intercept: 0  
 Slope: 0.7882

### Error Coefficients

Standard Error: 2240000  
 Relative Standard Error: 2.5  
 Correlation Coefficient: 0.999  
 Coefficient of Determination (Adjusted): 0.999

| ID | Level           | Concentration | Rel. Resp. | IS Amount | IS Response | RRF      | Used |
|----|-----------------|---------------|------------|-----------|-------------|----------|------|
| 1  | IC 320-238469/2 | 1.98          | 1.574464   | 10.0      | 1196979.0   | 0.795184 | Y    |
| 2  | IC 320-238469/3 | 4.4           | 3.358012   | 10.0      | 1204534.0   | 0.763185 | Y    |
| 3  | IC 320-238469/4 | 9.9           | 7.701563   | 10.0      | 1167019.0   | 0.777936 | Y    |
| 4  | IC 320-238469/5 | 19.8          | 16.250007  | 10.0      | 1063858.0   | 0.820707 | Y    |
| 5  | IC 320-238469/6 | 29.7          | 23.438161  | 10.0      | 1182103.0   | 0.789164 | Y    |
| 6  | IC 320-238469/7 | 39.6          | 31.004296  | 10.0      | 1182381.0   | 0.782937 | Y    |



Calibration

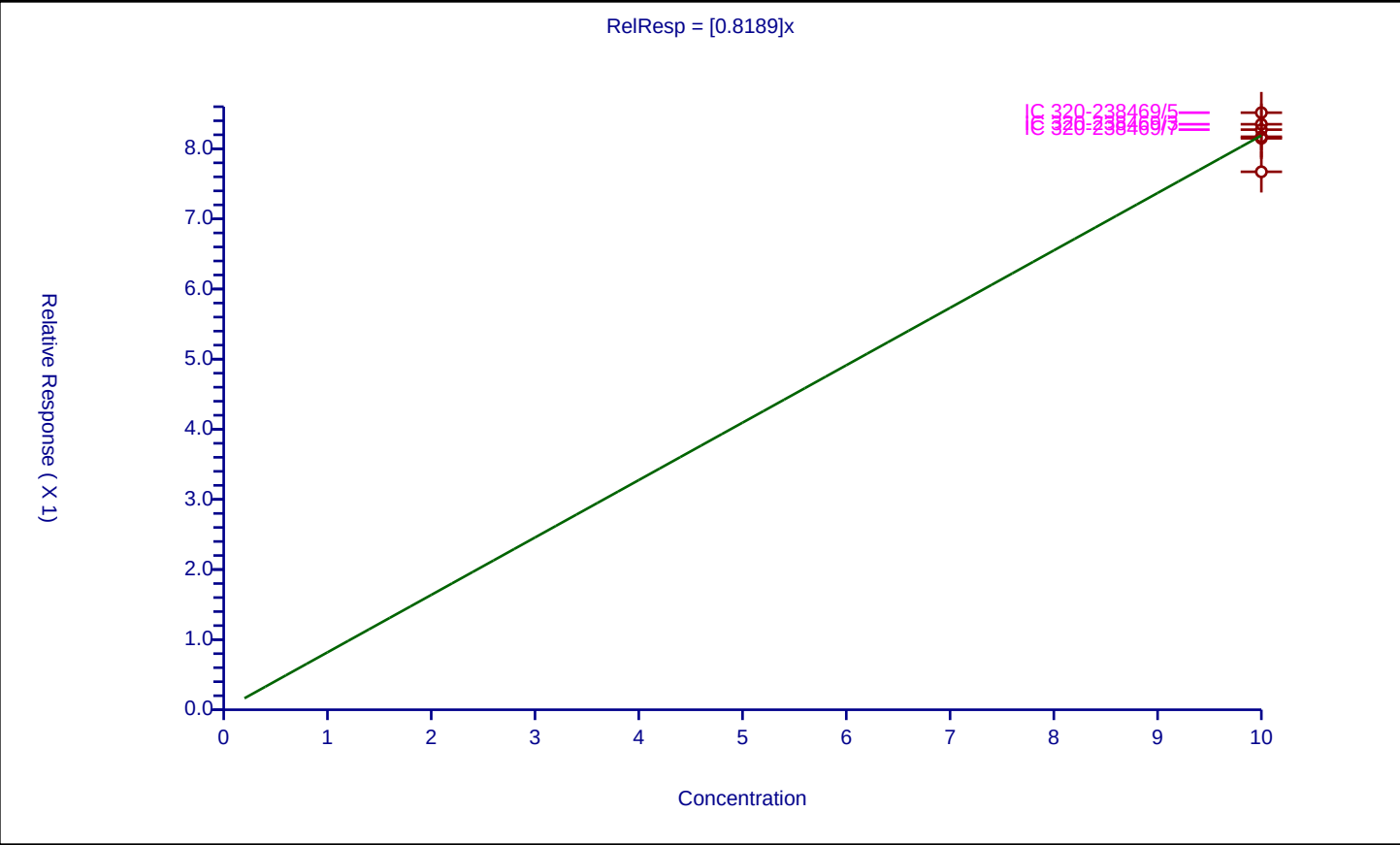
/ 13C2 PFDA

Curve Type: Average  
Weighting: Conc\_Sq  
Origin: Force  
Dependency: Response  
Calib Mode: ISTD  
Response Base: AREA  
RF Rounding: 0

| Curve Coefficients |        |
|--------------------|--------|
| Intercept:         | 0      |
| Slope:             | 0.8189 |

| Error Coefficients                       |                      |
|------------------------------------------|----------------------|
| Standard Error:                          | 1050000              |
| Relative Standard Error:                 | 3.5                  |
| Correlation Coefficient:                 | NA                   |
| Coefficient of Determination (Adjusted): | 0.000000000000000222 |

| ID | Level           | Concentration | Rel. Resp. | IS Amount | IS Response | RRF      | Used |
|----|-----------------|---------------|------------|-----------|-------------|----------|------|
| 1  | IC 320-238469/2 | 10.0          | 8.149299   | 10.0      | 1196979.0   | 0.81493  | Y    |
| 2  | IC 320-238469/3 | 10.0          | 8.350084   | 10.0      | 1204534.0   | 0.835008 | Y    |
| 3  | IC 320-238469/4 | 10.0          | 7.672103   | 10.0      | 1167019.0   | 0.76721  | Y    |
| 4  | IC 320-238469/5 | 10.0          | 8.515366   | 10.0      | 1063858.0   | 0.851537 | Y    |
| 5  | IC 320-238469/6 | 10.0          | 8.171665   | 10.0      | 1182103.0   | 0.817167 | Y    |
| 6  | IC 320-238469/7 | 10.0          | 8.273179   | 10.0      | 1182381.0   | 0.827318 | Y    |



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-238469/9 Calibration Date: 08/07/2018 13:16  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537CURVE\_010.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | Ave           | 1.184   | 1.259  |         | 21.3           | 20.0            | 6.3  | 50.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 1.076   | 1.049  |         | 2.11           | 2.16            | -2.5 | 50.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.783   | 1.727  |         | 6.51           | 6.72            | -3.2 | 50.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 1.095   | 1.051  |         | 4.22           | 4.40            | -4.1 | 50.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 1.092   | 1.042  |         | 8.39           | 8.79            | -4.5 | 50.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.7882  | 0.7696 |         | 4.30           | 4.40            | -2.4 | 50.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.095  |         | 9.96           | 10.0            | -0.4 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.8189  | 0.8007 |         | 9.78           | 10.0            | -2.2 | 30.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_010.d  
 Lims ID: CCVL  
 Client ID:  
 Sample Type: CCVL  
 Inject. Date: 07-Aug-2018 13:16:43 ALS Bottle#: 2 Worklist Smp#: 9  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L2  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Aug-2018 13:58:37 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK014

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.350 | 1.352  | -0.002 | 1.000  | 2332407  | 21.3         |                 | 3628  |       |
| 298.90 > 99.00                  | 1.350 | 1.352  | -0.002 | 1.000  | 1574823  |              | 1.48(0.00-0.00) | 2431  |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.464 | 1.468  | -0.004 | 1.000  | 1266592  | 9.96         |                 | 10956 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.601 | 1.603  | -0.002 | 1.000  | 1074594  | 6.51         |                 | 1073  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.601 | 1.605  | -0.004 | 1.000  | 262029   | 2.11         |                 | 64.1  |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.768 | 1.774  | -0.006 |        | 1156656  | 10.0         |                 | 7558  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.775 | 1.775  | 0.0    | 1.000  | 534834   | 4.22         |                 | 80.8  |       |
| 413.00 > 169.00                 | 1.768 | 1.775  | -0.007 | 0.996  | 275061   |              | 1.94(0.00-0.00) | 611   |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 2.011 | 2.016  | -0.005 |        | 2655389  | 28.7         |                 | 3793  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 2.011 | 2.018  | -0.007 | 1.000  | 847924   | 8.39         |                 | 857   |       |
| 499.00 > 99.00                  | 2.011 | 2.018  | -0.007 | 1.000  | 190952   |              | 4.44(0.00-0.00) | 592   |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 2.018 | 2.024  | -0.006 | 1.000  | 391671   | 4.30         |                 | 69.6  |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.223 | 2.220  | 0.003  | 1.000  | 926133   | 9.78         |                 | 6522  |       |

**Reagents:**

LC537-L2\_00022

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_010.d

Injection Date: 07-Aug-2018 13:16:43

Instrument ID: A8\_N

Lims ID: CCVL

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 2

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

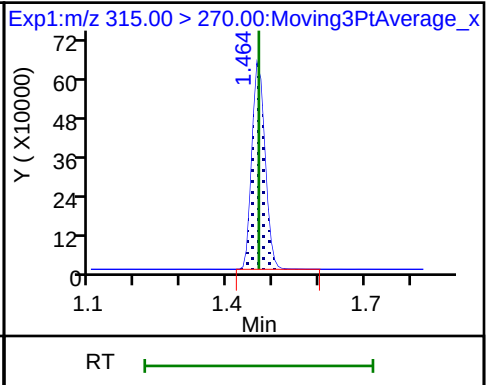
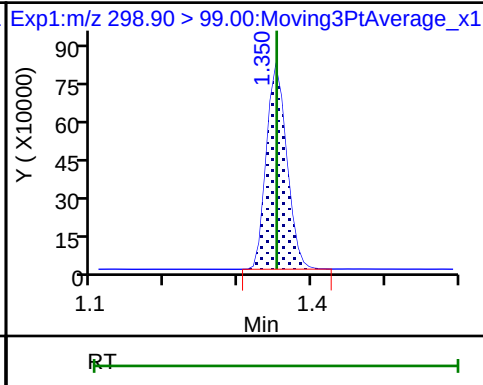
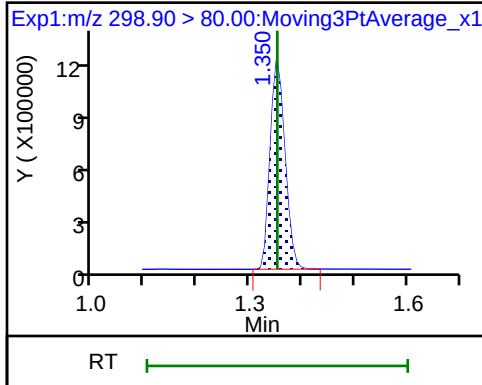
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

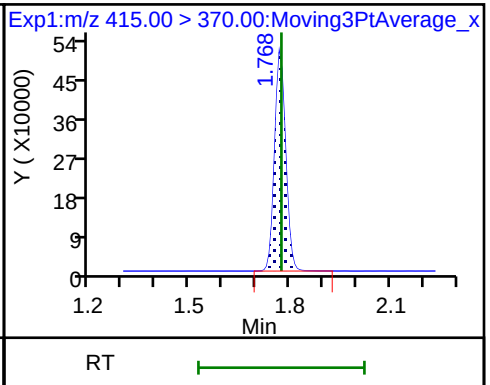
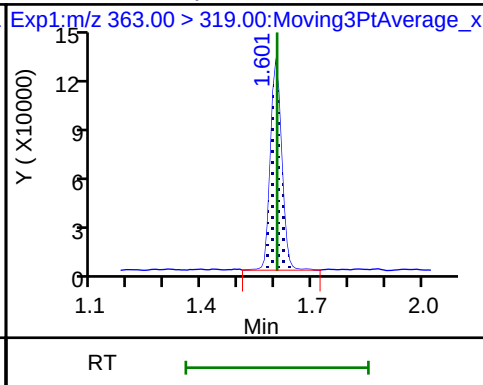
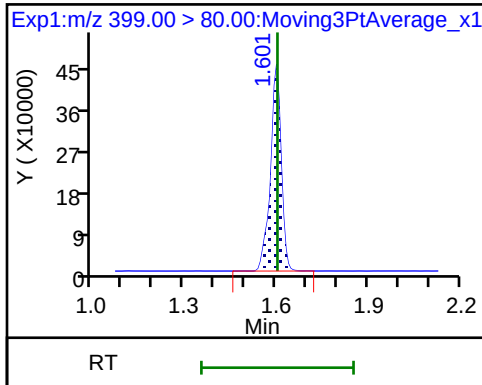
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

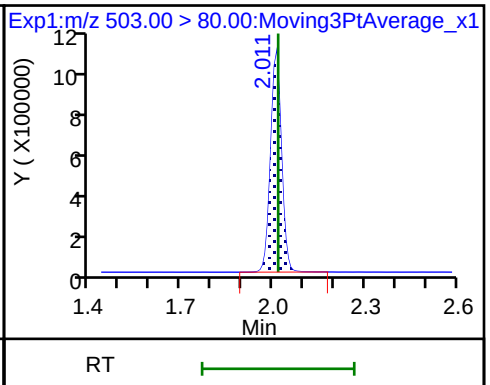
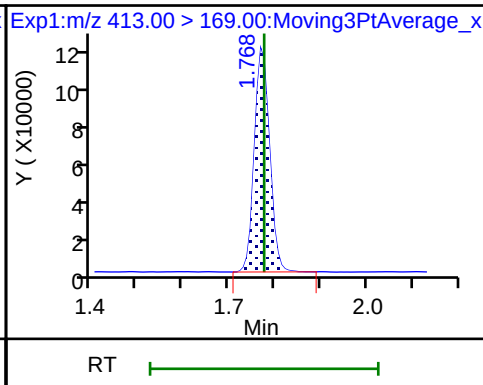
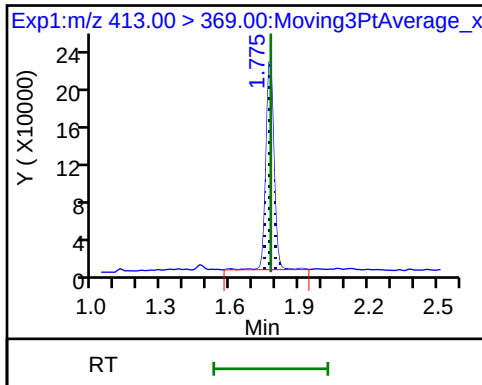
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

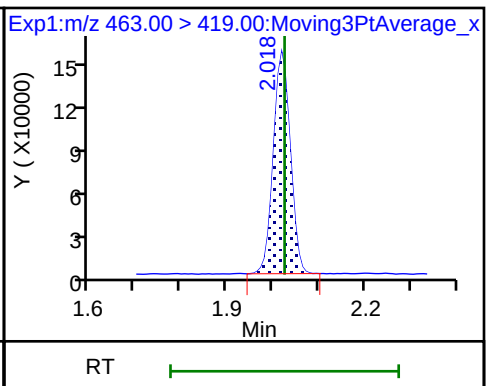
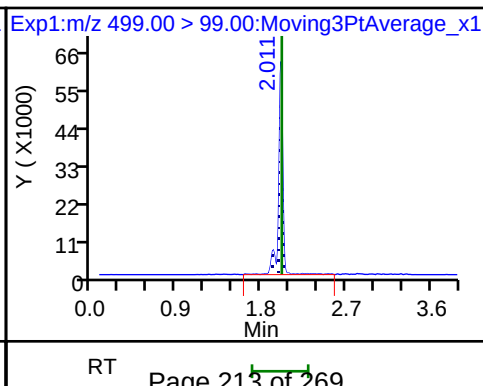
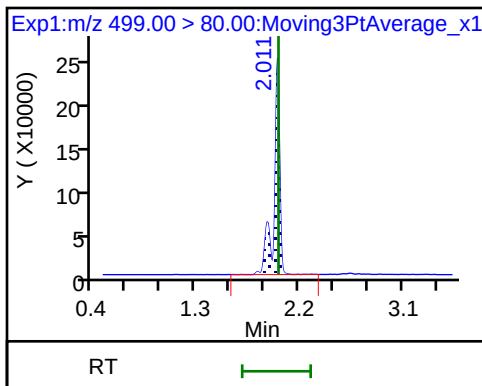
## \* 7 13C4 PFOS



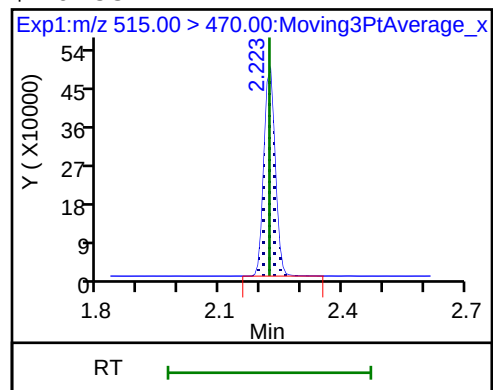
## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid

## 9 Perfluorononanoic acid



\$ 10 13C2 PFDA





FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: ICV 320-238469/11 Calibration Date: 08/07/2018 13:26  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537CURVE\_012.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D    | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|-------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | Ave           | 1.184   | 0.997  |         | 84.2           | 100             | -15.8 | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 1.076   | 0.9540 |         | 8.87           | 10.0            | -11.3 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.783   | 1.603  |         | 18.1           | 20.2            | -10.1 | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 1.095   | 0.9056 |         | 16.7           | 20.2            | -17.3 | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 1.092   | 0.9574 |         | 17.7           | 20.2            | -12.3 | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.7882  | 0.7380 |         | 18.9           | 20.2            | -6.4  | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.045  |         | 9.51           | 10.0            | -4.9  | 30.0      |
| 13C2 PFDA                               | Ave           | 0.8189  | 0.7952 |         | 9.71           | 10.0            | -2.9  | 30.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_012.d  
 Lims ID: ICV  
 Client ID:  
 Sample Type: ICV  
 Inject. Date: 07-Aug-2018 13:26:01 ALS Bottle#: 7 Worklist Smp#: 11  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: ICV  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 07-Aug-2018 13:58:48 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK014

First Level Reviewer: barnettj

Date: 07-Aug-2018 13:58:44

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.350 | 1.352  | -0.002 | 1.000  | 9545617  | 84.2         |                 | 11052 |       |
| 298.90 > 99.00                  | 1.350 | 1.352  | -0.002 | 1.000  | 6956258  |              | 1.37(0.00-0.00) | 8328  |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.472 | 1.468  | 0.004  | 1.000  | 1254206  | 9.51         |                 | 10046 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.601 | 1.603  | -0.002 | 1.000  | 3092385  | 18.1         |                 | 3048  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.601 | 1.605  | -0.004 | 1.000  | 1144602  | 8.87         |                 | 256   |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.775 | 1.774  | 0.001  |        | 1199776  | 10.0         |                 | 6991  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.775 | 1.775  | 0.0    | 1.000  | 2191205  | 16.7         |                 | 318   |       |
| 413.00 > 169.00                 | 1.775 | 1.775  | 0.0    | 1.000  | 1130846  |              | 1.94(0.00-0.00) | 2324  |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 2.011 | 2.016  | -0.005 |        | 2744266  | 28.7         |                 | 3771  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 2.011 | 2.018  | -0.007 | 1.000  | 1847813  | 17.7         |                 | 1537  |       |
| 499.00 > 99.00                  | 2.011 | 2.018  | -0.007 | 1.000  | 358705   |              | 5.15(0.00-0.00) | 799   |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 2.018 | 2.024  | -0.006 | 1.000  | 1785291  | 18.9         |                 | 315   |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.215 | 2.220  | -0.005 | 1.000  | 954033   | 9.71         |                 | 8012  |       |

**Reagents:**

LC537-ICV\_00032

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_012.d

Injection Date: 07-Aug-2018 13:26:01

Instrument ID: A8\_N

Lims ID: ICV

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 7

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

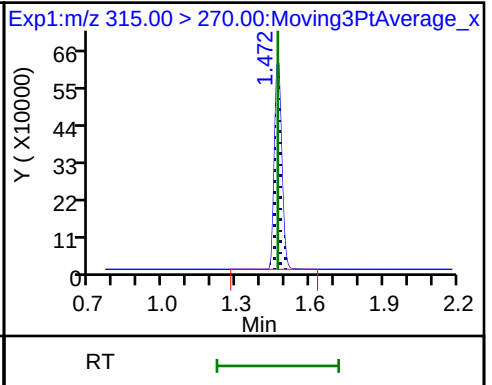
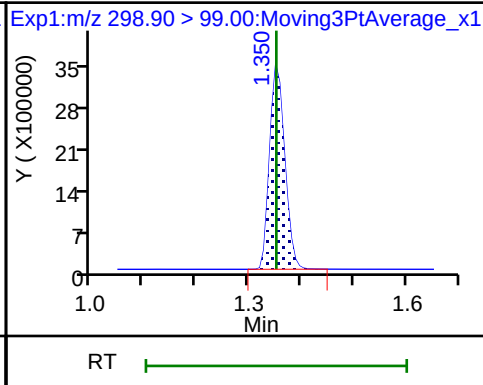
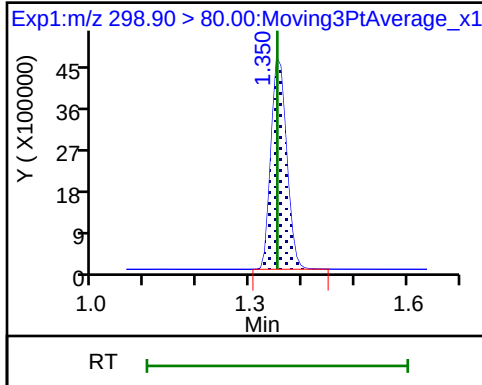
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

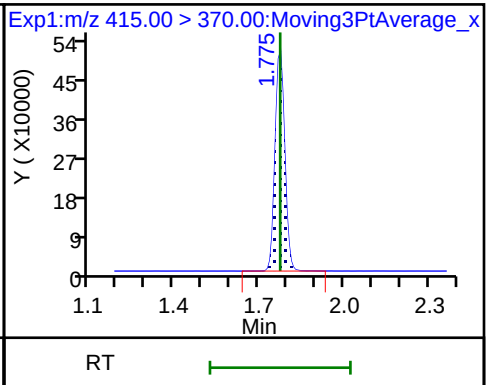
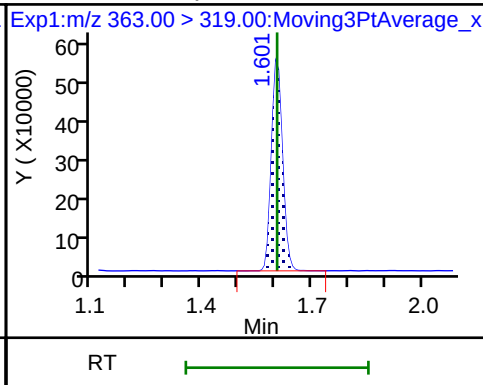
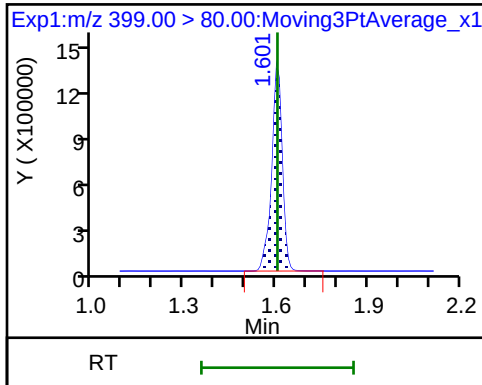
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

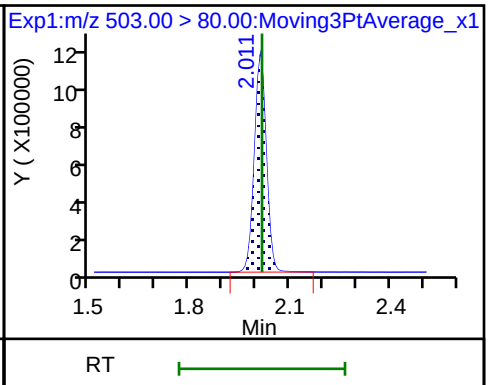
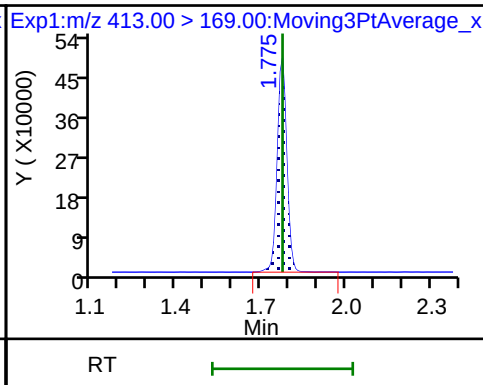
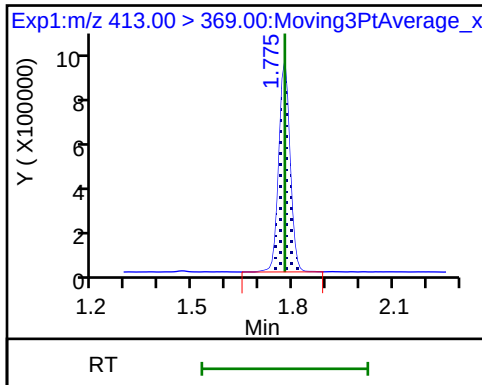
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

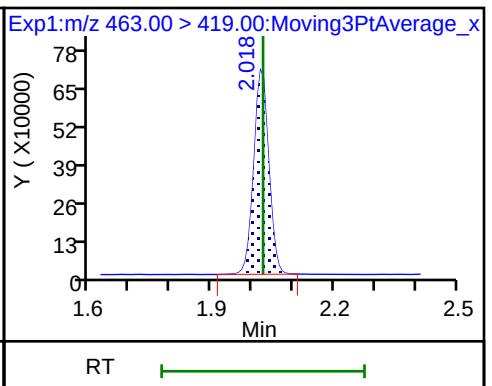
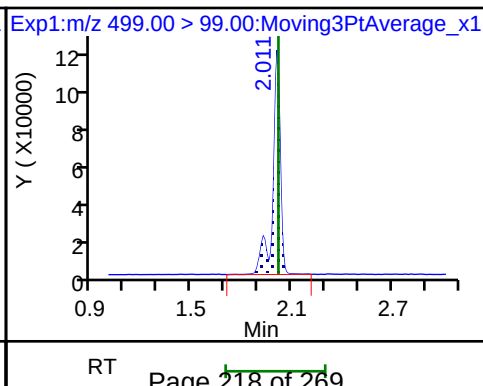
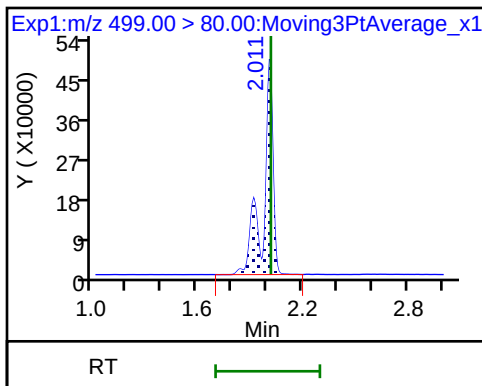
## \* 7 13C4 PFOS



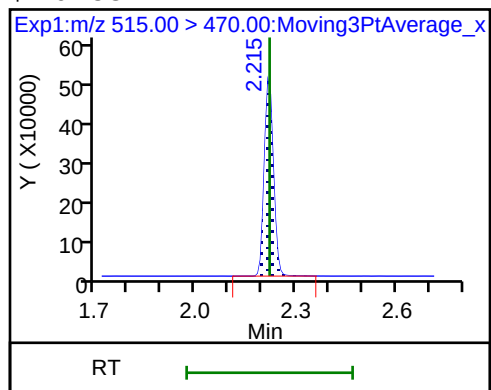
## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid

## 9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-238776/1 Calibration Date: 08/08/2018 03:07  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537C\_003.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | Ave           | 1.184   | 1.243  |         | 21.0           | 20.0            | 4.9  | 50.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 1.076   | 1.031  |         | 2.07           | 2.16            | -4.2 | 50.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.783   | 1.702  |         | 6.42           | 6.72            | -4.5 | 50.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 1.095   | 1.034  |         | 4.15           | 4.40            | -5.6 | 50.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 1.092   | 1.067  |         | 8.59           | 8.79            | -2.2 | 50.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.7882  | 0.7564 |         | 4.22           | 4.40            | -4.0 | 50.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.051  |         | 9.56           | 10.0            | -4.4 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.8189  | 0.7584 |         | 9.26           | 10.0            | -7.4 | 30.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62320.b\2018.08.07\_537C\_003.d  
 Lims ID: CCVL  
 Client ID:  
 Sample Type: CCVL  
 Inject. Date: 08-Aug-2018 03:07:27 ALS Bottle#: 2 Worklist Smp#: 1  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCVL  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62320.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:16:03 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.350 | 1.350  | 0.0    | 1.000  | 2397538  | 21.0         |                 | 2307  |       |
| 298.90 > 99.00                  | 1.350 | 1.350  | 0.0    | 1.000  | 1646394  |              | 1.46(0.00-0.00) | 2304  |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.464 | 1.464  | 0.0    | 1.000  | 1294337  | 9.56         |                 | 12769 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.593 | 1.601  | -0.008 | 1.000  | 1103063  | 6.42         |                 | 1158  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.593 | 1.601  | -0.008 | 1.000  | 274260   | 2.07         |                 | 55.0  |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.760 | 1.768  | -0.008 |        | 1231833  | 10.0         |                 | 8035  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.760 | 1.768  | -0.008 | 1.000  | 560639   | 4.15         |                 | 92.4  |       |
| 413.00 > 169.00                 | 1.760 | 1.768  | -0.008 | 1.000  | 287177   |              | 1.95(0.00-0.00) | 676   |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 1.995 | 1.995  | 0.0    |        | 2765004  | 28.7         |                 | 3893  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 2.003 | 2.011  | -0.008 | 1.000  | 409995   | 4.22         |                 | 57.0  |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 1.995 | 2.018  | -0.023 | 1.000  | 903781   | 8.59         |                 | 602   |       |
| 499.00 > 99.00                  | 1.995 | 2.018  | -0.023 | 1.000  | 199367   |              | 4.53(0.00-0.00) | 492   |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.208 | 2.215  | -0.007 | 1.000  | 934259   | 9.26         |                 | 7309  |       |

### Reagents:

LC537-L2\_00022

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62320.b\2018.08.07\_537C\_003.d

Injection Date: 08-Aug-2018 03:07:27

Instrument ID: A8\_N

Lims ID: CCVL

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 2

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

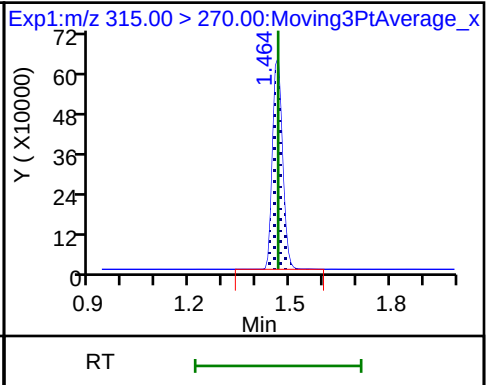
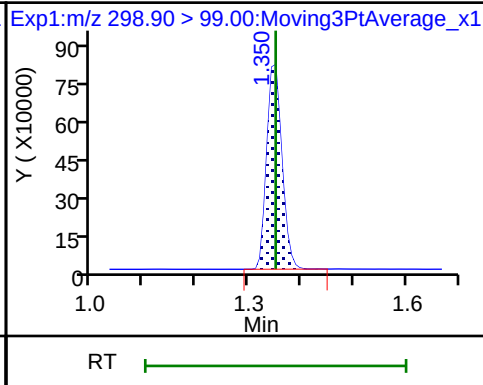
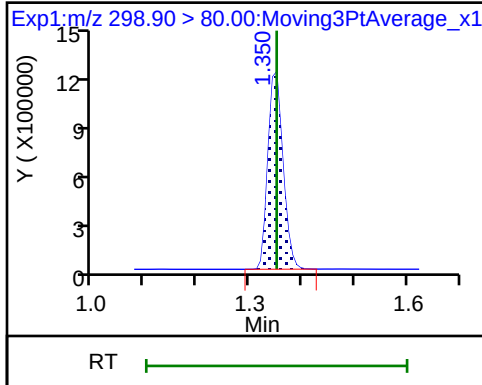
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

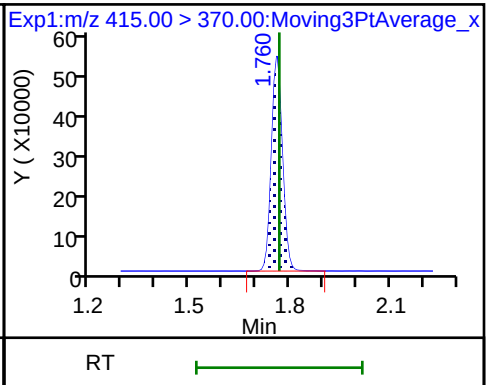
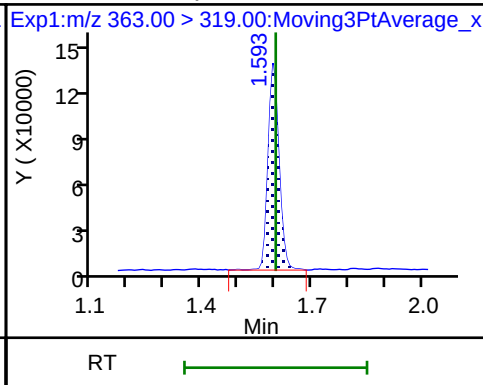
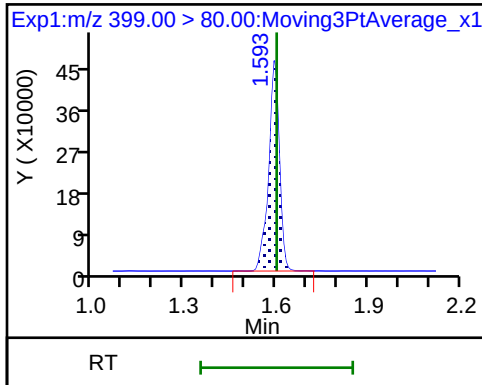
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

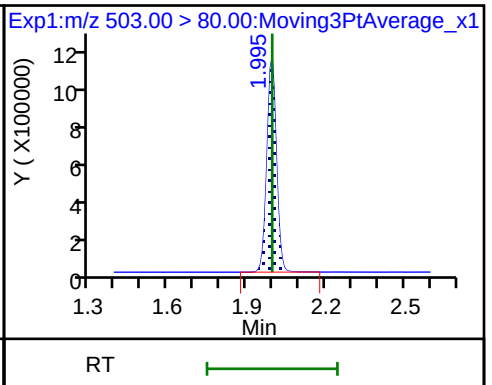
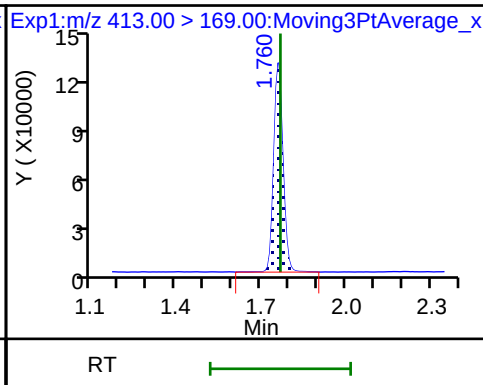
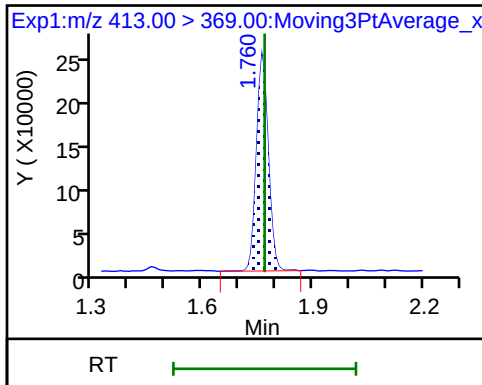
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

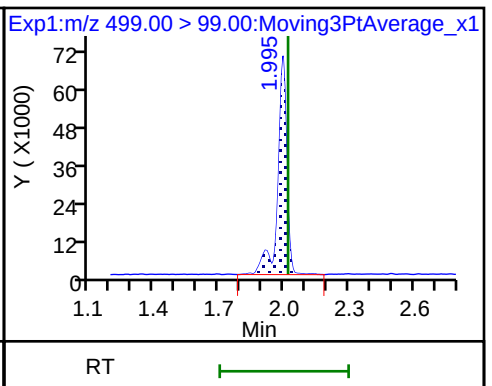
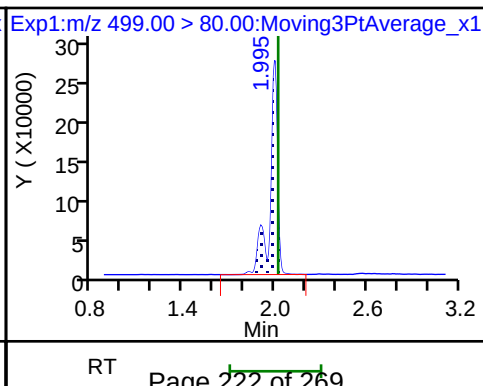
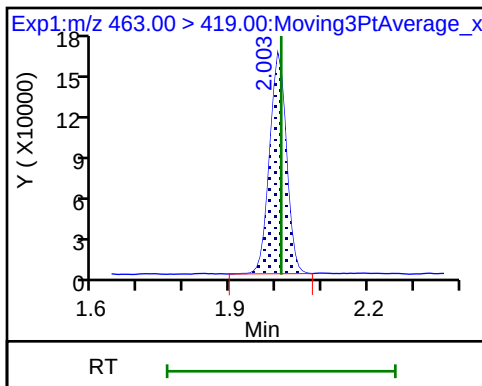
## \* 7 13C4 PFOS



## 9 Perfluorononanoic acid

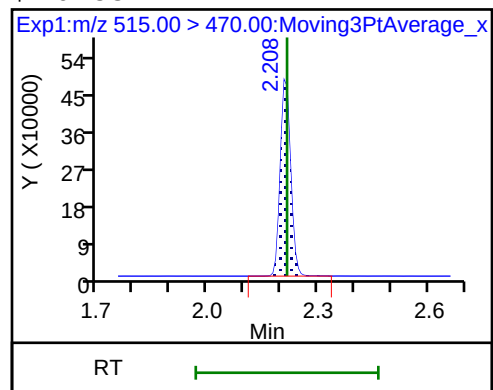
## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid





\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-238610/1 Calibration Date: 08/08/2018 04:31  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537C\_021.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | Ave           | 1.184   | 1.228  |         | 46.7           | 45.0            | 3.7  | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 1.076   | 1.077  |         | 4.87           | 4.86            | 0.2  | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.783   | 1.742  |         | 14.8           | 15.1            | -2.3 | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 1.095   | 1.069  |         | 9.66           | 9.90            | -2.4 | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 1.092   | 1.062  |         | 19.2           | 19.8            | -2.7 | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.7882  | 0.8206 |         | 10.3           | 9.90            | 4.1  | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.088  |         | 9.89           | 10.0            | -1.1 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.8189  | 0.7990 |         | 9.76           | 10.0            | -2.4 | 30.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_021.d  
 Lims ID: CCV L3  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 08-Aug-2018 04:31:36 ALS Bottle#: 3 Worklist Smp#: 1  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L3  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.350 | 1.350  | 0.0    | 1.000  | 4994756  | 46.7         |                 | 4298  |       |
| 298.90 > 99.00                  | 1.350 | 1.350  | 0.0    | 1.000  | 3585550  |              | 1.39(0.00-0.00) | 4903  |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.464 | 1.464  | 0.0    | 1.000  | 1201540  | 9.89         |                 | 11168 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.593 | 1.593  | 0.0    | 1.000  | 2380823  | 14.8         |                 | 2199  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.593 | 1.593  | 0.0    | 1.000  | 578442   | 4.87         |                 | 107   |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.760 | 1.760  | 0.0    |        | 1104849  | 10.0         |                 | 7206  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.760 | 1.760  | 0.0    | 1.000  | 1169317  | 9.66         |                 | 180   |       |
| 413.00 > 169.00                 | 1.760 | 1.760  | 0.0    | 1.000  | 599313   |              | 1.95(0.00-0.00) | 1508  |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 1.988 | 1.988  | 0.0    |        | 2591082  | 28.7         |                 | 3465  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 1.995 | 1.995  | 0.0    | 1.000  | 897572   | 10.3         |                 | 116   |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 1.988 | 2.018  | -0.030 | 1.000  | 1896420  | 19.2         |                 | 1305  |       |
| 499.00 > 99.00                  | 1.988 | 2.018  | -0.030 | 1.000  | 419600   |              | 4.52(0.00-0.00) | 1007  |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.208 | 2.208  | 0.0    | 1.000  | 882768   | 9.76         |                 | 7494  |       |

### Reagents:

LC537-L3\_00025

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_021.d

Injection Date: 08-Aug-2018 04:31:36

Instrument ID: A8\_N

Lims ID: CCV L3

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 3

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

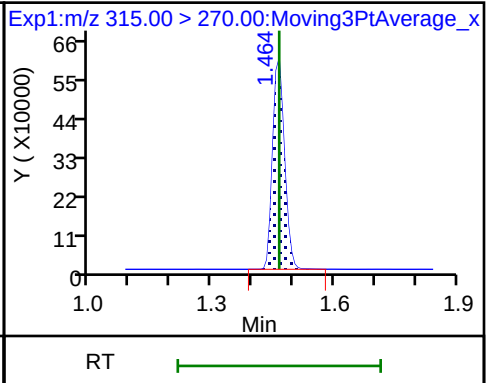
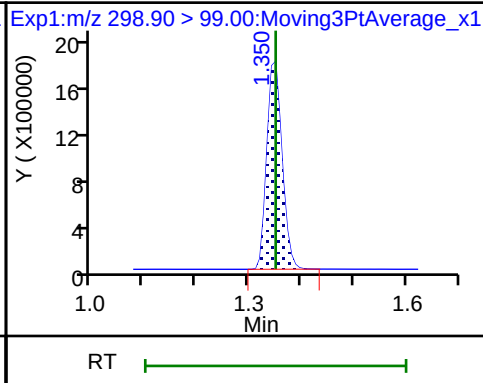
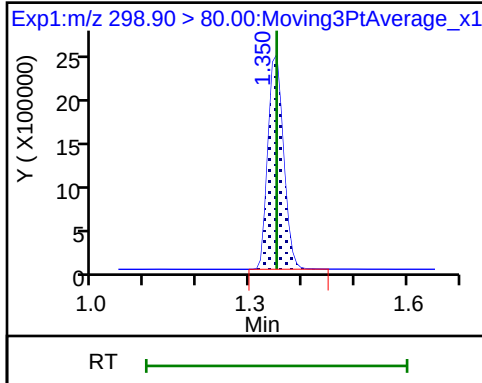
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

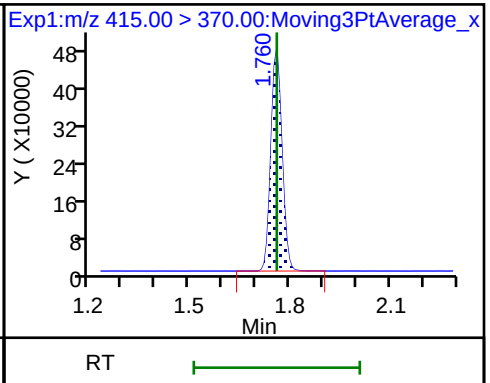
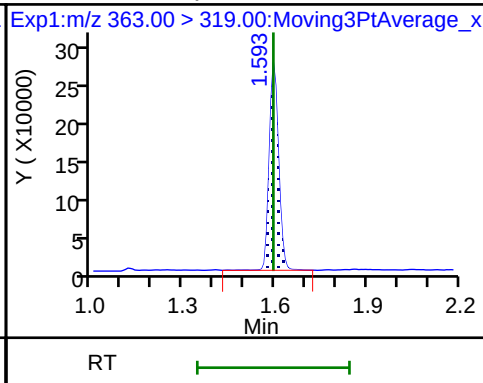
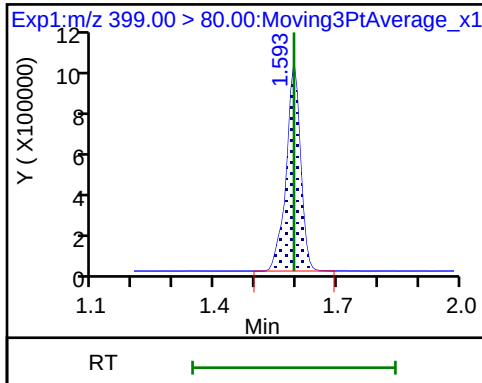
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

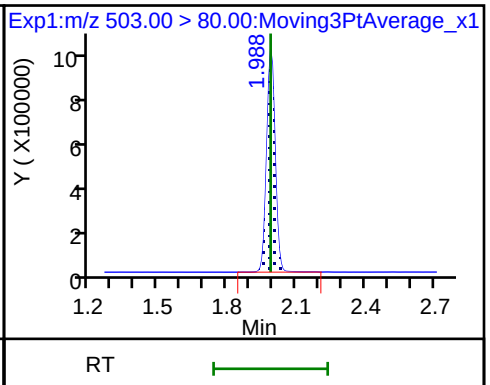
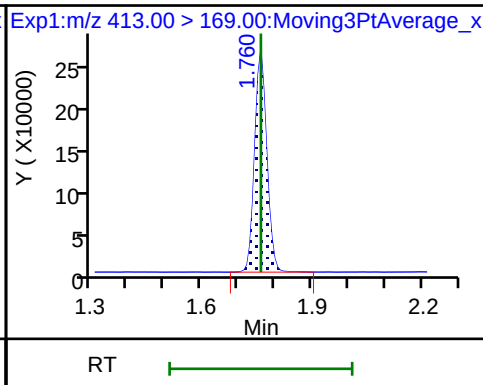
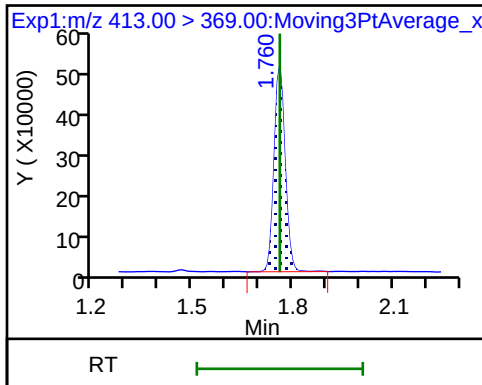
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

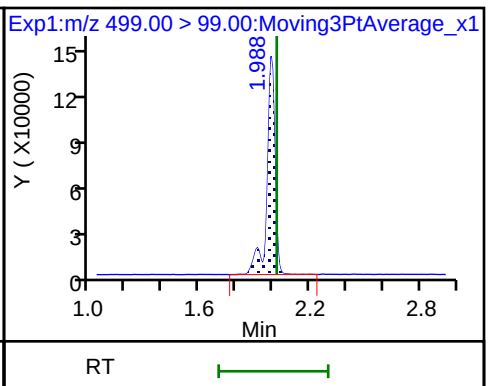
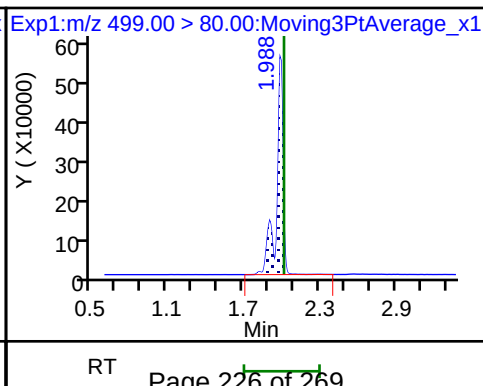
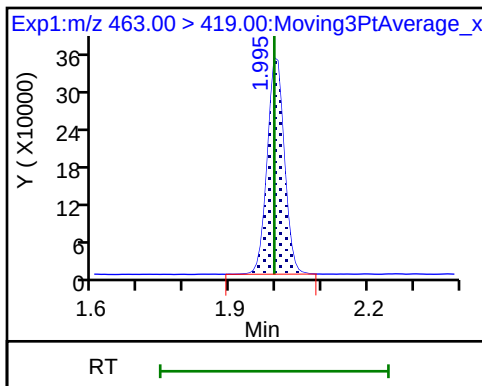
## \* 7 13C4 PFOS



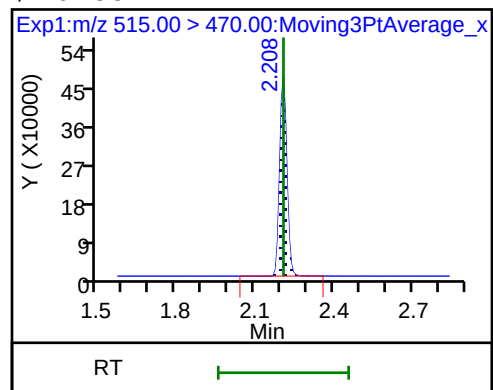
## 9 Perfluorononanoic acid

## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-238610/13 Calibration Date: 08/08/2018 05:27  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537C\_033.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | Ave           | 1.184   | 1.165  |         | 133            | 135             | -1.6 | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 1.076   | 1.063  |         | 14.4           | 14.6            | -1.2 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.783   | 1.839  |         | 46.8           | 45.4            | 3.1  | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 1.095   | 1.094  |         | 29.7           | 29.7            | -0.0 | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 1.092   | 1.131  |         | 61.4           | 59.3            | 3.6  | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.7882  | 0.7713 |         | 29.1           | 29.7            | -2.1 | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.074  |         | 9.77           | 10.0            | -2.3 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.8189  | 0.8057 |         | 9.84           | 10.0            | -1.6 | 30.0      |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-238612/13 Calibration Date: 08/08/2018 05:27  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537C\_033.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | Ave           | 1.184   | 1.165  |         | 133            | 135             | -1.6 | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 1.076   | 1.063  |         | 14.4           | 14.6            | -1.2 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.783   | 1.839  |         | 46.8           | 45.4            | 3.1  | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 1.095   | 1.094  |         | 29.7           | 29.7            | -0.0 | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 1.092   | 1.131  |         | 61.4           | 59.3            | 3.6  | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.7882  | 0.7713 |         | 29.1           | 29.7            | -2.1 | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.074  |         | 9.77           | 10.0            | -2.3 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.8189  | 0.8057 |         | 9.84           | 10.0            | -1.6 | 30.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_033.d  
 Lims ID: CCV L5  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 08-Aug-2018 05:27:41 ALS Bottle#: 5 Worklist Smp#: 13  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L5  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.350 | 1.350  | 0.0    | 1.000  | 13113634 | 132.9        |                 | 9065  |       |
| 298.90 > 99.00                  | 1.350 | 1.350  | 0.0    | 1.000  | 9290556  |              | 1.41(0.00-0.00) | 10709 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.464 | 1.464  | 0.0    | 1.000  | 1178294  | 9.77         |                 | 10521 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.593 | 1.593  | 0.0    | 1.000  | 6953371  | 46.8         |                 | 5588  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.593 | 1.593  | 0.0    | 1.000  | 1700507  | 14.4         |                 | 329   |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.760 | 1.760  | 0.0    |        | 1097335  | 10.0         |                 | 7449  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.760 | 1.760  | 0.0    | 1.000  | 3567051  | 29.7         |                 | 559   |       |
| 413.00 > 169.00                 | 1.760 | 1.760  | 0.0    | 1.000  | 1758505  |              | 2.03(0.00-0.00) | 4194  |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 1.995 | 1.995  | 0.0    |        | 2390195  | 28.7         |                 | 3201  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 2.003 | 2.003  | 0.0    | 1.000  | 2513613  | 29.1         |                 | 337   |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 1.995 | 2.018  | -0.023 | 1.000  | 5587655  | 61.4         |                 | 3127  |       |
| 499.00 > 99.00                  | 1.995 | 2.018  | -0.023 | 1.000  | 1173161  |              | 4.76(0.00-0.00) | 2696  |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.208 | 2.208  | 0.0    | 1.000  | 884063   | 9.84         |                 | 6910  |       |

### Reagents:

LC537-L5\_00026

Amount Added: 1.00

Units: mL



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_033.d  
 Lims ID: CCV L5  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 08-Aug-2018 05:27:41 ALS Bottle#: 5 Worklist Smp#: 13  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L5  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:54:09 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.350 | 1.350  | 0.0    | 1.000  | 13113634 | 132.9        |                 | 9065  |       |
| 298.90 > 99.00                  | 1.350 | 1.350  | 0.0    | 1.000  | 9290556  |              | 1.41(0.00-0.00) | 10709 |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.464 | 1.464  | 0.0    | 1.000  | 1178294  | 9.77         |                 | 10521 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.593 | 1.593  | 0.0    | 1.000  | 6953371  | 46.8         |                 | 5588  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.593 | 1.593  | 0.0    | 1.000  | 1700507  | 14.4         |                 | 329   |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.760 | 1.760  | 0.0    |        | 1097335  | 10.0         |                 | 7449  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.760 | 1.760  | 0.0    | 1.000  | 3567051  | 29.7         |                 | 559   |       |
| 413.00 > 169.00                 | 1.760 | 1.760  | 0.0    | 1.000  | 1758505  |              | 2.03(0.00-0.00) | 4194  |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 1.995 | 1.995  | 0.0    |        | 2390195  | 28.7         |                 | 3201  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 2.003 | 2.003  | 0.0    | 1.000  | 2513613  | 29.1         |                 | 337   |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 1.995 | 2.018  | -0.023 | 1.000  | 5587655  | 61.4         |                 | 3127  |       |
| 499.00 > 99.00                  | 1.995 | 2.018  | -0.023 | 1.000  | 1173161  |              | 4.76(0.00-0.00) | 2696  |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.208 | 2.208  | 0.0    | 1.000  | 884063   | 9.84         |                 | 6910  |       |

### Reagents:

LC537-L5\_00026

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_033.d

Injection Date: 08-Aug-2018 05:27:41

Instrument ID: A8\_N

Lims ID: CCV L5

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 5

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

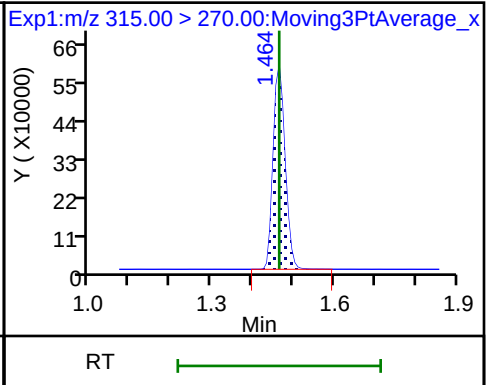
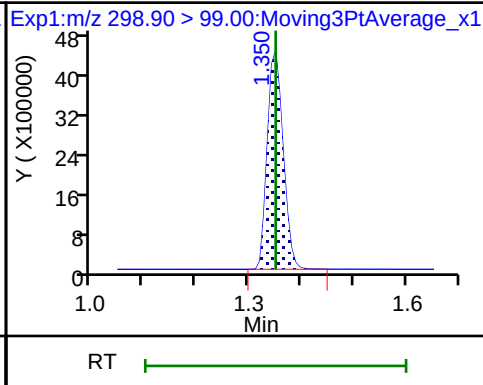
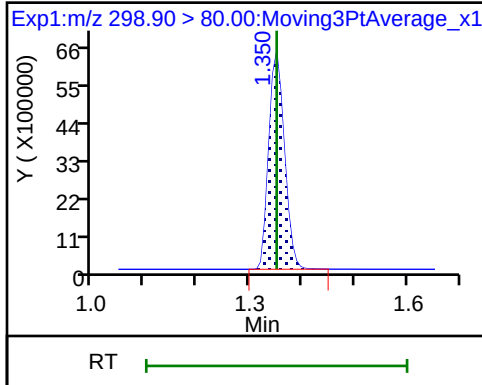
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

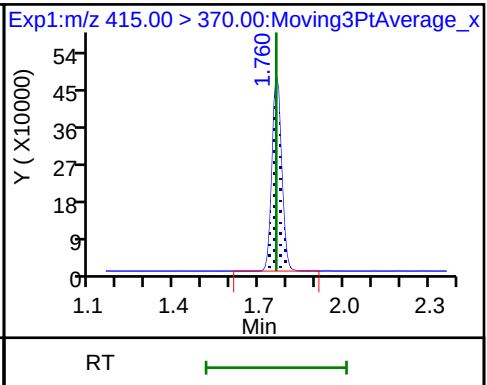
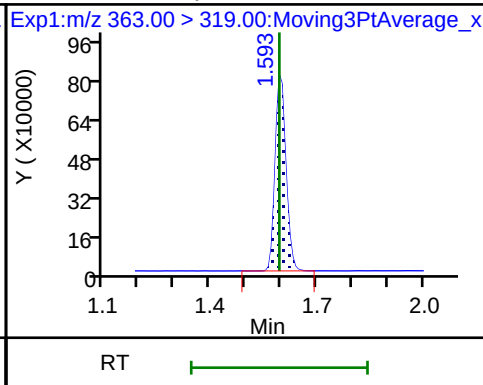
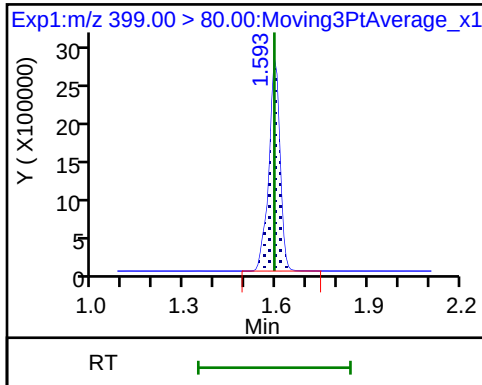
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

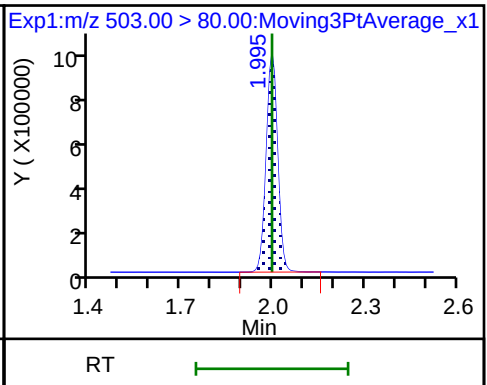
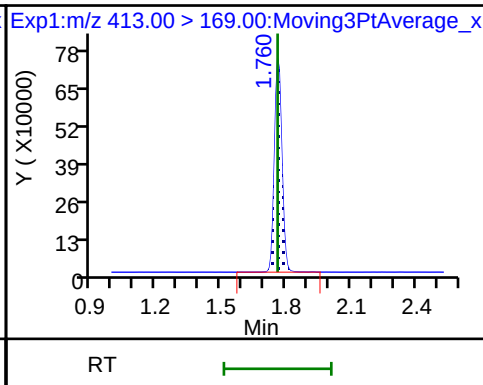
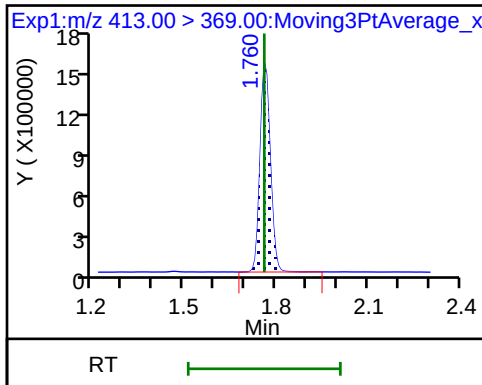
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

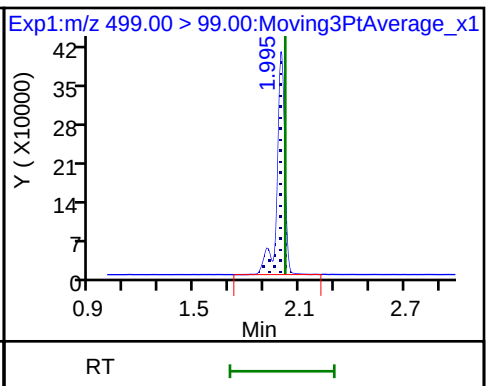
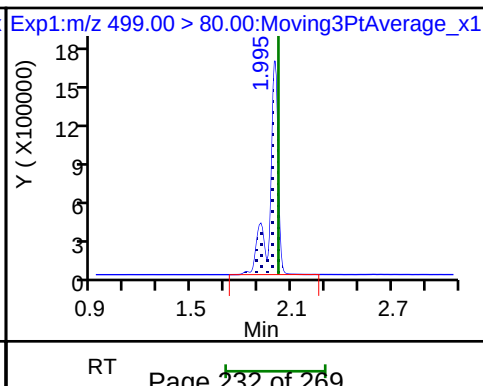
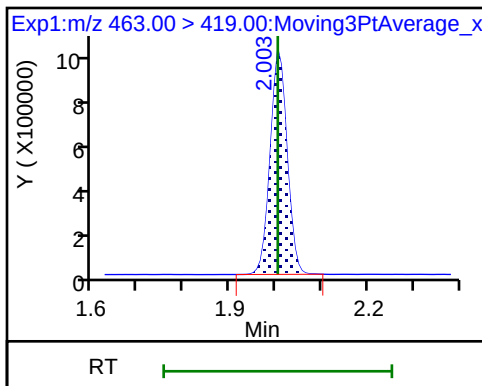
## \* 7 13C4 PFOS



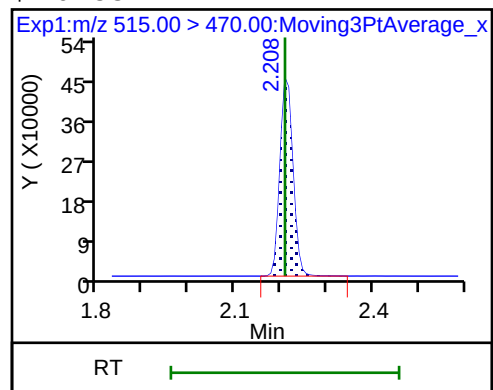
## 9 Perfluorononanoic acid

## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_033.d

Injection Date: 08-Aug-2018 05:27:41

Instrument ID: A8\_N

Lims ID: CCV L5

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 5

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

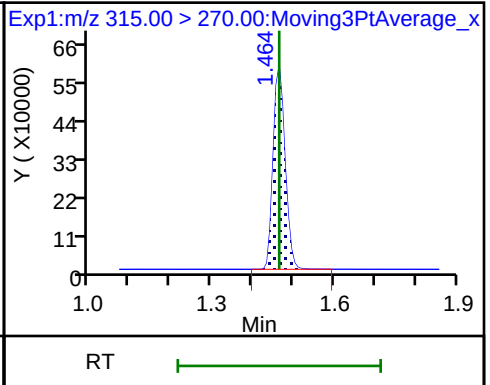
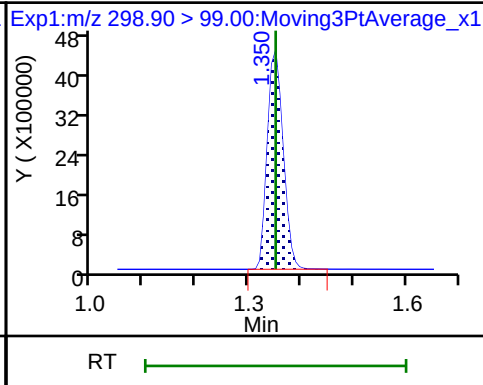
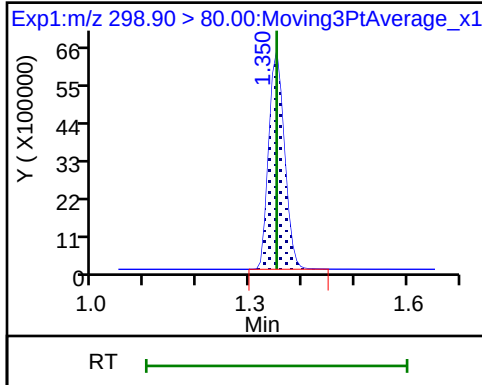
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

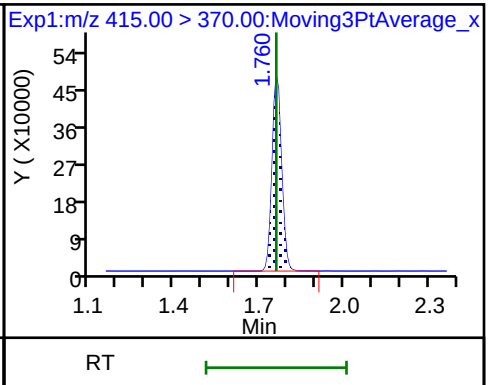
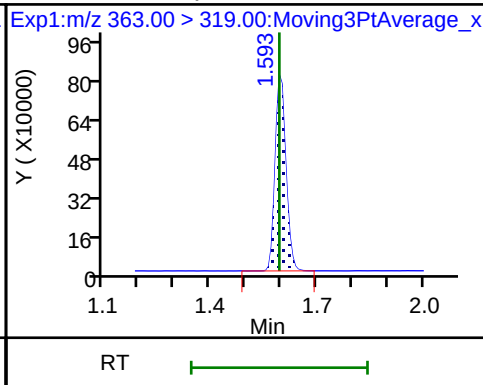
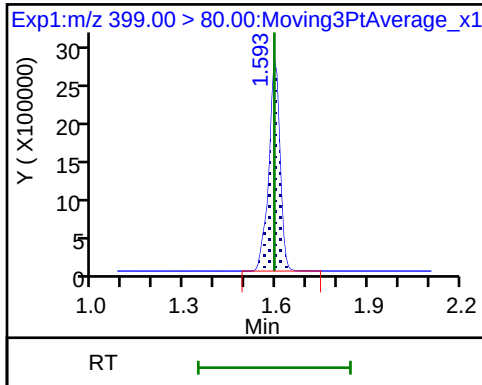
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

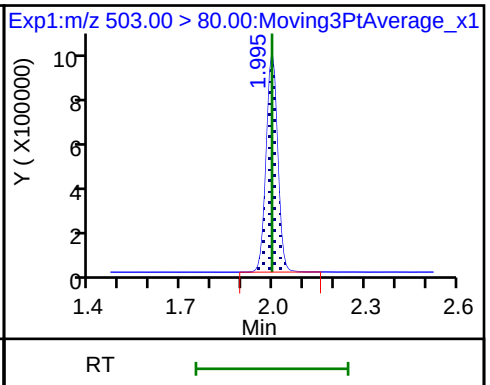
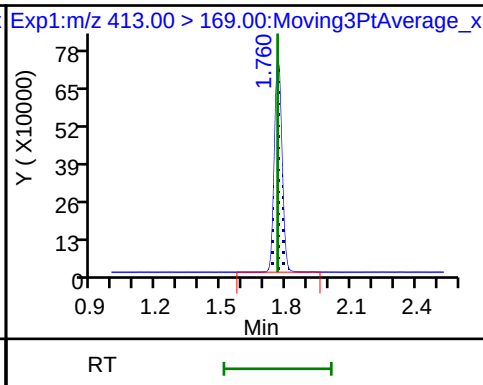
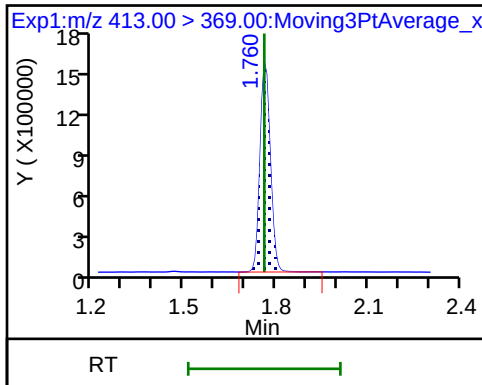
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

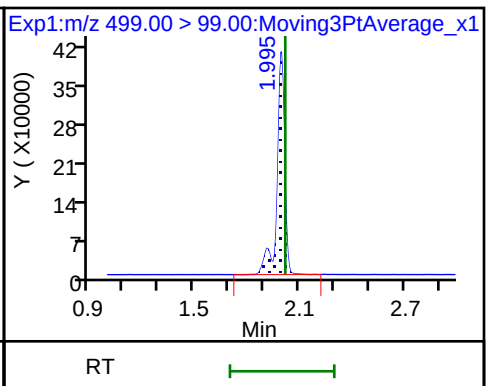
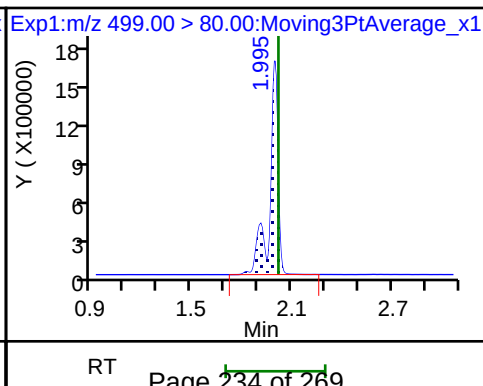
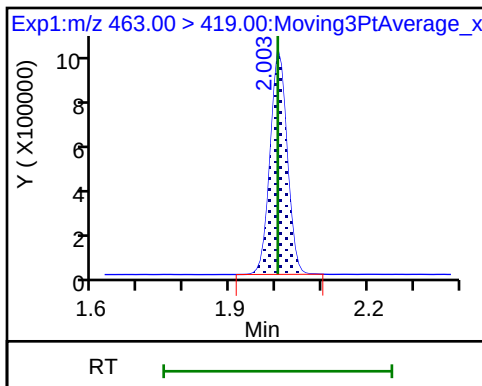
## \* 7 13C4 PFOS



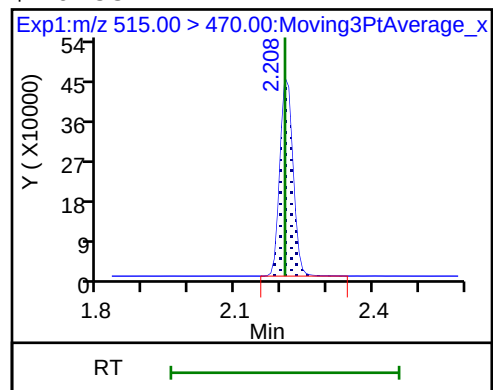
## 9 Perfluorononanoic acid

## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-238612/21 Calibration Date: 08/08/2018 06:05  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537C\_041.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | Ave           | 1.184   | 1.278  |         | 48.6           | 45.0            | 7.9  | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 1.076   | 1.067  |         | 4.82           | 4.86            | -0.8 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.783   | 1.744  |         | 14.8           | 15.1            | -2.2 | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 1.095   | 1.044  |         | 9.44           | 9.90            | -4.7 | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 1.092   | 1.080  |         | 19.6           | 19.8            | -1.0 | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.7882  | 0.7579 |         | 9.52           | 9.90            | -3.8 | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.058  |         | 9.62           | 10.0            | -3.8 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.8189  | 0.7925 |         | 9.68           | 10.0            | -3.2 | 30.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_041.d  
 Lims ID: CCV L3  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 08-Aug-2018 06:05:02 ALS Bottle#: 3 Worklist Smp#: 21  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L3  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub9  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:54:17 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.343 | 1.343  | 0.0    | 1.000  | 4968469  | 48.6         |                 | 4205  |       |
| 298.90 > 99.00                  | 1.343 | 1.343  | 0.0    | 1.000  | 3380389  |              | 1.47(0.00-0.00) | 5174  |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.457 | 1.457  | 0.0    | 1.000  | 1158289  | 9.62         |                 | 10289 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.586 | 1.586  | 0.0    | 1.000  | 2277114  | 14.8         |                 | 2055  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.586 | 1.586  | 0.0    | 1.000  | 567831   | 4.82         |                 | 112   |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.753 | 1.753  | 0.0    |        | 1095270  | 10.0         |                 | 6874  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.753 | 1.753  | 0.0    | 1.000  | 1132415  | 9.44         |                 | 174   |       |
| 413.00 > 169.00                 | 1.753 | 1.753  | 0.0    | 1.000  | 585576   |              | 1.93(0.00-0.00) | 1596  |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 1.988 | 1.988  | 0.0    |        | 2475586  | 28.7         |                 | 3081  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 1.995 | 1.995  | 0.0    | 1.000  | 821758   | 9.52         |                 | 106   |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 1.988 | 2.018  | -0.030 | 1.000  | 1843379  | 19.6         |                 | 1183  |       |
| 499.00 > 99.00                  | 1.988 | 2.018  | -0.030 | 1.000  | 400522   |              | 4.60(0.00-0.00) | 1012  |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.200 | 2.200  | 0.0    | 1.000  | 868002   | 9.68         |                 | 6492  |       |

### Reagents:

LC537-L3\_00025

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_041.d

Injection Date: 08-Aug-2018 06:05:02

Instrument ID: A8\_N

Lims ID: CCV L3

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 3

Worklist Smp#: 21

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

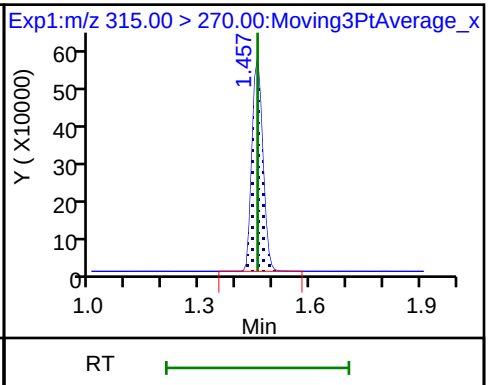
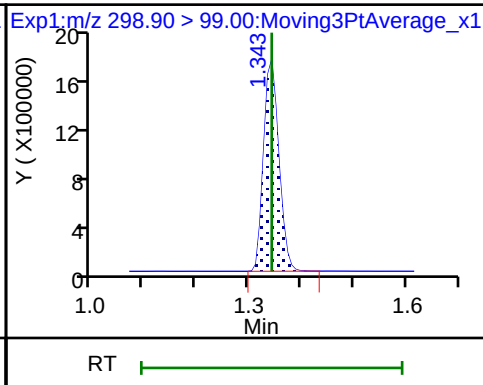
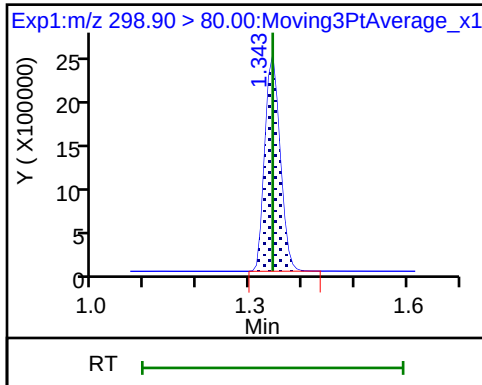
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

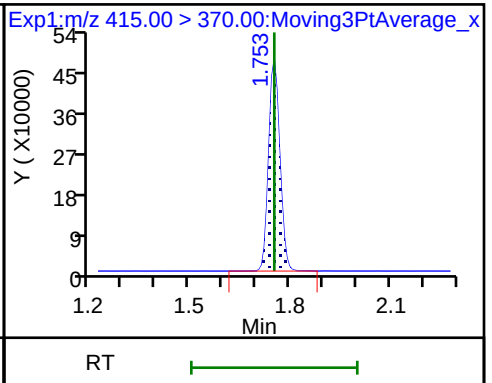
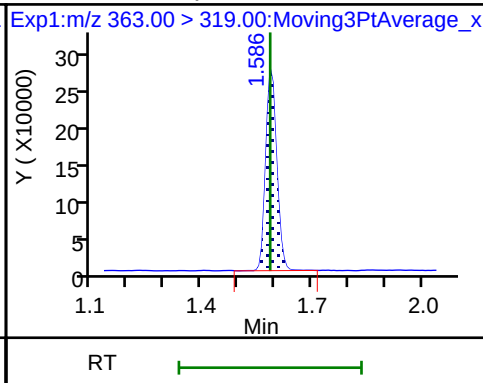
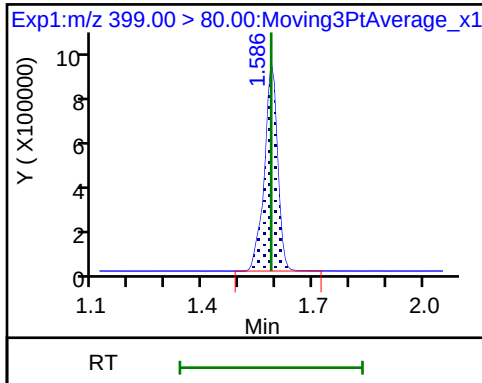
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

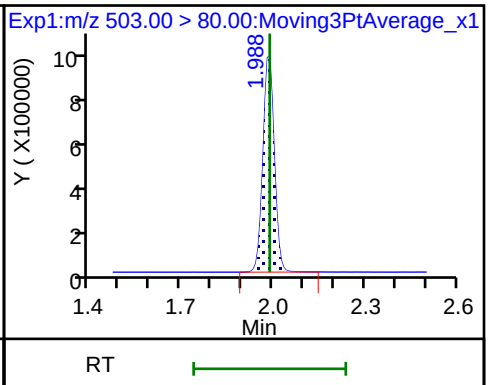
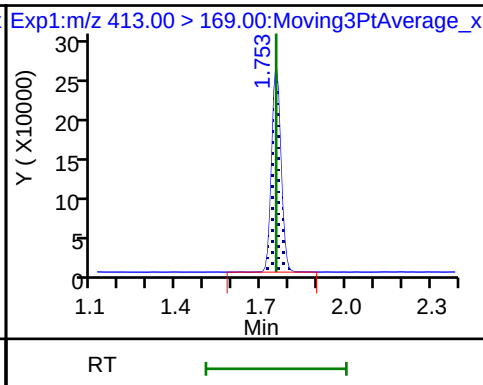
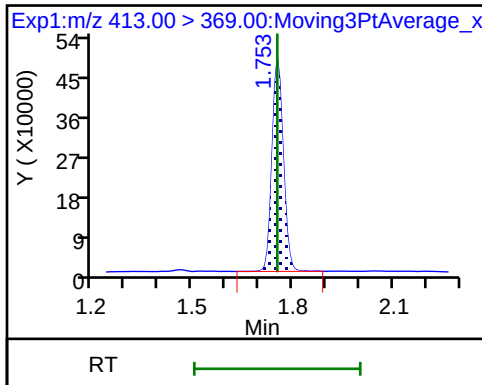
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

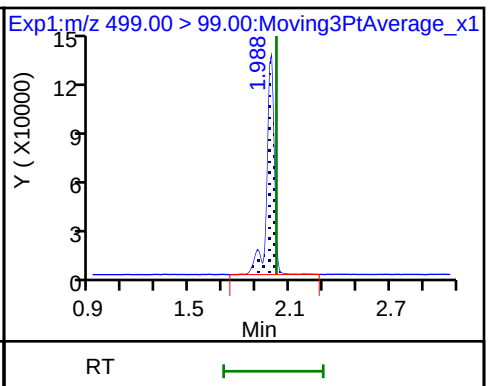
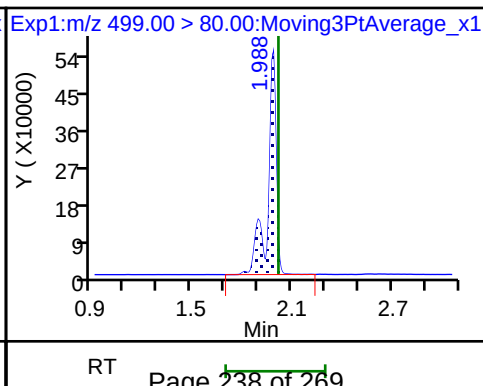
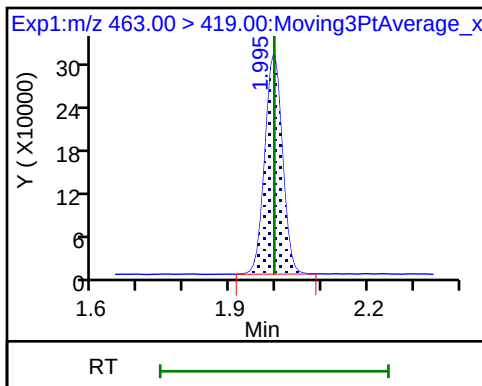
## \* 7 13C4 PFOS



## 9 Perfluorononanoic acid

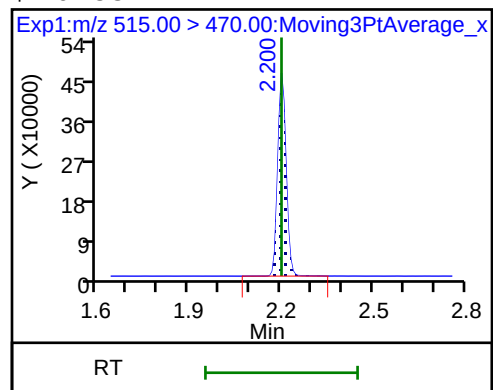
## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid





\$ 10 13C2 PFDA



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: MB 320-237969/1-A  
 Matrix: Water Lab File ID: 2018.08.07\_537C\_023.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24  
 Sample wt/vol: 250 (mL) Date Analyzed: 08/08/2018 04:40  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238610 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 40  | 16  | 6.8 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 8.0    | U | 20  | 8.0 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 8.0 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 30  | 12  | 5.5 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 4.0    | U | 10  | 4.0 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 36     | U | 90  | 36  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 90   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 95   |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_023.d  
 Lims ID: MB 320-237969/1-A  
 Client ID:  
 Sample Type: MB  
 Inject. Date: 08-Aug-2018 04:40:58 ALS Bottle#: 12 Worklist Smp#: 3  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: mb 320-237969/1-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Signal          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits) | S/N   | Flags |
|-----------------|-------|-----------|-----------|-----------|----------|-----------------|---------------|-------|-------|
| \$ 2 13C2 PFHxA |       |           |           |           |          |                 |               |       |       |
| 315.00 > 270.00 | 1.464 | 1.464     | 0.0       | 1.000     | 1298940  | 9.02            |               | 12322 |       |
| * 6 13C2-PFOA   |       |           |           |           |          |                 |               |       |       |
| 415.00 > 370.00 | 1.760 | 1.760     | 0.0       |           | 1310053  | 10.0            |               | 7352  |       |
| * 7 13C4 PFOS   |       |           |           |           |          |                 |               |       |       |
| 503.00 > 80.00  | 1.995 | 1.988     | 0.007     |           | 2893199  | 28.7            |               | 3463  |       |
| \$ 10 13C2 PFDA |       |           |           |           |          |                 |               |       |       |
| 515.00 > 470.00 | 2.208 | 2.208     | 0.0       | 1.000     | 1015055  | 9.46            |               | 7319  |       |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_023.d

Injection Date: 08-Aug-2018 04:40:58

Instrument ID: A8\_N

Lims ID: MB 320-237969/1-A

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 12

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

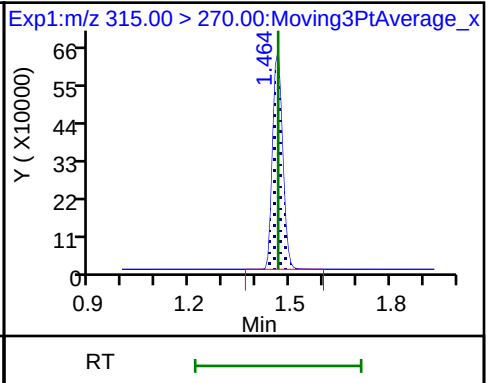
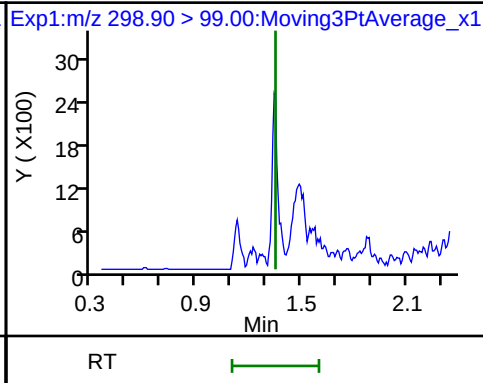
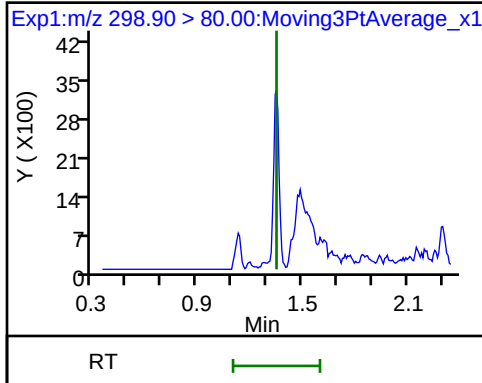
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

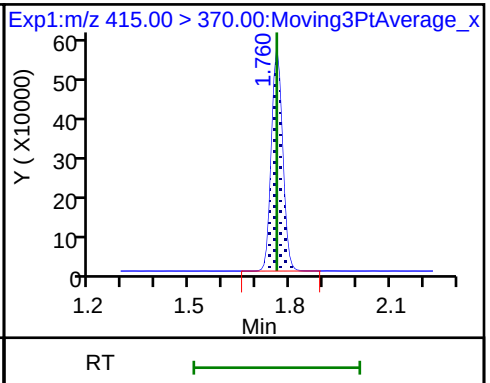
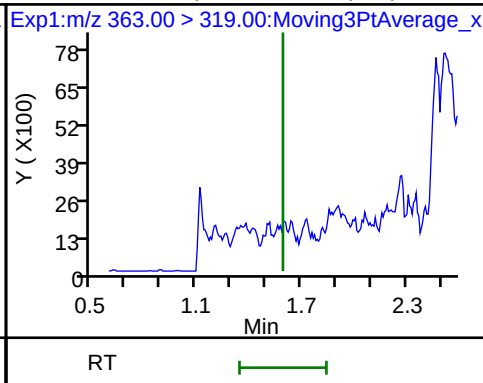
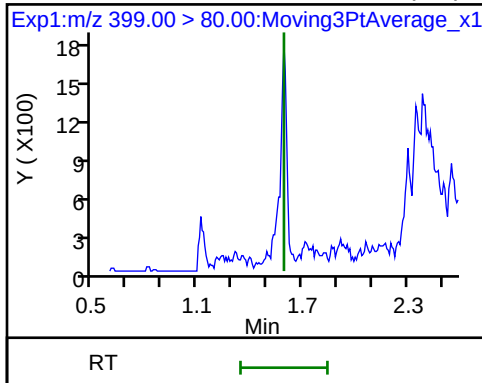
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

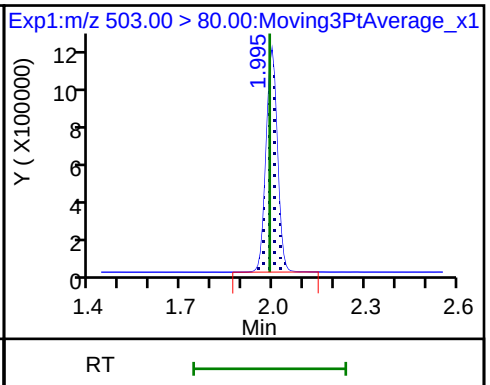
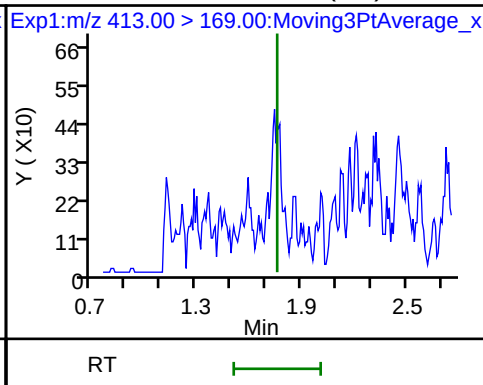
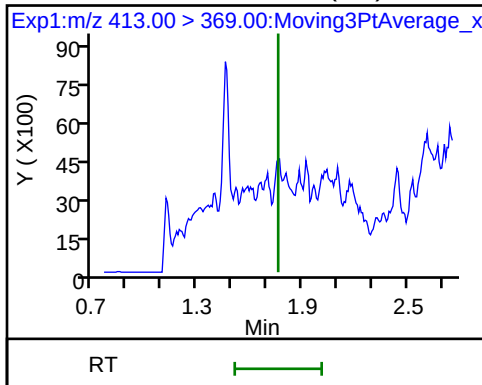
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

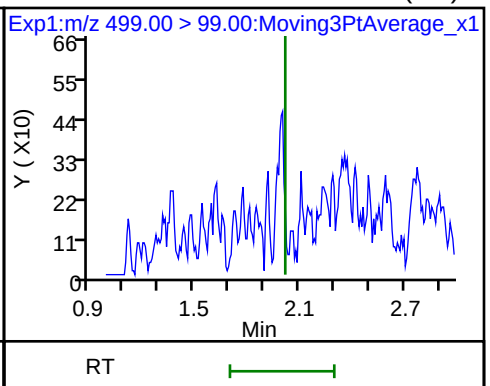
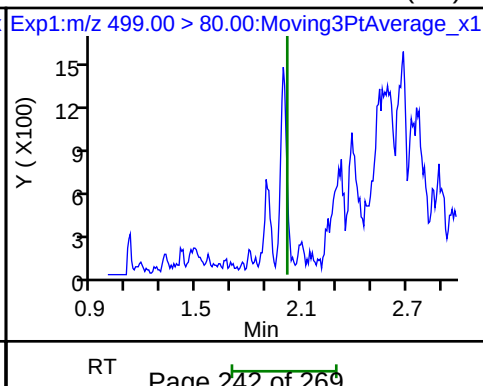
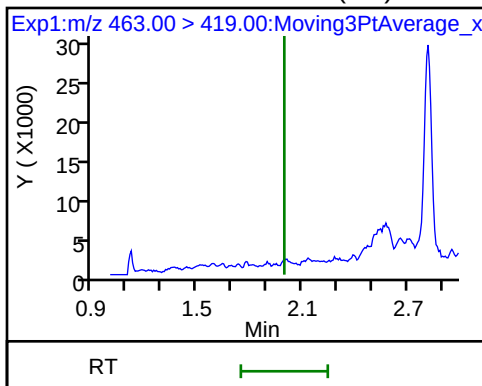
\* 7 13C4 PFOS



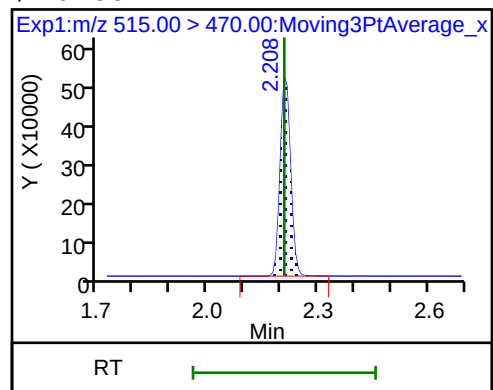
9 Perfluorononanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

8 Perfluorooctane sulfonic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_023.d  
Lims ID: MB 320-237969/1-A  
Client ID:  
Sample Type: MB  
Inject. Date: 08-Aug-2018 04:40:58 ALS Bottle#: 12 Worklist Smp#: 3  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: mb 320-237969/1-a  
Misc. Info.: Plate: 1 Rack: 2  
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 :

Det: EXP1

Process Host: XAWRK002

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 9.02             | 90.17  |
| \$ 10 13C2 PFDA | 10.0         | 9.46             | 94.62  |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: LCS 320-237969/2-A  
 Matrix: Water Lab File ID: 2018.08.07\_537C\_024.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24  
 Sample wt/vol: 250 (mL) Date Analyzed: 08/08/2018 04:45  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238610 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 138    |   | 40  | 16  | 6.8 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 68.3   |   | 20  | 8.0 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 64.4   |   | 24  | 20  | 8.0 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 107    |   | 30  | 12  | 5.5 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 32.1   |   | 10  | 4.0 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 321    |   | 90  | 36  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 88   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 94   |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_024.d  
 Lims ID: LCS 320-237969/2-A  
 Client ID:  
 Sample Type: LCS  
 Inject. Date: 08-Aug-2018 04:45:39 ALS Bottle#: 13 Worklist Smp#: 4  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: lcs 320-237969/2-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

| Signal                          | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 298.90 > 80.00                  | 1.350 | 1.350  | 0.0    | 1.000  | 9017809  | 80.2         |                 | 7250  |       |
| 298.90 > 99.00                  | 1.350 | 1.350  | 0.0    | 1.000  | 6398898  |              | 1.41(0.00-0.00) | 8061  |       |
| \$ 2 13C2 PFHxA                 |       |        |        |        |          |              |                 |       |       |
| 315.00 > 270.00                 | 1.464 | 1.464  | 0.0    | 1.000  | 1202700  | 8.75         |                 | 11593 |       |
| 3 Perfluorohexanesulfonic acid  |       |        |        |        |          |              |                 |       |       |
| 399.00 > 80.00                  | 1.593 | 1.593  | 0.0    | 1.000  | 4533918  | 26.8         |                 | 3895  |       |
| 4 Perfluoroheptanoic acid       |       |        |        |        |          |              |                 |       |       |
| 363.00 > 319.00                 | 1.601 | 1.593  | 0.008  | 1.000  | 1077821  | 8.02         |                 | 215   |       |
| * 6 13C2-PFOA                   |       |        |        |        |          |              |                 |       |       |
| 415.00 > 370.00                 | 1.760 | 1.760  | 0.0    |        | 1249637  | 10.0         |                 | 8156  |       |
| 5 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |       |       |
| 413.00 > 369.00                 | 1.760 | 1.760  | 0.0    | 1.000  | 2336196  | 17.1         |                 | 351   |       |
| 413.00 > 169.00                 | 1.760 | 1.760  | 0.0    | 1.000  | 1183566  |              | 1.97(0.00-0.00) | 2916  |       |
| * 7 13C4 PFOS                   |       |        |        |        |          |              |                 |       |       |
| 503.00 > 80.00                  | 1.995 | 1.988  | 0.007  |        | 2724470  | 28.7         |                 | 3180  |       |
| 9 Perfluorononanoic acid        |       |        |        |        |          |              |                 |       |       |
| 463.00 > 419.00                 | 2.003 | 1.995  | 0.008  | 1.000  | 1585093  | 16.1         |                 | 167   |       |
| 8 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |       |       |
| 499.00 > 80.00                  | 1.995 | 2.018  | -0.023 | 1.000  | 3569086  | 34.4         |                 | 2171  |       |
| 499.00 > 99.00                  | 1.995 | 2.018  | -0.023 | 1.000  | 754562   |              | 4.73(0.00-0.00) | 1705  |       |
| \$ 10 13C2 PFDA                 |       |        |        |        |          |              |                 |       |       |
| 515.00 > 470.00                 | 2.208 | 2.208  | 0.0    | 1.000  | 961840   | 9.40         |                 | 8332  |       |



## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_024.d

Injection Date: 08-Aug-2018 04:45:39

Instrument ID: A8\_N

Lims ID: LCS 320-237969/2-A

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 13

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

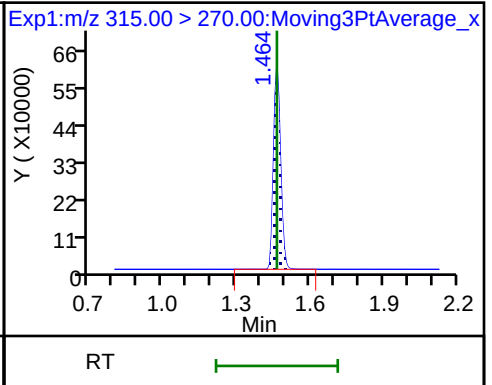
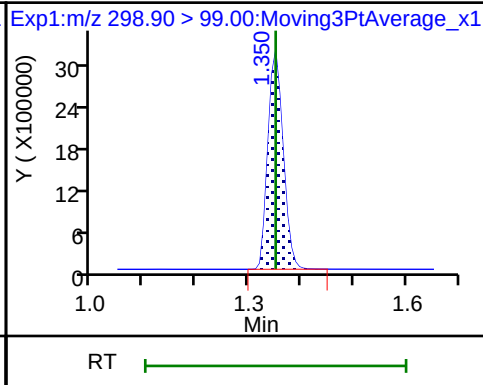
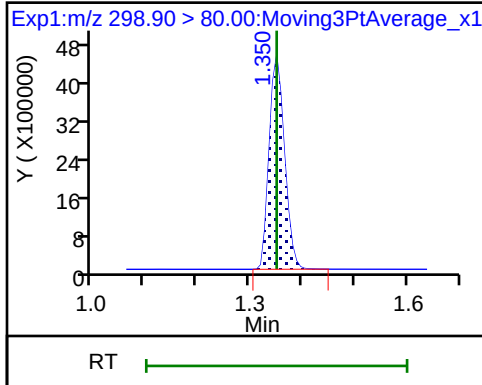
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

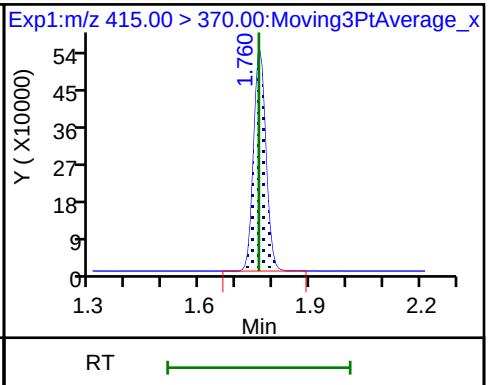
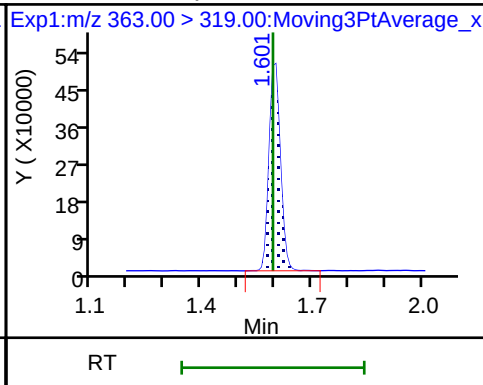
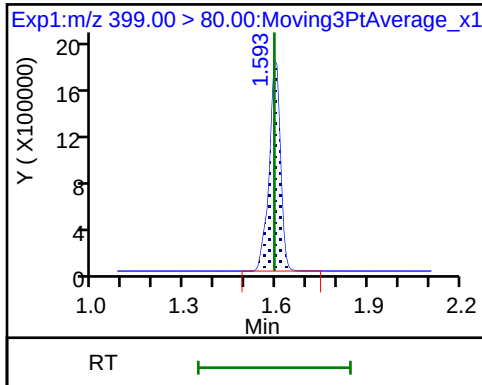
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

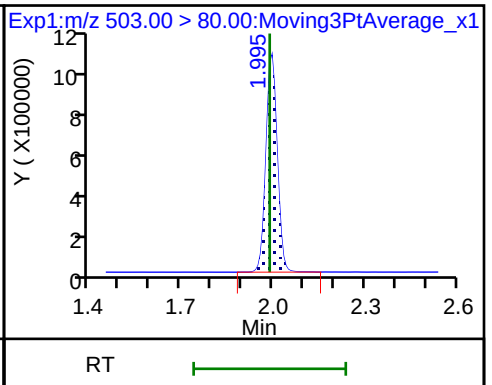
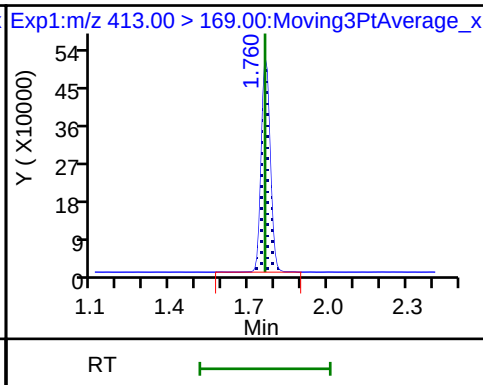
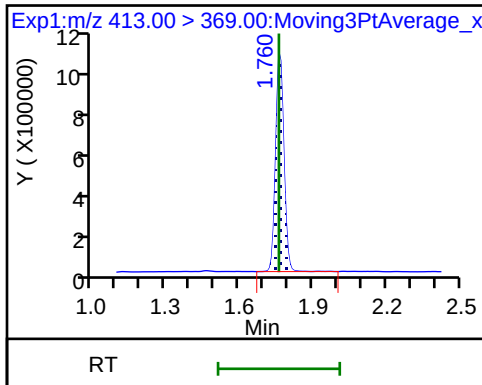
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

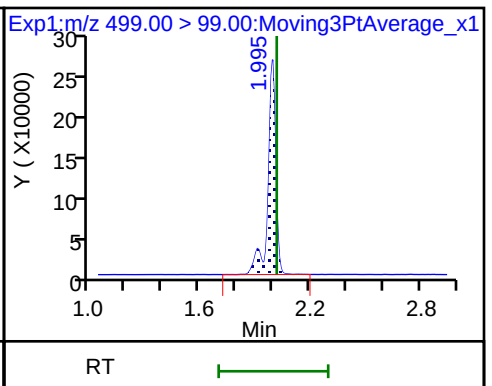
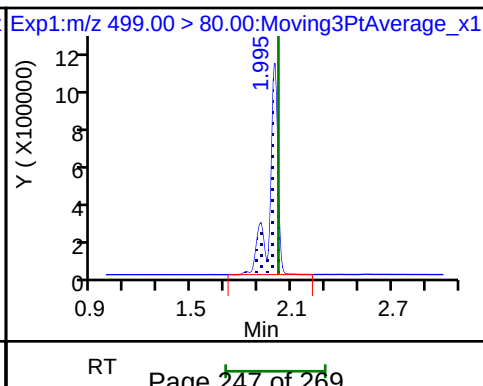
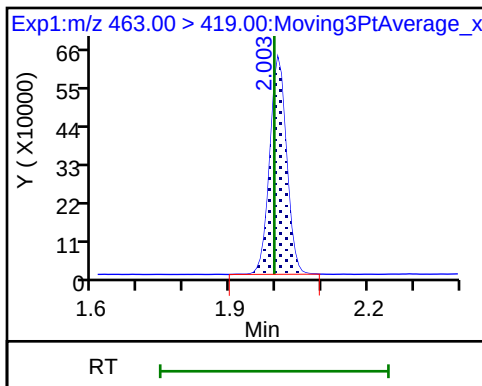
## \* 7 13C4 PFOS



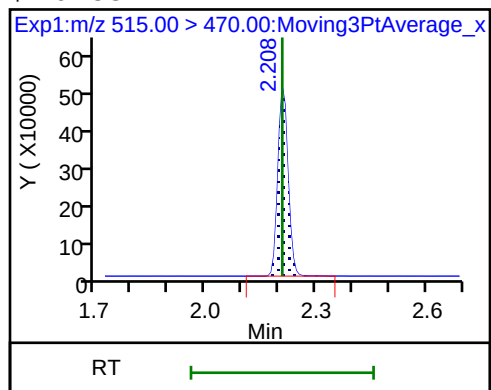
## 9 Perfluorononanoic acid

## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_024.d  
Lims ID: LCS 320-237969/2-A  
Client ID:  
Sample Type: LCS  
Inject. Date: 08-Aug-2018 04:45:39 ALS Bottle#: 13 Worklist Smp#: 4  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: lcs 320-237969/2-a  
Misc. Info.: Plate: 1 Rack: 2  
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
Column 1 : Det: EXP1  
Process Host: XAWRK002

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.75             | 87.53  |
| \$ 10 13C2 PFDA | 10.0         | 9.40             | 94.00  |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                                 |                                              |
|-------------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>         | Job No.: <u>320-41679-1</u>                  |
| SDG No.: _____                                  |                                              |
| Client Sample ID: <u>WGNA-073118-RW-3785 MS</u> | Lab Sample ID: <u>320-41679-1 MS</u>         |
| Matrix: <u>Water</u>                            | Lab File ID: <u>2018.08.07_537C_026.d</u>    |
| Analysis Method: <u>537</u>                     | Date Collected: <u>07/31/2018 08:40</u>      |
| Extraction Method: <u>537</u>                   | Date Extracted: <u>08/04/2018 08:24</u>      |
| Sample wt/vol: <u>250.8 (mL)</u>                | Date Analyzed: <u>08/08/2018 04:55</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>             | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>                 | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                               | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>238610</u>               | Units: <u>ng/L</u>                           |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 146    |   | 40  | 16  | 6.8 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 79.2   |   | 20  | 8.0 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 64.8   |   | 24  | 20  | 8.0 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 118    |   | 30  | 12  | 5.5 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 34.3   |   | 10  | 4.0 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 325    |   | 90  | 36  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 90   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 98   |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_026.d  
 Lims ID: 320-41679-A-1-B MS  
 Client ID: WGNA-073118-RW-3785  
 Sample Type: MS  
 Inject. Date: 08-Aug-2018 04:55:01 ALS Bottle#: 15 Worklist Smp#: 6  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41679-a-1-b ms  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj

Date: 08-Aug-2018 13:44:37

| Signal                          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 298.90 > 80.00                  | 1.350 | 1.350     | 0.0       | 1.000     | 10543306 | 81.5            |                 | 5950  |       |
| 298.90 > 99.00                  | 1.350 | 1.350     | 0.0       | 1.000     | 7391046  |                 | 1.43(0.00-0.00) | 8568  |       |
| \$ 2 13C2 PFHxA                 |       |           |           |           |          |                 |                 |       |       |
| 315.00 > 270.00                 | 1.464 | 1.464     | 0.0       | 1.000     | 1400664  | 8.95            |                 | 12430 |       |
| 3 Perfluorohexanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 399.00 > 80.00                  | 1.593 | 1.593     | 0.0       | 1.000     | 5752218  | 29.5            |                 | 2838  |       |
| 4 Perfluoroheptanoic acid       |       |           |           |           |          |                 |                 |       |       |
| 363.00 > 319.00                 | 1.593 | 1.593     | 0.0       | 1.000     | 1317897  | 8.61            |                 | 206   |       |
| * 6 13C2-PFOA                   |       |           |           |           |          |                 |                 |       |       |
| 415.00 > 370.00                 | 1.760 | 1.760     | 0.0       |           | 1422947  | 10.0            |                 | 7031  |       |
| 5 Perfluorooctanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 413.00 > 369.00                 | 1.760 | 1.760     | 0.0       | 1.000     | 3095446  | 19.9            |                 | 415   |       |
| 413.00 > 169.00                 | 1.760 | 1.760     | 0.0       | 1.000     | 1709563  |                 | 1.81(0.00-0.00) | 3454  |       |
| * 7 13C4 PFOS                   |       |           |           |           |          |                 |                 |       |       |
| 503.00 > 80.00                  | 1.995 | 1.988     | 0.007     |           | 3131824  | 28.7            |                 | 2610  |       |
| 9 Perfluorononanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 463.00 > 419.00                 | 2.003 | 1.995     | 0.008     | 1.000     | 1822800  | 16.3            |                 | 143   |       |
| 8 Perfluorooctane sulfonic acid |       |           |           |           |          |                 |                 |       |       |
| 499.00 > 80.00                  | 1.995 | 2.018     | -0.023    | 1.000     | 4375641  | 36.7            |                 | 1905  |       |
| 499.00 > 99.00                  | 1.995 | 2.018     | -0.023    | 1.000     | 897685   |                 | 4.87(0.00-0.00) | 1533  |       |
| \$ 10 13C2 PFDA                 |       |           |           |           |          |                 |                 |       |       |
| 515.00 > 470.00                 | 2.208 | 2.208     | 0.0       | 1.000     | 1137769  | 9.76            |                 | 10002 |       |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_026.d

Injection Date: 08-Aug-2018 04:55:01

Instrument ID: A8\_N

Lims ID: 320-41679-A-1-B MS

Client ID: WGNA-073118-RW-3785

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 15

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

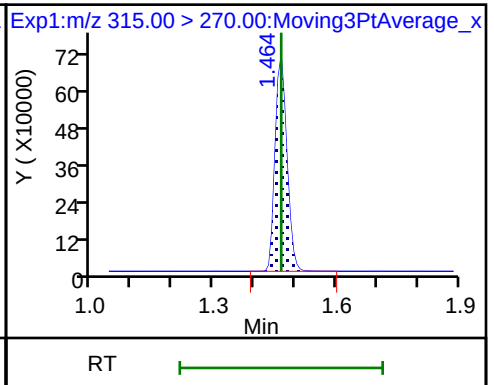
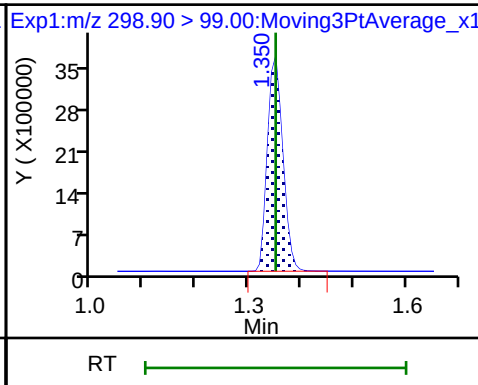
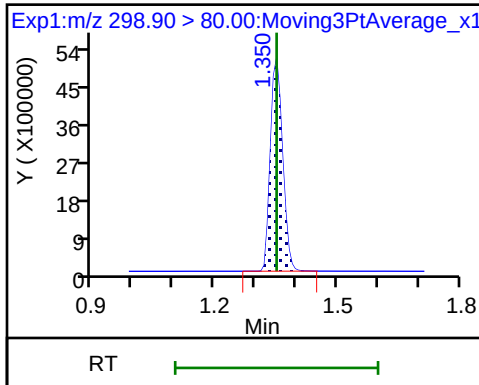
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

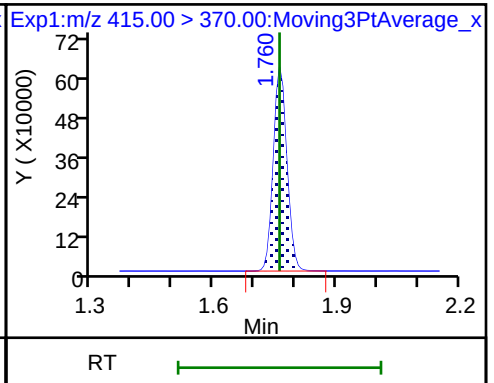
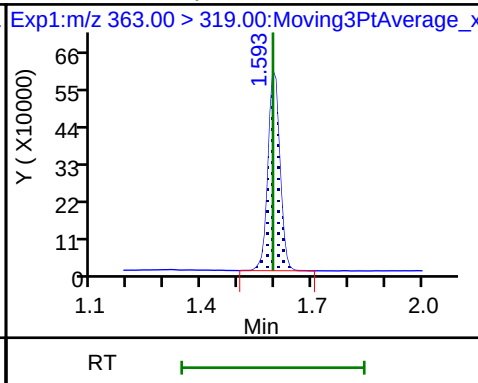
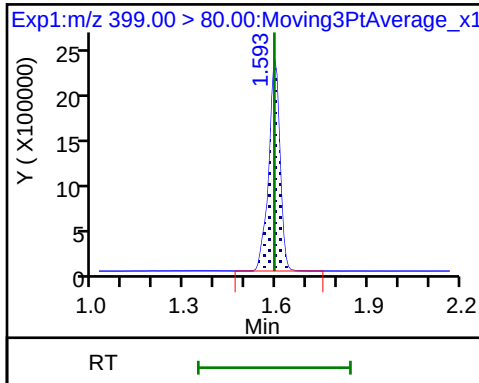
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

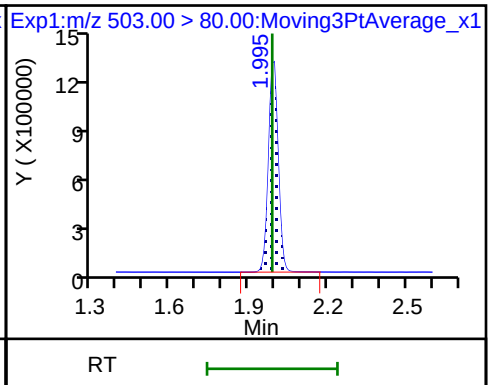
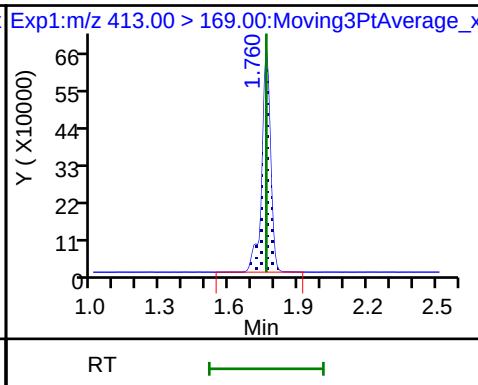
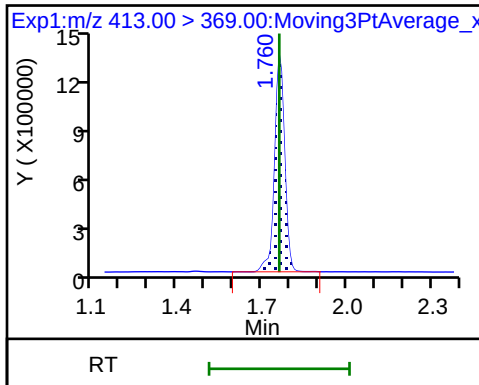
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

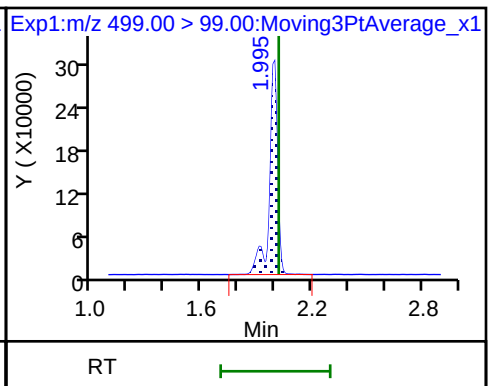
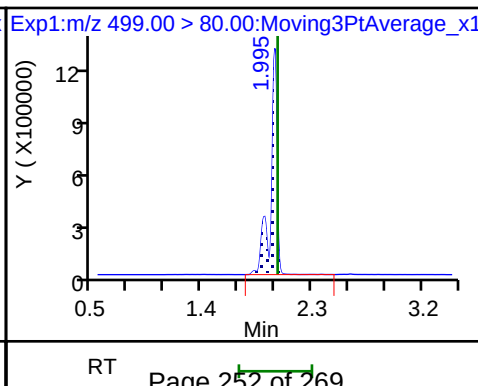
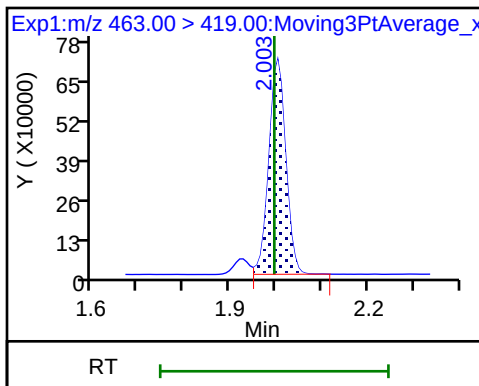
## \* 7 13C4 PFOS



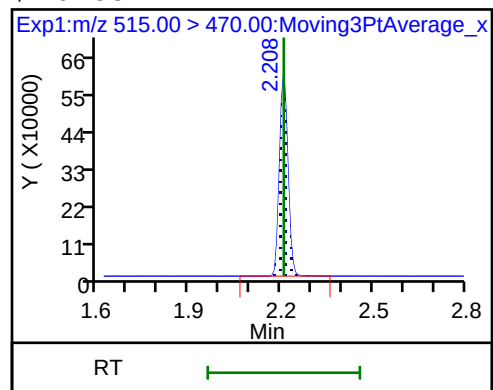
## 9 Perfluorononanoic acid

## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_026.d  
Lims ID: 320-41679-A-1-B MS  
Client ID: WGNA-073118-RW-3785  
Sample Type: MS  
Inject. Date: 08-Aug-2018 04:55:01 ALS Bottle#: 15 Worklist Smp#: 6  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-41679-a-1-b ms  
Misc. Info.: Plate: 1 Rack: 2  
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
Column 1 : Det: EXP1  
Process Host: XAWRK002

First Level Reviewer: barnettj

Date: 08-Aug-2018 13:44:37

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.95             | 89.52  |
| \$ 10 13C2 PFDA | 10.0         | 9.76             | 97.65  |



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                                  |                                              |
|--------------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>          | Job No.: <u>320-41679-1</u>                  |
| SDG No.: _____                                   |                                              |
| Client Sample ID: <u>WGNA-073118-RW-3785 MSD</u> | Lab Sample ID: <u>320-41679-1 MSD</u>        |
| Matrix: <u>Water</u>                             | Lab File ID: <u>2018.08.07_537C_027.d</u>    |
| Analysis Method: <u>537</u>                      | Date Collected: <u>07/31/2018 08:40</u>      |
| Extraction Method: <u>537</u>                    | Date Extracted: <u>08/04/2018 08:24</u>      |
| Sample wt/vol: <u>243.5 (mL)</u>                 | Date Analyzed: <u>08/08/2018 04:59</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>              | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>                  | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                                | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>238610</u>                | Units: <u>ng/L</u>                           |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 151    |   | 41  | 16  | 7.0 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 80.0   |   | 21  | 8.2 | 2.9 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 65.2   |   | 25  | 21  | 8.2 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 120    |   | 31  | 12  | 5.6 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 35.1   |   | 10  | 4.1 | 2.0 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 335    |   | 92  | 37  | 17  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 86   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 99   |   | 70-130 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_027.d  
 Lims ID: 320-41679-A-1-C MSD  
 Client ID: WGNA-073118-RW-3785  
 Sample Type: MSD  
 Inject. Date: 08-Aug-2018 04:59:41 ALS Bottle#: 16 Worklist Smp#: 7  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-41679-a-1-c msd  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK002

First Level Reviewer: barnettj

Date: 08-Aug-2018 13:44:49

| Signal                          | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | S/N   | Flags |
|---------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|-------|-------|
| 1 Perfluorobutanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 298.90 > 80.00                  | 1.350 | 1.350     | 0.0       | 1.000     | 10183775 | 81.5            |                 | 5875  |       |
| 298.90 > 99.00                  | 1.350 | 1.350     | 0.0       | 1.000     | 7032810  |                 | 1.45(0.00-0.00) | 7802  |       |
| \$ 2 13C2 PFHxA                 |       |           |           |           |          |                 |                 |       |       |
| 315.00 > 270.00                 | 1.464 | 1.464     | 0.0       | 1.000     | 1335663  | 8.61            |                 | 11154 |       |
| 3 Perfluorohexanesulfonic acid  |       |           |           |           |          |                 |                 |       |       |
| 399.00 > 80.00                  | 1.593 | 1.593     | 0.0       | 1.000     | 5509027  | 29.3            |                 | 2769  |       |
| 4 Perfluoroheptanoic acid       |       |           |           |           |          |                 |                 |       |       |
| 363.00 > 319.00                 | 1.593 | 1.593     | 0.0       | 1.000     | 1298045  | 8.56            |                 | 204   |       |
| * 6 13C2-PFOA                   |       |           |           |           |          |                 |                 |       |       |
| 415.00 > 370.00                 | 1.760 | 1.760     | 0.0       |           | 1410294  | 10.0            |                 | 9769  |       |
| 5 Perfluorooctanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 413.00 > 369.00                 | 1.760 | 1.760     | 0.0       | 1.000     | 3010558  | 19.5            |                 | 390   |       |
| 413.00 > 169.00                 | 1.760 | 1.760     | 0.0       | 1.000     | 1685224  |                 | 1.79(0.00-0.00) | 3697  |       |
| * 7 13C4 PFOS                   |       |           |           |           |          |                 |                 |       |       |
| 503.00 > 80.00                  | 1.988 | 1.988     | 0.0       |           | 3025296  | 28.7            |                 | 2604  |       |
| 9 Perfluorononanoic acid        |       |           |           |           |          |                 |                 |       |       |
| 463.00 > 419.00                 | 2.003 | 1.995     | 0.008     | 1.000     | 1765719  | 15.9            |                 | 136   |       |
| 8 Perfluorooctane sulfonic acid |       |           |           |           |          |                 |                 |       |       |
| 499.00 > 80.00                  | 1.988 | 2.018     | -0.030    | 1.000     | 4242044  | 36.8            |                 | 1965  |       |
| 499.00 > 99.00                  | 1.988 | 2.018     | -0.030    | 1.000     | 888278   |                 | 4.78(0.00-0.00) | 1445  |       |
| \$ 10 13C2 PFDA                 |       |           |           |           |          |                 |                 |       |       |
| 515.00 > 470.00                 | 2.208 | 2.208     | 0.0       | 1.000     | 1140508  | 9.88            |                 | 9949  |       |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_027.d

Injection Date: 08-Aug-2018 04:59:41

Instrument ID: A8\_N

Lims ID: 320-41679-A-1-C MSD

Client ID: WGNA-073118-RW-3785

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 16

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

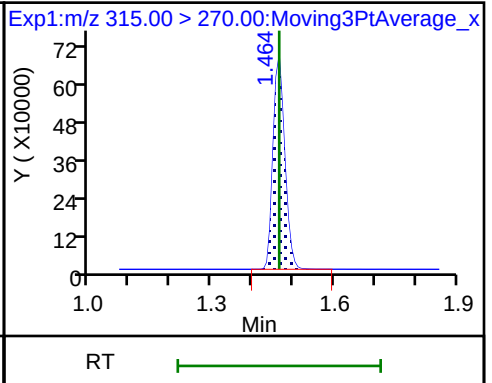
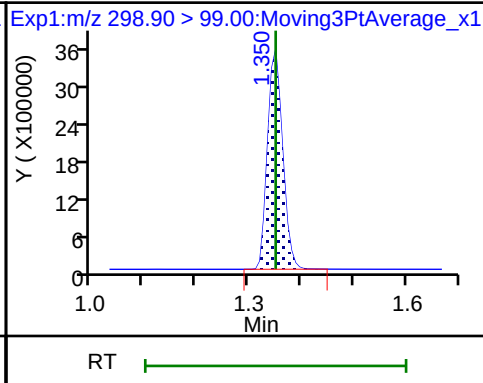
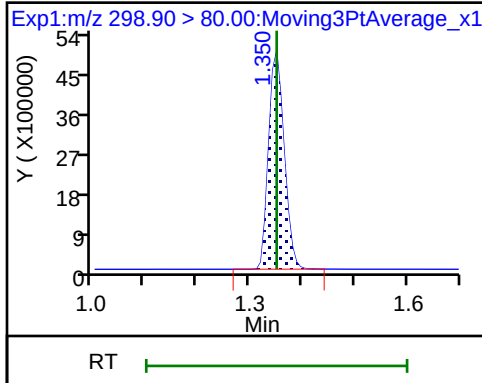
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

## 1 Perfluorobutanesulfonic acid

## 1 Perfluorobutanesulfonic acid

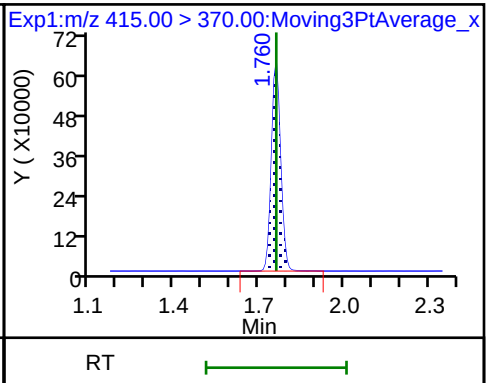
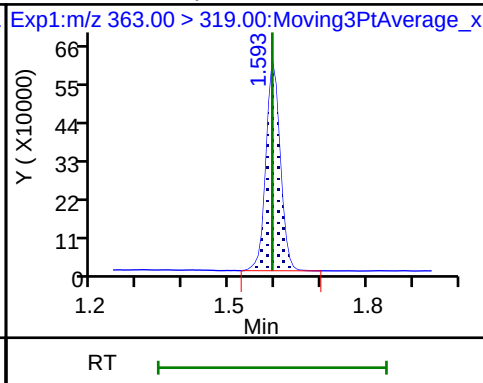
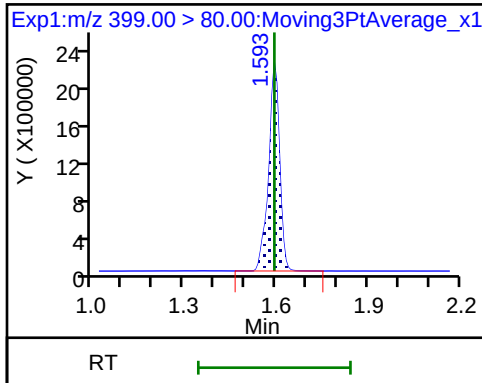
## \$ 2 13C2 PFHxA



## 3 Perfluorohexanesulfonic acid

## 4 Perfluoroheptanoic acid

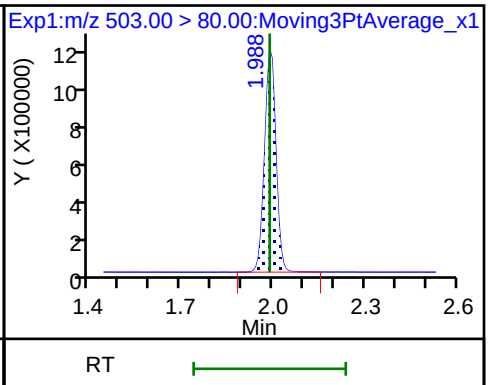
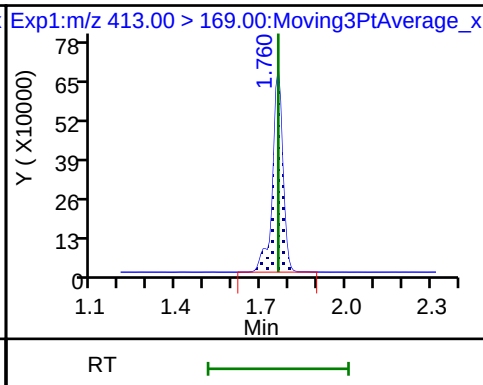
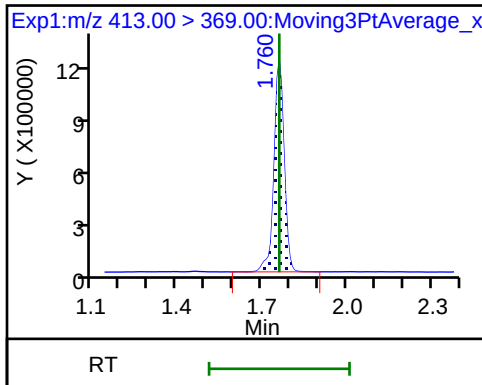
## \* 6 13C2-PFOA



## 5 Perfluorooctanoic acid

## 5 Perfluorooctanoic acid

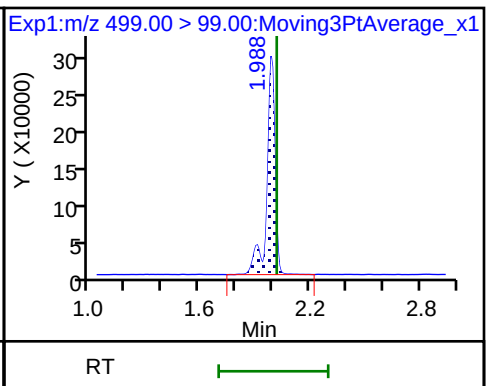
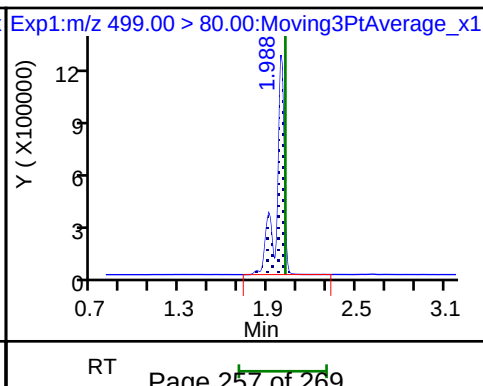
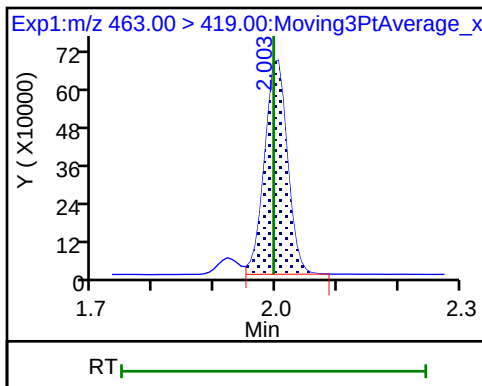
## \* 7 13C4 PFOS



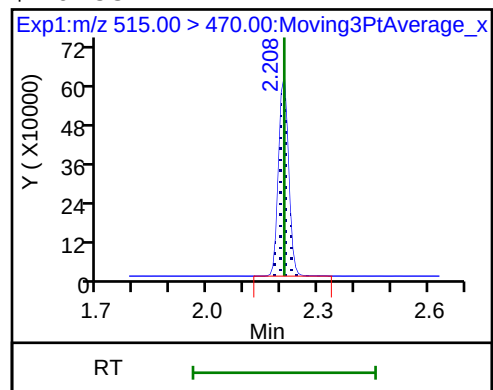
## 9 Perfluorononanoic acid

## 8 Perfluorooctane sulfonic acid

## 8 Perfluorooctane sulfonic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\2018.08.07\_537C\_027.d  
Lims ID: 320-41679-A-1-C MSD  
Client ID: WGNA-073118-RW-3785  
Sample Type: MSD  
Inject. Date: 08-Aug-2018 04:59:41 ALS Bottle#: 16 Worklist Smp#: 7  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Sample Info: 320-41679-a-1-c msd  
Misc. Info.: Plate: 1 Rack: 2  
Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8\_N  
Method: \\ChromNa\Sacramento\ChromData\A8\_N\20180807-62321.b\537\_A8\_N.m  
Limit Group: LC 537 ICAL  
Last Update: 08-Aug-2018 13:53:59 Calib Date: 07-Aug-2018 13:07:25  
Integrator: Picker  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20180807-62276.b\2018.08.07\_537CURVE\_008.d  
Column 1 : Det: EXP1  
Process Host: XAWRK002

First Level Reviewer: barnettj

Date: 08-Aug-2018 13:44:49

| Compound        | Amount Added | Amount Recovered | % Rec. |
|-----------------|--------------|------------------|--------|
| \$ 2 13C2 PFHxA | 10.0         | 8.61             | 86.13  |
| \$ 10 13C2 PFDA | 10.0         | 9.88             | 98.76  |

## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-41679-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_NStart Date: 08/07/2018 12:44Analysis Batch Number: 238469End Date: 08/07/2018 13:26

| LAB SAMPLE ID             | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID                   | COLUMN ID             |
|---------------------------|------------------|------------------|--------------------|-------------------------------|-----------------------|
| IC 320-238469/2           |                  | 08/07/2018 12:44 | 1                  | 2018.08.07_537C<br>URVE 003.d | GeminiC18 3x100 3(mm) |
| IC 320-238469/3           |                  | 08/07/2018 12:48 | 1                  | 2018.08.07_537C<br>URVE 004.d | GeminiC18 3x100 3(mm) |
| IC 320-238469/4           |                  | 08/07/2018 12:53 | 1                  | 2018.08.07_537C<br>URVE 005.d | GeminiC18 3x100 3(mm) |
| IC 320-238469/5<br>ICISAV |                  | 08/07/2018 12:58 | 1                  | 2018.08.07_537C<br>URVE 006.d | GeminiC18 3x100 3(mm) |
| IC 320-238469/6           |                  | 08/07/2018 13:02 | 1                  | 2018.08.07_537C<br>URVE 007.d | GeminiC18 3x100 3(mm) |
| IC 320-238469/7           |                  | 08/07/2018 13:07 | 1                  | 2018.08.07_537C<br>URVE 008.d | GeminiC18 3x100 3(mm) |
| ZZZZZ                     |                  | 08/07/2018 13:12 | 1                  |                               | GeminiC18 3x100 3(mm) |
| CCVL 320-238469/9         |                  | 08/07/2018 13:16 | 1                  | 2018.08.07_537C<br>URVE 010.d | GeminiC18 3x100 3(mm) |
| ICB 320-238469/10         |                  | 08/07/2018 13:21 | 1                  |                               | GeminiC18 3x100 3(mm) |
| ICV 320-238469/11         |                  | 08/07/2018 13:26 | 1                  | 2018.08.07_537C<br>URVE 012.d | GeminiC18 3x100 3(mm) |

## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-41679-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_NStart Date: 08/08/2018 04:31Analysis Batch Number: 238610End Date: 08/08/2018 05:27

| LAB SAMPLE ID              | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID              | COLUMN ID             |
|----------------------------|------------------|------------------|--------------------|--------------------------|-----------------------|
| CCV 320-238610/1<br>CCVIS  |                  | 08/08/2018 04:31 | 1                  | 2018.08.07_537C<br>021.d | GeminiC18 3x100 3(mm) |
| ZZZZZ                      |                  | 08/08/2018 04:36 | 1                  |                          | GeminiC18 3x100 3(mm) |
| MB 320-237969/1-A          |                  | 08/08/2018 04:40 | 1                  | 2018.08.07_537C<br>023.d | GeminiC18 3x100 3(mm) |
| LCS 320-237969/2-A         |                  | 08/08/2018 04:45 | 1                  | 2018.08.07_537C<br>024.d | GeminiC18 3x100 3(mm) |
| 320-41679-1                |                  | 08/08/2018 04:50 | 1                  | 2018.08.07_537C<br>025.d | GeminiC18 3x100 3(mm) |
| 320-41679-1 MS             |                  | 08/08/2018 04:55 | 1                  | 2018.08.07_537C<br>026.d | GeminiC18 3x100 3(mm) |
| 320-41679-1 MSD            |                  | 08/08/2018 04:59 | 1                  | 2018.08.07_537C<br>027.d | GeminiC18 3x100 3(mm) |
| 320-41679-2                |                  | 08/08/2018 05:04 | 1                  | 2018.08.07_537C<br>028.d | GeminiC18 3x100 3(mm) |
| 320-41679-3                |                  | 08/08/2018 05:09 | 1                  | 2018.08.07_537C<br>029.d | GeminiC18 3x100 3(mm) |
| 320-41679-4                |                  | 08/08/2018 05:13 | 1                  | 2018.08.07_537C<br>030.d | GeminiC18 3x100 3(mm) |
| 320-41679-5                |                  | 08/08/2018 05:18 | 1                  | 2018.08.07_537C<br>031.d | GeminiC18 3x100 3(mm) |
| 320-41679-6                |                  | 08/08/2018 05:23 | 1                  | 2018.08.07_537C<br>032.d | GeminiC18 3x100 3(mm) |
| CCV 320-238610/13<br>CCVIS |                  | 08/08/2018 05:27 | 1                  | 2018.08.07_537C<br>033.d | GeminiC18 3x100 3(mm) |

## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Start Date: 08/08/2018 05:27Analysis Batch Number: 238612 End Date: 08/08/2018 06:05

| LAB SAMPLE ID              | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID              | COLUMN ID             |
|----------------------------|------------------|------------------|--------------------|--------------------------|-----------------------|
| CCV 320-238612/13<br>CCVIS |                  | 08/08/2018 05:27 | 1                  | 2018.08.07_537C<br>033.d | GeminiC18 3x100 3(mm) |
| ZZZZZ                      |                  | 08/08/2018 05:32 | 1                  |                          | GeminiC18 3x100 3(mm) |
| 320-41679-7                |                  | 08/08/2018 05:37 | 1                  | 2018.08.07_537C<br>035.d | GeminiC18 3x100 3(mm) |
| 320-41679-8                |                  | 08/08/2018 05:41 | 1                  | 2018.08.07_537C<br>036.d | GeminiC18 3x100 3(mm) |
| 320-41679-9                |                  | 08/08/2018 05:46 | 1                  | 2018.08.07_537C<br>037.d | GeminiC18 3x100 3(mm) |
| 320-41679-10               |                  | 08/08/2018 05:51 | 1                  | 2018.08.07_537C<br>038.d | GeminiC18 3x100 3(mm) |
| 320-41679-11               |                  | 08/08/2018 05:55 | 1                  | 2018.08.07_537C<br>039.d | GeminiC18 3x100 3(mm) |
| 320-41679-12               |                  | 08/08/2018 06:00 | 1                  | 2018.08.07_537C<br>040.d | GeminiC18 3x100 3(mm) |
| CCV 320-238612/21<br>CCVIS |                  | 08/08/2018 06:05 | 1                  | 2018.08.07_537C<br>041.d | GeminiC18 3x100 3(mm) |



## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Start Date: 08/08/2018 03:07Analysis Batch Number: 238776 End Date: 08/08/2018 03:44

| LAB SAMPLE ID             | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID              | COLUMN ID             |
|---------------------------|------------------|------------------|--------------------|--------------------------|-----------------------|
| CCVL 320-238776/1         |                  | 08/08/2018 03:07 | 1                  | 2018.08.07_537C<br>003.d | GeminiC18 3x100 3(mm) |
| CCV 320-238776/9<br>CCVIS |                  | 08/08/2018 03:44 | 1                  |                          | GeminiC18 3x100 3(mm) |

## LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

Batch Number: 237969 Batch Start Date: 08/04/18 08:23 Batch Analyst: Kouchari, ShamiranBatch Method: 537 Batch End Date: 08/06/18 16:10

| Lab Sample ID    | Client Sample ID     | Method Chain | Basis | GrossWeight | TareWeight | InitialAmount | FinalAmount | ReceivedpH | LC537-IS 00077 |
|------------------|----------------------|--------------|-------|-------------|------------|---------------|-------------|------------|----------------|
| MB 320-237969/1  |                      | 537, 537     |       |             |            | 250 mL        | 1.00 mL     | 7 SU       | 100 uL         |
| LCS 320-237969/2 |                      | 537, 537     |       |             |            | 250 mL        | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-1    | WGNA-073118-RW-3785  | 537, 537     | T     | 268.98 g    | 28.72 g    | 240.3 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-1    | WGNA-073118-RW-3785  | 537, 537     | T     | 280.33 g    | 29.49 g    | 250.8 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-1    | WGNA-073118-RW-3785  | 537, 537     | T     | 272.17 g    | 28.72 g    | 243.5 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-2    | WGNA-073118-FRB-3785 | 537, 537     | T     | 290.25 g    | 28.58 g    | 261.7 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-3    | NAWC-073118-RW-154   | 537, 537     | T     | 283.01 g    | 28.71 g    | 254.3 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-4    | NAWC-073118-FRB-154  | 537, 537     | T     | 286.19 g    | 28.51 g    | 257.7 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-5    | NAWC-073118-RW-185   | 537, 537     | T     | 294.61 g    | 28.72 g    | 265.9 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-6    | NAWC-073118-FRB-185  | 537, 537     | T     | 273.79 g    | 29.21 g    | 244.6 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-7    | NAWC-073118-RW-179   | 537, 537     | T     | 287.71 g    | 29.85 g    | 257.9 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-8    | NAWC-073118-FRB-179  | 537, 537     | T     | 283.90 g    | 31.05 g    | 252.9 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-9    | NAWC-073118-RW-124   | 537, 537     | T     | 283.41 g    | 29.69 g    | 253.7 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-10   | NAWC-073118-FRB-124  | 537, 537     | T     | 283.12 g    | 28.63 g    | 254.5 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-11   | WGNA-073118-RW-3103  | 537, 537     | T     | 288.10 g    | 28.95 g    | 259.2 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-12   | WGNA-073118-FRB-3103 | 537, 537     | T     | 289.49 g    | 28.81 g    | 260.7 mL      | 1.00 mL     | 7 SU       | 100 uL         |

| Lab Sample ID    | Client Sample ID    | Method Chain | Basis | LC537-MSP 00033 | LC537-SU 00074 | AnalysisComment |  |  |  |
|------------------|---------------------|--------------|-------|-----------------|----------------|-----------------|--|--|--|
| MB 320-237969/1  |                     | 537, 537     |       |                 | 100 uL         | Chlorine, ND    |  |  |  |
| LCS 320-237969/2 |                     | 537, 537     |       | 100 uL          | 100 uL         | Chlorine, ND    |  |  |  |
| 320-41679-A-1    | WGNA-073118-RW-3785 | 537, 537     | T     |                 | 100 uL         | Chlorine, ND    |  |  |  |
| 320-41679-A-1    | WGNA-073118-RW-3785 | 537, 537     | T     | 100 uL          | 100 uL         | Chlorine, ND    |  |  |  |

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

## LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

Batch Number: 237969 Batch Start Date: 08/04/18 08:23 Batch Analyst: Kouchari, ShamiranBatch Method: 537 Batch End Date: 08/06/18 16:10

| Lab Sample ID        | Client Sample ID         | Method Chain | Basis | LC537-MSP 00033 | LC537-SU 00074 | AnalysisComment                                      |  |  |  |
|----------------------|--------------------------|--------------|-------|-----------------|----------------|------------------------------------------------------|--|--|--|
| 320-41679-A-1<br>MSD | WGNA-073118-RW-3<br>785  | 537, 537     | T     | 100 uL          | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-2        | WGNA-073118-FRB-<br>3785 | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-3        | NAWC-073118-RW-1<br>54   | 537, 537     | T     |                 | 100 uL         | Chlorine, ND.<br>Yellow color<br>after<br>extraction |  |  |  |
| 320-41679-A-4        | NAWC-073118-FRB-<br>154  | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-5        | NAWC-073118-RW-1<br>85   | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-6        | NAWC-073118-FRB-<br>185  | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-7        | NAWC-073118-RW-1<br>79   | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-8        | NAWC-073118-FRB-<br>179  | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-9        | NAWC-073118-RW-1<br>24   | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-10       | NAWC-073118-FRB-<br>124  | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-11       | WGNA-073118-RW-3<br>103  | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-12       | WGNA-073118-FRB-<br>3103 | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

## LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

Batch Number: 237969 Batch Start Date: 08/04/18 08:23 Batch Analyst: Kouchari, ShamiranBatch Method: 537 Batch End Date: 08/06/18 16:10

| Batch Notes                          |                                            |
|--------------------------------------|--------------------------------------------|
| Analyst ID - Aliquot Step            | SKD                                        |
| Batch Comment                        | Client labels match TA label, SKD 08/04/18 |
| Analyst ID - Concentration           | SKD                                        |
| Analyst ID - Final Volume Step       | SKD                                        |
| Internal Standard ID#                | 1303558                                    |
| Manifold ID                          | 1, 3                                       |
| Methanol ID                          | 1319281                                    |
| pH Indicator ID                      | 0818                                       |
| Pipette ID                           | R40536G, I46345G                           |
| Analyst ID - IS Reagent Drop         | SKD                                        |
| Analyst ID - IS Reagent Drop Witness | TWL                                        |
| Analyst ID - SU Reagent Drop         | SKD                                        |
| Analyst ID - SU Reagent Drop Witness | VPM                                        |
| Analyst ID - TA Reagent Drop         | SKD                                        |
| Analyst ID - TA Reagent Drop Witness | VPM                                        |
| SPE Cartridge Lot ID                 | 6390138-02                                 |
| Trizma ID                            | SLBR5241V                                  |
| Reagent Water ID                     | 08/02/18                                   |

| Basis | Basis Description |
|-------|-------------------|
| T     | Total/NA          |

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

# Shipping and Receiving Documents



## Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-41679-1

**Login Number: 41679**

**List Source: TestAmerica Sacramento**

**List Number: 1**

**Creator: Nelson, Kym D**

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

"WGNA-073118-RW-3785","537","RES","320-41679-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","11","ng/L","J","7.1","DL","","TRG","","","42","LOQ","YES","-99","","240.3","1.00","17",""  
"WGNA-073118-RW-3785","537","RES","320-41679-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","16","ng/L","J","2.9","DL","","TRG","","","21","LOQ","YES","-99","","240.3","1.00","8.3",""  
"WGNA-073118-RW-3785","537","RES","320-41679-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","15","ng/L","J","5.7","DL","","TRG","","","31","LOQ","YES","-99","","240.3","1.00","12",""  
"WGNA-073118-RW-3785","537","RES","320-41679-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","37","ng/L","U","17","DL","","TRG","","","94","LOQ","YES","-99","","240.3","1.00","37",""  
"WGNA-073118-RW-3785","537","RES","320-41679-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","5.9","ng/L","J","2.0","DL","","TRG","","","10","LOQ","YES","-99","","240.3","1.00","4.2",""  
"WGNA-073118-RW-3785","537","RES","320-41679-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","21","ng/L","U","8.3","DL","","TRG","","","25","LOQ","YES","-99","","240.3","1.00","21",""  
"WGNA-073118-RW-3785","537","RES","320-41679-1","TALSAC","STL00993","13C2 PFHxA","37","ng/L","","-99","DL","","SURRE","88","","-99","LOQ","YES","41.6","","240.3","1.00","0",""  
"WGNA-073118-RW-3785","537","RES","320-41679-1","TALSAC","STL00996","13C2 PFDA","43","ng/L","","-99","DL","","SURRE","103","","-99","LOQ","YES","41.6","","240.3","1.00","0",""  
"NAWC-073118-FRB-124","537","RES","320-41679-10","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.7","DL","","TRG","","","39","LOQ","YES","-99","","254.5","1.00","16",""  
"NAWC-073118-FRB-124","537","RES","320-41679-10","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.9","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","254.5","1.00","7.9",""  
"NAWC-073118-FRB-124","537","RES","320-41679-10","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.4","DL","","TRG","","","29","LOQ","YES","-99","","254.5","1.00","12",""  
"NAWC-073118-FRB-124","537","RES","320-41679-10","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U","16","DL","","TRG","","","88","LOQ","YES","-99","","254.5","1.00","35",""  
"NAWC-073118-FRB-124","537","RES","320-41679-10","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.9","ng/L","U","1.9","DL","","TRG","","","9.8","LOQ","YES","-99","","254.5","1.00","3.9",""  
"NAWC-073118-FRB-124","537","RES","320-41679-10","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","7.9","DL","","TRG","","","24","LOQ","YES","-99","","254.5","1.00","20",""  
"NAWC-073118-FRB-124","537","RES","320-41679-10","TALSAC","STL00993","13C2 PFHxA","34","ng/L","","-99","DL","","SURRE","87","","-99","LOQ","YES","39.3","","254.5","1.00","0",""  
"NAWC-073118-FRB-124","537","RES","320-41679-10","TALSAC","STL00996","13C2 PFDA","36","ng/L","","-99","DL","","SURRE","91","","-99","LOQ","YES","39.3","","254.5","1.00","0",""  
"WGNA-073118-RW-3103","537","RES","320-41679-11","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","7.1","ng/L","J","6.6","DL","","TRG","","","39","LOQ","YES","-99","","259.2","1.00","15",""  
"WGNA-073118-RW-3103","537","RES","320-41679-11","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.3","ng/L","J","2.7","DL","","TRG","","","19","LOQ","YES","-99","","259.2","1.00","7.7",""  
"WGNA-073118-RW-3103","537","RES","320-41679-11","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES","-99","","259.2","1.00","12",""  
"WGNA-073118-RW-3103","537","RES","320-41679-11","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U M","16","DL","","TRG","","","87","LOQ","YES","-99","","259.2","1.00","35",""  
"WGNA-073118-RW-3103","537","RES","320-41679-11","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","2.4","ng/L","J M","1.8","DL","","TRG","","","9.6","LOQ","YES","-99","","259.2","1.00","3.9",""  
"WGNA-073118-RW-3103","537","RES","320-41679-11","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U","7.7","DL","","TRG","","","23","LOQ","YES","-99","","259.2","1.00","19",""  
"WGNA-073118-RW-3103","537","RES","320-41679-11","TALSAC","STL00993","13C2 PFHxA","35","ng/L","","-99","DL","","SURRE","90","","-99","LOQ","YES","38.6","","259.2","1.00","0",""  
"WGNA-073118-RW-3103","537","RES","320-41679-11","TALSAC","STL00996","13C2 PFDA","38","ng/L","","-99","DL","","SURRE","99","","-99","LOQ","YES","38.6","","259.2","1.00","0",""  
"WGNA-073118-FRB-3103","537","RES","320-41679-12","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","15","ng/L","U","6.5","DL","","TRG","","","38","LOQ","YES","-99","","260.7","1.00","15",""  
"WGNA-073118-FRB-3103","537","RES","320-41679-12","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.7","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","260.7","1.00","7.7",""  
"WGNA-073118-FRB-3103","537","RES","320-41679-12","TALSAC","355-46-4","Perfluorohexanesulfonic acid



(PFHxS)","12","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES","-99","","","260.7","1.00","12","","  
"WGNA-073118-FRB-3103","537","RES","320-41679-12","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","35","ng/L","U","15","DL","","TRG","","","86","LOQ","YES","-99","","","260.7","1.00","35","","  
"WGNA-073118-FRB-3103","537","RES","320-41679-12","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","3.8","ng/L","U","1.8","DL","","TRG","","","9.6","LOQ","YES","-99","","","260.7","1.00","3.8","","  
"WGNA-073118-FRB-3103","537","RES","320-41679-12","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","19","ng/L","U","7.7","DL","","TRG","","","23","LOQ","YES","-99","","","260.7","1.00","19","","  
"WGNA-073118-FRB-3103","537","RES","320-41679-12","TALSAC","STL00993","13C2  
PFHxA","33","ng/L","","","-99","DL","","SURRE","85","","","-99","LOQ","YES","38.4","","","260.7","1.00","0","","  
"WGNA-073118-FRB-3103","537","RES","320-41679-12","TALSAC","STL00996","13C2  
PFDA","35","ng/L","","","-99","DL","","SURRE","92","","","-99","LOQ","YES","38.4","","","260.7","1.00","0","","  
"WGNA-073118-RW-3785MS","537","RES","320-41679-1MS","TALSAC","1763-23-1","Perfluorooctanesulfonic  
acid (PFOS)","146","ng/L","","","6.8","DL","","SPK","103","","","40","LOQ","YES","131","WGNA-073118-RW-  
3785","250.8","1.00","16","","  
"WGNA-073118-RW-3785MS","537","RES","320-41679-1MS","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","79.2","ng/L","","","2.8","DL","","SPK","97","","","20","LOQ","YES","65.8","WGNA-073118-RW-  
3785","250.8","1.00","8.0","","  
"WGNA-073118-RW-3785MS","537","RES","320-41679-1MS","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","118","ng/L","","","5.5","DL","","SPK","103","","","30","LOQ","YES","99.8","WGNA-073118-RW-  
3785","250.8","1.00","12","","  
"WGNA-073118-RW-3785MS","537","RES","320-41679-1MS","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","325","ng/L","","","16","DL","","SPK","109","","","90","LOQ","YES","299","WGNA-073118-RW-  
3785","250.8","1.00","36","","  
"WGNA-073118-RW-3785MS","537","RES","320-41679-1MS","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","34.3","ng/L","","","1.9","DL","","SPK","89","","","10","LOQ","YES","31.9","WGNA-073118-RW-  
3785","250.8","1.00","4.0","","  
"WGNA-073118-RW-3785MS","537","RES","320-41679-1MS","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","64.8","ng/L","","","8.0","DL","","SPK","99","","","24","LOQ","YES","65.8","WGNA-073118-RW-  
3785","250.8","1.00","20","","  
"WGNA-073118-RW-3785MS","537","RES","320-41679-1MS","TALSAC","STL00993","13C2  
PFHxA","35.7","ng/L","","","-99","DL","","SURRE","90","","","-99","LOQ","YES","39.9","WGNA-073118-RW-  
3785","250.8","1.00","0","","  
"WGNA-073118-RW-3785MS","537","RES","320-41679-1MS","TALSAC","STL00996","13C2  
PFDA","38.9","ng/L","","","-99","DL","","SURRE","98","","","-99","LOQ","YES","39.9","WGNA-073118-RW-  
3785","250.8","1.00","0","","  
"WGNA-073118-RW-3785MSD","537","RES","320-41679-1MSD","TALSAC","1763-23-1","Perfluorooctanesulfonic  
acid (PFOS)","151","ng/L","","","7.0","DL","","SPK","104","3","41","LOQ","YES","135","WGNA-073118-RW-  
3785","243.5","1.00","16","","  
"WGNA-073118-RW-3785MSD","537","RES","320-41679-1MSD","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","80.0","ng/L","","","2.9","DL","","SPK","95","1","21","LOQ","YES","67.8","WGNA-073118-RW-  
3785","243.5","1.00","8.2","","  
"WGNA-073118-RW-3785MSD","537","RES","320-41679-1MSD","TALSAC","355-46-4","Perfluorohexanesulfonic  
acid (PFHxS)","120","ng/L","","","5.6","DL","","SPK","103","2","31","LOQ","YES","103","WGNA-073118-RW-  
3785","243.5","1.00","12","","  
"WGNA-073118-RW-3785MSD","537","RES","320-41679-1MSD","TALSAC","375-73-5","Perfluorobutanesulfonic  
acid (PFBS)","335","ng/L","","","17","DL","","SPK","109","3","92","LOQ","YES","308","WGNA-073118-RW-  
3785","243.5","1.00","37","","  
"WGNA-073118-RW-3785MSD","537","RES","320-41679-1MSD","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","35.1","ng/L","","","2.0","DL","","SPK","89","2","10","LOQ","YES","32.9","WGNA-073118-RW-  
3785","243.5","1.00","4.1","","  
"WGNA-073118-RW-3785MSD","537","RES","320-41679-1MSD","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","65.2","ng/L","","","8.2","DL","","SPK","96","1","25","LOQ","YES","67.8","WGNA-073118-RW-  
3785","243.5","1.00","21","","  
"WGNA-073118-RW-3785MSD","537","RES","320-41679-1MSD","TALSAC","STL00993","13C2

PFHxA","35.4","ng/L","",-99","DL","","SURRE","86","",-99","LOQ","YES","41.1","WGNA-073118-RW-3785","243.5","1.00","0",""  
"WGNA-073118-RW-3785MSD","537","RES","320-41679-1MSD","TALSAC","STL00996","13C2  
PFDA","40.6","ng/L","",-99","DL","","SURRE","99","",-99","LOQ","YES","41.1","WGNA-073118-RW-3785","243.5","1.00","0",""  
"WGNA-073118-FRB-3785","537","RES","320-41679-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","15","ng/L","U","6.5","DL","","TRG","","","38","LOQ","YES","-99","","261.7","1.00","15",""  
"WGNA-073118-FRB-3785","537","RES","320-41679-2","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.6","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","261.7","1.00","7.6",""  
"WGNA-073118-FRB-3785","537","RES","320-41679-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","11","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES","-99","","261.7","1.00","11",""  
"WGNA-073118-FRB-3785","537","RES","320-41679-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","34","ng/L","U","15","DL","","TRG","","","86","LOQ","YES","-99","","261.7","1.00","34",""  
"WGNA-073118-FRB-3785","537","RES","320-41679-2","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.8","ng/L","U","1.8","DL","","TRG","","","9.6","LOQ","YES","-99","","261.7","1.00","3.8",""  
"WGNA-073118-FRB-3785","537","RES","320-41679-2","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U","7.6","DL","","TRG","","","23","LOQ","YES","-99","","261.7","1.00","19",""  
"WGNA-073118-FRB-3785","537","RES","320-41679-2","TALSAC","STL00993","13C2  
PFHxA","33","ng/L","",-99","DL","","SURRE","86","",-99","LOQ","YES","38.2","","261.7","1.00","0",""  
"WGNA-073118-FRB-3785","537","RES","320-41679-2","TALSAC","STL00996","13C2  
PFDA","37","ng/L","",-99","DL","","SURRE","97","",-99","LOQ","YES","38.2","","261.7","1.00","0",""  
"NAWC-073118-RW-154","537","RES","320-41679-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","17","ng/L","J","6.7","DL","","TRG","","","39","LOQ","YES","-99","","254.3","1.00","16",""  
"NAWC-073118-RW-154","537","RES","320-41679-3","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","24","ng/L","","2.8","DL","","TRG","","","20","LOQ","YES","-99","","254.3","1.00","7.9",""  
"NAWC-073118-RW-154","537","RES","320-41679-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.4","DL","","TRG","","","29","LOQ","YES","-99","","254.3","1.00","12",""  
"NAWC-073118-RW-154","537","RES","320-41679-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U","16","DL","","TRG","","","88","LOQ","YES","-99","","254.3","1.00","35",""  
"NAWC-073118-RW-154","537","RES","320-41679-3","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","8.9","ng/L","J","1.9","DL","","TRG","","","9.8","LOQ","YES","-99","","254.3","1.00","3.9",""  
"NAWC-073118-RW-154","537","RES","320-41679-3","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","7.9","DL","","TRG","","","24","LOQ","YES","-99","","254.3","1.00","20",""  
"NAWC-073118-RW-154","537","RES","320-41679-3","TALSAC","STL00993","13C2  
PFHxA","32","ng/L","",-99","DL","","SURRE","80","",-99","LOQ","YES","39.3","","254.3","1.00","0",""  
"NAWC-073118-RW-154","537","RES","320-41679-3","TALSAC","STL00996","13C2  
PFDA","37","ng/L","",-99","DL","","SURRE","94","",-99","LOQ","YES","39.3","","254.3","1.00","0",""  
"NAWC-073118-FRB-154","537","RES","320-41679-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.6","DL","","TRG","","","39","LOQ","YES","-99","","257.7","1.00","16",""  
"NAWC-073118-FRB-154","537","RES","320-41679-4","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.8","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","257.7","1.00","7.8",""  
"NAWC-073118-FRB-154","537","RES","320-41679-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES","-99","","257.7","1.00","12",""  
"NAWC-073118-FRB-154","537","RES","320-41679-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U","16","DL","","TRG","","","87","LOQ","YES","-99","","257.7","1.00","35",""  
"NAWC-073118-FRB-154","537","RES","320-41679-4","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.9","ng/L","U","1.8","DL","","TRG","","","9.7","LOQ","YES","-99","","257.7","1.00","3.9",""  
"NAWC-073118-FRB-154","537","RES","320-41679-4","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U","7.8","DL","","TRG","","","23","LOQ","YES","-99","","257.7","1.00","19",""  
"NAWC-073118-FRB-154","537","RES","320-41679-4","TALSAC","STL00993","13C2  
PFHxA","33","ng/L","",-99","DL","","SURRE","86","",-99","LOQ","YES","38.8","","257.7","1.00","0",""  
"NAWC-073118-FRB-154","537","RES","320-41679-4","TALSAC","STL00996","13C2  
PFDA","38","ng/L","",-99","DL","","SURRE","98","",-99","LOQ","YES","38.8","","257.7","1.00","0",""  
"NAWC-073118-RW-185","537","RES","320-41679-5","TALSAC","1763-23-1","Perfluorooctanesulfonic acid

(PFOS)","15","ng/L","J","6.4","DL","","TRG","","","38","LOQ","YES","-99","","265.9","1.00","15",""  
"NAWC-073118-RW-185","537","RES","320-41679-5","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","12","ng/L","J","2.6","DL","","TRG","","","19","LOQ","YES","-99","","265.9","1.00","7.5",""  
"NAWC-073118-RW-185","537","RES","320-41679-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","8.5","ng/L","J","5.2","DL","","TRG","","","28","LOQ","YES","-99","","265.9","1.00","11",""  
"NAWC-073118-RW-185","537","RES","320-41679-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","34","ng/L","U","15","DL","","TRG","","","85","LOQ","YES","-99","","265.9","1.00","34",""  
"NAWC-073118-RW-185","537","RES","320-41679-5","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","8.2","ng/L","J","1.8","DL","","TRG","","","9.4","LOQ","YES","-99","","265.9","1.00","3.8",""  
"NAWC-073118-RW-185","537","RES","320-41679-5","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","19","ng/L","U","7.5","DL","","TRG","","","23","LOQ","YES","-99","","265.9","1.00","19",""  
"NAWC-073118-RW-185","537","RES","320-41679-5","TALSAC","STL00993","13C2  
PFHxA","31","ng/L","","-99","DL","","SURR","81","","-99","LOQ","YES","37.6","","265.9","1.00","0",""  
"NAWC-073118-RW-185","537","RES","320-41679-5","TALSAC","STL00996","13C2  
PFDA","35","ng/L","","-99","DL","","SURR","94","","-99","LOQ","YES","37.6","","265.9","1.00","0",""  
"NAWC-073118-FRB-185","537","RES","320-41679-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","16","ng/L","U","7.0","DL","","TRG","","","41","LOQ","YES","-99","","244.6","1.00","16",""  
"NAWC-073118-FRB-185","537","RES","320-41679-6","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","8.2","ng/L","U","2.9","DL","","TRG","","","20","LOQ","YES","-99","","244.6","1.00","8.2",""  
"NAWC-073118-FRB-185","537","RES","320-41679-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","12","ng/L","U","5.6","DL","","TRG","","","31","LOQ","YES","-99","","244.6","1.00","12",""  
"NAWC-073118-FRB-185","537","RES","320-41679-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","37","ng/L","U","16","DL","","TRG","","","92","LOQ","YES","-99","","244.6","1.00","37",""  
"NAWC-073118-FRB-185","537","RES","320-41679-6","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","4.1","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","244.6","1.00","4.1",""  
"NAWC-073118-FRB-185","537","RES","320-41679-6","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","20","ng/L","U","8.2","DL","","TRG","","","25","LOQ","YES","-99","","244.6","1.00","20",""  
"NAWC-073118-FRB-185","537","RES","320-41679-6","TALSAC","STL00993","13C2  
PFHxA","40","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","40.9","","244.6","1.00","0",""  
"NAWC-073118-FRB-185","537","RES","320-41679-6","TALSAC","STL00996","13C2  
PFDA","42","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","40.9","","244.6","1.00","0",""  
"NAWC-073118-RW-179","537","RES","320-41679-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","17","ng/L","J","6.6","DL","","TRG","","","39","LOQ","YES","-99","","257.9","1.00","16",""  
"NAWC-073118-RW-179","537","RES","320-41679-7","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","21","ng/L","","2.7","DL","","TRG","","","19","LOQ","YES","-99","","257.9","1.00","7.8",""  
"NAWC-073118-RW-179","537","RES","320-41679-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","7.1","ng/L","J","5.3","DL","","TRG","","","29","LOQ","YES","-99","","257.9","1.00","12",""  
"NAWC-073118-RW-179","537","RES","320-41679-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","35","ng/L","U","16","DL","","TRG","","","87","LOQ","YES","-99","","257.9","1.00","35",""  
"NAWC-073118-RW-179","537","RES","320-41679-7","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","6.0","ng/L","J","1.8","DL","","TRG","","","9.7","LOQ","YES","-99","","257.9","1.00","3.9",""  
"NAWC-073118-RW-179","537","RES","320-41679-7","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","19","ng/L","U","7.8","DL","","TRG","","","23","LOQ","YES","-99","","257.9","1.00","19",""  
"NAWC-073118-RW-179","537","RES","320-41679-7","TALSAC","STL00993","13C2  
PFHxA","34","ng/L","","-99","DL","","SURR","87","","-99","LOQ","YES","38.8","","257.9","1.00","0",""  
"NAWC-073118-RW-179","537","RES","320-41679-7","TALSAC","STL00996","13C2  
PFDA","39","ng/L","","-99","DL","","SURR","101","","-99","LOQ","YES","38.8","","257.9","1.00","0",""  
"NAWC-073118-FRB-179","537","RES","320-41679-8","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","16","ng/L","U","6.7","DL","","TRG","","","40","LOQ","YES","-99","","252.9","1.00","16",""  
"NAWC-073118-FRB-179","537","RES","320-41679-8","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","7.9","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","252.9","1.00","7.9",""  
"NAWC-073118-FRB-179","537","RES","320-41679-8","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","12","ng/L","U","5.4","DL","","TRG","","","30","LOQ","YES","-99","","252.9","1.00","12",""  
"NAWC-073118-FRB-179","537","RES","320-41679-8","TALSAC","375-73-5","Perfluorobutanesulfonic acid

(PFBS)","36","ng/L","U","16","DL","","","TRG","","","89","LOQ","YES","-99","","","252.9","1.00","36","","  
"NAWC-073118-FRB-179","537","RES","320-41679-8","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","4.0","ng/L","U","1.9","DL","","","TRG","","","9.9","LOQ","YES","-99","","","252.9","1.00","4.0","","  
"NAWC-073118-FRB-179","537","RES","320-41679-8","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","20","ng/L","U","7.9","DL","","","TRG","","","24","LOQ","YES","-99","","","252.9","1.00","20","","  
"NAWC-073118-FRB-179","537","RES","320-41679-8","TALSAC","STL00993","13C2  
PFHxA","34","ng/L","","","-99","DL","","","SURR","87","","","-99","LOQ","YES","39.5","","","252.9","1.00","0","","  
"NAWC-073118-FRB-179","537","RES","320-41679-8","TALSAC","STL00996","13C2  
PFDA","40","ng/L","","","-99","DL","","","SURR","101","","","-99","LOQ","YES","39.5","","","252.9","1.00","0","","  
"NAWC-073118-RW-124","537","RES","320-41679-9","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","31","ng/L","J","6.7","DL","","","TRG","","","39","LOQ","YES","-99","","","253.7","1.00","16","","  
"NAWC-073118-RW-124","537","RES","320-41679-9","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","20","ng/L","","","2.8","DL","","","TRG","","","20","LOQ","YES","-99","","","253.7","1.00","7.9","","  
"NAWC-073118-RW-124","537","RES","320-41679-9","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","14","ng/L","J","5.4","DL","","","TRG","","","30","LOQ","YES","-99","","","253.7","1.00","12","","  
"NAWC-073118-RW-124","537","RES","320-41679-9","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","35","ng/L","U","16","DL","","","TRG","","","89","LOQ","YES","-99","","","253.7","1.00","35","","  
"NAWC-073118-RW-124","537","RES","320-41679-9","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","4.7","ng/L","J","1.9","DL","","","TRG","","","9.9","LOQ","YES","-99","","","253.7","1.00","3.9","","  
"NAWC-073118-RW-124","537","RES","320-41679-9","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","20","ng/L","U","7.9","DL","","","TRG","","","24","LOQ","YES","-99","","","253.7","1.00","20","","  
"NAWC-073118-RW-124","537","RES","320-41679-9","TALSAC","STL00993","13C2  
PFHxA","33","ng/L","","","-99","DL","","","SURR","83","","","-99","LOQ","YES","39.4","","","253.7","1.00","0","","  
"NAWC-073118-RW-124","537","RES","320-41679-9","TALSAC","STL00996","13C2  
PFDA","37","ng/L","","","-99","DL","","","SURR","94","","","-99","LOQ","YES","39.4","","","253.7","1.00","0","","  
"LCS 320-237969/2-A","537","RES","LCS 320-237969/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","138","ng/L","","","6.8","DL","","","SPK","104","","","40","LOQ","YES","132","","","250","1.00","16","","  
"LCS 320-237969/2-A","537","RES","LCS 320-237969/2-A","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","68.3","ng/L","","","2.8","DL","","","SPK","103","","","20","LOQ","YES","66.0","","","250","1.00","8.0","","  
"LCS 320-237969/2-A","537","RES","LCS 320-237969/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","107","ng/L","","","5.5","DL","","","SPK","107","","","30","LOQ","YES","100","","","250","1.00","12","","  
"LCS 320-237969/2-A","537","RES","LCS 320-237969/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","321","ng/L","","","16","DL","","","SPK","107","","","90","LOQ","YES","300","","","250","1.00","36","","  
"LCS 320-237969/2-A","537","RES","LCS 320-237969/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","32.1","ng/L","","","1.9","DL","","","SPK","100","","","10","LOQ","YES","32.0","","","250","1.00","4.0","","  
"LCS 320-237969/2-A","537","RES","LCS 320-237969/2-A","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","64.4","ng/L","","","8.0","DL","","","SPK","98","","","24","LOQ","YES","66.0","","","250","1.00","20","","  
"LCS 320-237969/2-A","537","RES","LCS 320-237969/2-A","TALSAC","STL00993","13C2  
PFHxA","35.0","ng/L","","","-99","DL","","","SURR","88","","","-99","LOQ","YES","40.0","","","250","1.00","0","","  
"LCS 320-237969/2-A","537","RES","LCS 320-237969/2-A","TALSAC","STL00996","13C2  
PFDA","37.6","ng/L","","","-99","DL","","","SURR","94","","","-99","LOQ","YES","40.0","","","250","1.00","0","","  
"MB 320-237969/1-A","537","RES","MB 320-237969/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid  
(PFOS)","16","ng/L","U","6.8","DL","","","TRG","","","40","LOQ","YES","-99","","","250","1.00","16","","  
"MB 320-237969/1-A","537","RES","MB 320-237969/1-A","TALSAC","335-67-1","Perfluorooctanoic acid  
(PFOA)","8.0","ng/L","U","2.8","DL","","","TRG","","","20","LOQ","YES","-99","","","250","1.00","8.0","","  
"MB 320-237969/1-A","537","RES","MB 320-237969/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS)","12","ng/L","U","5.5","DL","","","TRG","","","30","LOQ","YES","-99","","","250","1.00","12","","  
"MB 320-237969/1-A","537","RES","MB 320-237969/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS)","36","ng/L","U","16","DL","","","TRG","","","90","LOQ","YES","-99","","","250","1.00","36","","  
"MB 320-237969/1-A","537","RES","MB 320-237969/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA)","4.0","ng/L","U","1.9","DL","","","TRG","","","10","LOQ","YES","-99","","","250","1.00","4.0","","  
"MB 320-237969/1-A","537","RES","MB 320-237969/1-A","TALSAC","375-95-1","Perfluorononanoic acid  
(PFNA)","20","ng/L","U","8.0","DL","","","TRG","","","24","LOQ","YES","-99","","","250","1.00","20","","  
"MB 320-237969/1-A","537","RES","MB 320-237969/1-A","TALSAC","STL00993","13C2

PFHxA","36.1","ng/L","",-99","DL","","SURR","90","",-99","LOQ","YES","40.0","","250","1.00","0",""  
"MB 320-237969/1-A","537","RES","MB 320-237969/1-A","TALSAC","STL00996","13C2  
PFDA","37.8","ng/L","",-99","DL","","SURR","95","",-99","LOQ","YES","40.0","","250","1.00","0",""  
"Unknown","Unknown","WGNA-073118-RW-3785","07/31/2018 08:40","AQ","320-41679-  
1","NM","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018  
04:50","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-  
238610","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""  
"Unknown","Unknown","NAWC-073118-FRB-124","07/31/2018 12:35","AQ","320-41679-  
10","FB","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018  
05:51","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-  
238612","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""  
"Unknown","Unknown","WGNA-073118-RW-3103","07/31/2018 13:40","AQ","320-41679-  
11","NM","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018  
05:55","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-  
238612","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""  
"Unknown","Unknown","WGNA-073118-FRB-3103","07/31/2018 13:35","AQ","320-41679-  
12","FB","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018  
06:00","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-  
238612","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""  
"Unknown","Unknown","WGNA-073118-RW-3785MS","07/31/2018 08:40","AQ","320-41679-  
1MS","MS","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018  
04:55","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-  
238610","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""  
"Unknown","Unknown","WGNA-073118-RW-3785MSD","07/31/2018 08:40","AQ","320-41679-  
1MSD","MSD","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018  
04:59","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-  
238610","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""  
"Unknown","Unknown","WGNA-073118-FRB-3785","07/31/2018 08:35","AQ","320-41679-  
2","FB","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018  
05:04","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-  
238610","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""  
"Unknown","Unknown","NAWC-073118-RW-154","07/31/2018 10:10","AQ","320-41679-  
3","NM","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018  
05:09","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-  
238610","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""  
"Unknown","Unknown","NAWC-073118-FRB-154","07/31/2018 10:05","AQ","320-41679-  
4","FB","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018  
05:13","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-  
238610","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""  
"Unknown","Unknown","NAWC-073118-RW-185","07/31/2018 11:10","AQ","320-41679-  
5","NM","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018  
05:18","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-  
238610","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""  
"Unknown","Unknown","NAWC-073118-FRB-185","07/31/2018 11:05","AQ","320-41679-  
6","FB","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018  
05:23","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-  
238610","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""  
"Unknown","Unknown","NAWC-073118-RW-179","07/31/2018 12:10","AQ","320-41679-  
7","NM","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018  
05:37","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-  
238612","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""  
"Unknown","Unknown","NAWC-073118-FRB-179","07/31/2018 12:05","AQ","320-41679-  
8","FB","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018  
05:41","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-

238612","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""  
"Unknown","Unknown","NAWC-073118-RW-124","07/31/2018 12:40","AQ","320-41679-  
9","NM","","0.70","537","METHOD","RES","08/04/2018 08:24","08/08/2018  
05:46","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-  
238612","320-41679-1","08/01/2018 09:45","08/03/2018 13:05",""  
"Unknown","Unknown","LCS 320-237969/2-A","","AQ","LCS 320-237969/2-  
A","LCS","","-99","537","METHOD","RES","08/04/2018 08:24","08/08/2018  
04:45","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-  
238610","320-41679-1","08/04/2018 08:24","08/03/2018 13:05",""  
"Unknown","Unknown","MB 320-237969/1-A","","AQ","MB 320-237969/1-  
A","MB","","-99","537","METHOD","RES","08/04/2018 08:24","08/08/2018  
04:40","TALSAC","COA","WET","NA","1","NA","NA","","100","320-237969","320-237969","NA","320-  
238610","320-41679-1","08/04/2018 08:24","08/03/2018 13:05",""



**TO:** A. FREBOWITZ **DATE:** SEPTEMBER 19, 2018  
**FROM:** TERRI L. SOLOMON **COPIES:** DV FILE  
**SUBJECT:** ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)  
NAS JRB WILLOW GROVE  
SAMPLE DELIVERY GROUP (SDG) 320-41679-1

**SAMPLES:** 6/Field Reagent Blank (FRB)  
NAWC-073118-FRB-124 NAWC-073118-FRB-154  
NAWC-073118-FRB-179 NAWC-073118-FRB-185  
WGNA-073118-FRB-3103 WGNA-073118-FRB-3785  
  
6/Drinking Water  
NAWC-073118-RW-124 NAWC-073118-RW-154  
NAWC-073118-RW-179 NAWC-073118-RW-185  
WGNA-073118-RW-3103 WGNA-073118-RW-3785

#### Overview

The sample set for NAS JRB Willow Grove, SDG 320-41679-1, consisted of six (6) drinking water samples and six (6) FRB samples. All samples were analyzed for select perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA) and perfluorooctane sulfonic acid (PFOS). No field duplicate pairs were included in this SDG.

The samples were collected by Tetra Tech on July 31, 2018 and analyzed by Test America-Sacramento. All sample analyses were conducted in accordance with EPA Method 537 version 1.1 analytical and reporting protocols.

The data contained in this SDG was validated with regard to the following parameters: data completeness, holding times, mass calibration, mass spectral acquisition rate, tune check, instrument sensitivity check, initial/continuing calibrations, ion transitions, laboratory method/FRBs, surrogate spike recoveries, laboratory control sample results, matrix spike / matrix spike duplicate results, injected internal standard areas and recoveries, chromatographic resolution, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

#### Major

None.

#### Minor

Detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated (J).

#### Notes

Samples with detections and their associated FRBs are summarized below. No detected results were present in the FRBs.

#### Sample

NAWC-073118-RW-124

#### Associated FRB

NAWC-073118-FRB-124

TO: A. FREBOWITZ  
SDG: 320-41679-1

PAGE 2

NAWC-073118-RW-154  
NAWC-073118-RW-179  
NAWC-073118-RW-185  
WGNA-073118-RW-3103  
WGNA-073118-RW-3785

NAWC-073118-FRB-154  
NAWC-073118-FRB-179  
NAWC-073118-FRB-185  
WGNA-073118-FRB-3103  
WGNA-073118-FRB-3785

Non-detected results were reported to the Limit of Detection (LOD).

The buffering agent Trizma was added to all drinking water samples.

### **Executive Summary**

**Laboratory Performance:** None.

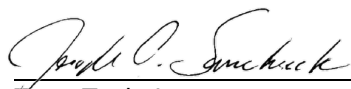
**Other Factors Affecting Data Quality:** Results below the RL were estimated.

The data for these analyses were reviewed with reference to the Environmental Protection Agency document EPA/600/R-08/092, Method 537, "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)", (September 2009), US EPA National Functional Guidelines for Organic Data Review (January 2017), and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (July 2013) as applicable. The text of this report has been formulated to address only those areas affecting data quality.



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Tetra Tech, Inc.  
Terri L. Solomon  
Chemist/Data Validator



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Tetra Tech, Inc.  
Joseph A. Samchuck  
Data Validation Manager

### **Attachments:**

Appendix A – Qualified Analytical Results  
Appendix B – Results as Reported by the Laboratory  
Appendix C – Support Documentation



### Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

|           |                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>U</b>  | The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.                                                                                                                                                                                                                                                               |
| <b>J</b>  | The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).                                                                                   |
| <b>J+</b> | The result is an estimated quantity, but the result may be biased high.                                                                                                                                                                                                                                                                                                                         |
| <b>J-</b> | The result is an estimated quantity, but the result may be biased low.                                                                                                                                                                                                                                                                                                                          |
| <b>UJ</b> | The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.                                                                                                                                                                                                                                                             |
| <b>NJ</b> | The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.                                                                                                                                                                                                                                    |
| <b>R</b>  | The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.                                                                                                                                                                                                                   |
| <b>UR</b> | The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.                                                                                                                                                                                                                |
| <b>X</b>  | The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended. |

## **Appendix A**

### Qualified Analytical Results

**Qualifier Codes:**

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
- C01 = GC/MS Tuning Noncompliance
- D = MS/MSD Recovery Noncompliance
- E = LCS/LCSD Recovery Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = ICP PDS Recovery Noncompliance; MSA's  $r < 0.995$
- K = ICP Interference - includes ICS % R Noncompliance
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation Noncompliance
- N = Internal Standard Noncompliance
- N01 = Internal Standard Recovery Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ( $< 2 \times$  IDL for inorganics and  $<$ CRQL for organics)
- Q = Other problems (can encompass a number of issues; i.e. chromatography, interferences, etc.)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = RPD between columns/detectors  $>40\%$  for positive results determined via GC/HPLC
- V = Non-linear calibrations; correlation coefficient  $r < 0.995$
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids  $<30\%$
- Z = Uncertainty at 2 standard deviations is greater than sample activity
- Z1 = Tentatively Identified Compound considered presumptively present
- Z2 = Tentatively Identified Compound column bleed
- Z3 = Tentatively Identified Compound aldol condensate
- Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
- Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

|                                                                                                       |            |                     |     |      |                     |     |      |                     |     |      |                     |     |      |
|-------------------------------------------------------------------------------------------------------|------------|---------------------|-----|------|---------------------|-----|------|---------------------|-----|------|---------------------|-----|------|
| <b>PROJ_NO: 08005-WE04</b><br><b>SDG: 320-41679-1</b><br><b>FRACTION: PFAS</b><br><b>MEDIA: WATER</b> | NSAMPLE    | NAWC-073118-FRB-124 |     |      | NAWC-073118-FRB-154 |     |      | NAWC-073118-FRB-179 |     |      | NAWC-073118-FRB-185 |     |      |
|                                                                                                       | LAB_ID     | 320-41679-10        |     |      | 320-41679-4         |     |      | 320-41679-8         |     |      | 320-41679-6         |     |      |
|                                                                                                       | SAMP_DATE  | 7/31/2018           |     |      | 7/31/2018           |     |      | 7/31/2018           |     |      | 7/31/2018           |     |      |
|                                                                                                       | QC_TYPE    | FB                  |     |      | FB                  |     |      | FB                  |     |      | FB                  |     |      |
|                                                                                                       | UNITS      | NG/L                |     |      | NG/L                |     |      | NG/L                |     |      | NG/L                |     |      |
|                                                                                                       | PCT_SOLIDS | 0.0                 |     |      | 0.0                 |     |      | 0.0                 |     |      | 0.0                 |     |      |
|                                                                                                       | DUP_OF     |                     |     |      |                     |     |      |                     |     |      |                     |     |      |
| PARAMETER                                                                                             |            | RESULT              | VQL | QLCD | RESULT              | VQL | QLCD | RESULT              | VQL | QLCD | RESULT              | VQL | QLCD |
| PENTADECAFLUOROOCTANOIC ACID (PFOA)                                                                   |            | 7.9                 | U   |      | 7.8                 | U   |      | 7.9                 | U   |      | 8.2                 | U   |      |
| PERFLUOROBUTANESULFONIC ACID (PFBS)                                                                   |            | 35                  | U   |      | 35                  | U   |      | 36                  | U   |      | 37                  | U   |      |
| PERFLUOROHEPTANOIC ACID (PFHPA)                                                                       |            | 3.9                 | U   |      | 3.9                 | U   |      | 4                   | U   |      | 4.1                 | U   |      |
| PERFLUOROHXANESULFONIC ACID (PFHXS)                                                                   |            | 12                  | U   |      | 12                  | U   |      | 12                  | U   |      | 12                  | U   |      |
| PERFLUORONONANOIC ACID (PFNA)                                                                         |            | 20                  | U   |      | 19                  | U   |      | 20                  | U   |      | 20                  | U   |      |
| PERFLUOROOCTANESULFONIC ACID (PFOS)                                                                   |            | 16                  | U   |      | 16                  | U   |      | 16                  | U   |      | 16                  | U   |      |

|                                                                                                       |            |                    |     |      |                    |     |      |                    |     |      |                    |     |      |
|-------------------------------------------------------------------------------------------------------|------------|--------------------|-----|------|--------------------|-----|------|--------------------|-----|------|--------------------|-----|------|
| <b>PROJ_NO: 08005-WE04</b><br><b>SDG: 320-41679-1</b><br><b>FRACTION: PFAS</b><br><b>MEDIA: WATER</b> | NSAMPLE    | NAWC-073118-RW-124 |     |      | NAWC-073118-RW-154 |     |      | NAWC-073118-RW-179 |     |      | NAWC-073118-RW-185 |     |      |
|                                                                                                       | LAB_ID     | 320-41679-9        |     |      | 320-41679-3        |     |      | 320-41679-7        |     |      | 320-41679-5        |     |      |
|                                                                                                       | SAMP_DATE  | 7/31/2018          |     |      | 7/31/2018          |     |      | 7/31/2018          |     |      | 7/31/2018          |     |      |
|                                                                                                       | QC_TYPE    | NM                 |     |      | NM                 |     |      | NM                 |     |      | NM                 |     |      |
|                                                                                                       | UNITS      | NG/L               |     |      | NG/L               |     |      | NG/L               |     |      | NG/L               |     |      |
|                                                                                                       | PCT_SOLIDS | 0.0                |     |      | 0.0                |     |      | 0.0                |     |      | 0.0                |     |      |
|                                                                                                       | DUP_OF     |                    |     |      |                    |     |      |                    |     |      |                    |     |      |
| PARAMETER                                                                                             |            | RESULT             | VQL | QLCD | RESULT             | VQL | QLCD | RESULT             | VQL | QLCD | RESULT             | VQL | QLCD |
| PENTADECAFLUOROOCTANOIC ACID (PFOA)                                                                   |            | 20                 |     |      | 24                 |     |      | 21                 |     |      | 12                 | J   | P    |
| PERFLUOROBUTANESULFONIC ACID (PFBS)                                                                   |            | 35                 | U   |      | 35                 | U   |      | 35                 | U   |      | 34                 | U   |      |
| PERFLUOROHEPTANOIC ACID (PFHPA)                                                                       |            | 4.7                | J   | P    | 8.9                | J   | P    | 6                  | J   | P    | 8.2                | J   | P    |
| PERFLUOROHXANESULFONIC ACID (PFHXS)                                                                   |            | 14                 | J   | P    | 12                 | U   |      | 7.1                | J   | P    | 8.5                | J   | P    |
| PERFLUORONONANOIC ACID (PFNA)                                                                         |            | 20                 | U   |      | 20                 | U   |      | 19                 | U   |      | 19                 | U   |      |
| PERFLUOROOCTANESULFONIC ACID (PFOS)                                                                   |            | 31                 | J   | P    | 17                 | J   | P    | 17                 | J   | P    | 15                 | J   | P    |

|                                                                                                       |            |                      |     |      |                      |     |      |                     |     |      |                     |     |      |
|-------------------------------------------------------------------------------------------------------|------------|----------------------|-----|------|----------------------|-----|------|---------------------|-----|------|---------------------|-----|------|
| <b>PROJ_NO: 08005-WE04</b><br><b>SDG: 320-41679-1</b><br><b>FRACTION: PFAS</b><br><b>MEDIA: WATER</b> | NSAMPLE    | WGNA-073118-FRB-3103 |     |      | WGNA-073118-FRB-3785 |     |      | WGNA-073118-RW-3103 |     |      | WGNA-073118-RW-3785 |     |      |
|                                                                                                       | LAB_ID     | 320-41679-12         |     |      | 320-41679-2          |     |      | 320-41679-11        |     |      | 320-41679-1         |     |      |
|                                                                                                       | SAMP_DATE  | 7/31/2018            |     |      | 7/31/2018            |     |      | 7/31/2018           |     |      | 7/31/2018           |     |      |
|                                                                                                       | QC_TYPE    | FB                   |     |      | FB                   |     |      | NM                  |     |      | NM                  |     |      |
|                                                                                                       | UNITS      | NG/L                 |     |      | NG/L                 |     |      | NG/L                |     |      | NG/L                |     |      |
|                                                                                                       | PCT_SOLIDS | 0.0                  |     |      | 0.0                  |     |      | 0.0                 |     |      | 0.0                 |     |      |
|                                                                                                       | DUP_OF     |                      |     |      |                      |     |      |                     |     |      |                     |     |      |
| PARAMETER                                                                                             |            | RESULT               | VQL | QLCD | RESULT               | VQL | QLCD | RESULT              | VQL | QLCD | RESULT              | VQL | QLCD |
| PENTADECAFLUOROOCTANOIC ACID (PFOA)                                                                   |            | 7.7                  | U   |      | 7.6                  | U   |      | 8.3                 | J   | P    | 16                  | J   | P    |
| PERFLUOROBUTANESULFONIC ACID (PFBS)                                                                   |            | 35                   | U   |      | 34                   | U   |      | 35                  | U   |      | 37                  | U   |      |
| PERFLUOROHEPTANOIC ACID (PFHPA)                                                                       |            | 3.8                  | U   |      | 3.8                  | U   |      | 2.4                 | J   | P    | 5.9                 | J   | P    |
| PERFLUOROHXANESULFONIC ACID (PFHXS)                                                                   |            | 12                   | U   |      | 11                   | U   |      | 12                  | U   |      | 15                  | J   | P    |
| PERFLUORONONANOIC ACID (PFNA)                                                                         |            | 19                   | U   |      | 19                   | U   |      | 19                  | U   |      | 21                  | U   |      |
| PERFLUOROOCTANESULFONIC ACID (PFOS)                                                                   |            | 15                   | U   |      | 15                   | U   |      | 7.1                 | J   | P    | 11                  | J   | P    |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073118-RW-3785 Lab Sample ID: 320-41679-1  
 Matrix: Water Lab File ID: 2018.08.07\_537C\_025.d  
 Analysis Method: 537 Date Collected: 07/31/2018 08:40  
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24  
 Sample wt/vol: 240.3(mL) Date Analyzed: 08/08/2018 04:50  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238610 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 11     | J | 42  | 17  | 7.1 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 16     | J | 21  | 8.3 | 2.9 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 21     | U | 25  | 21  | 8.3 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 15     | J | 31  | 12  | 5.7 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 5.9    | J | 10  | 4.2 | 2.0 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 37     | U | 94  | 37  | 17  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 88   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 103  |   | 70-130 |

*Wesley L. Salomon*  
09/19/2018

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073118-FRB-3785 Lab Sample ID: 320-41679-2  
 Matrix: Water Lab File ID: 2018.08.07\_537C\_028.d  
 Analysis Method: 537 Date Collected: 07/31/2018 08:35  
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24  
 Sample wt/vol: 261.7(mL) Date Analyzed: 08/08/2018 05:04  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238610 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 15     | U | 38  | 15  | 6.5 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.6    | U | 19  | 7.6 | 2.7 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U | 23  | 19  | 7.6 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 11     | U | 29  | 11  | 5.3 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 3.8    | U | 9.6 | 3.8 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 34     | U | 86  | 34  | 15  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 86   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 97   |   | 70-130 |

*Teri L. Selman*  
09/19/2018



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-073118-RW-154 Lab Sample ID: 320-41679-3  
 Matrix: Water Lab File ID: 2018.08.07\_537C\_029.d  
 Analysis Method: 537 Date Collected: 07/31/2018 10:10  
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24  
 Sample wt/vol: 254.3 (mL) Date Analyzed: 08/08/2018 05:09  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238610 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 17     | J | 39  | 16  | 6.7 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 24     |   | 20  | 7.9 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 7.9 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 29  | 12  | 5.4 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 8.9    | J | 9.8 | 3.9 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 88  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 80   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 94   |   | 70-130 |

*Ali L. Salameh*  
09/19/2018

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-073118-FRB-154 Lab Sample ID: 320-41679-4  
 Matrix: Water Lab File ID: 2018.08.07\_537C\_030.d  
 Analysis Method: 537 Date Collected: 07/31/2018 10:05  
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24  
 Sample wt/vol: 257.7(mL) Date Analyzed: 08/08/2018 05:13  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238610 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 39  | 16  | 6.6 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.8    | U | 19  | 7.8 | 2.7 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U | 23  | 19  | 7.8 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 29  | 12  | 5.3 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 3.9    | U | 9.7 | 3.9 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 87  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 86   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 98   |   | 70-130 |

*Wesley L. Salomon*  
09/19/2018

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-073118-RW-185 Lab Sample ID: 320-41679-5  
 Matrix: Water Lab File ID: 2018.08.07\_537C\_031.d  
 Analysis Method: 537 Date Collected: 07/31/2018 11:10  
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24  
 Sample wt/vol: 265.9(mL) Date Analyzed: 08/08/2018 05:18  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238610 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 15     | J | 38  | 15  | 6.4 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 12     | J | 19  | 7.5 | 2.6 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U | 23  | 19  | 7.5 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 8.5    | J | 28  | 11  | 5.2 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 8.2    | J | 9.4 | 3.8 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 34     | U | 85  | 34  | 15  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 81   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 94   |   | 70-130 |

*Ali L. Salameh*  
09/19/2018

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-073118-FRB-185 Lab Sample ID: 320-41679-6  
 Matrix: Water Lab File ID: 2018.08.07\_537C\_032.d  
 Analysis Method: 537 Date Collected: 07/31/2018 11:05  
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24  
 Sample wt/vol: 244.6(mL) Date Analyzed: 08/08/2018 05:23  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238610 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 41  | 16  | 7.0 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 8.2    | U | 20  | 8.2 | 2.9 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 25  | 20  | 8.2 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 31  | 12  | 5.6 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 4.1    | U | 10  | 4.1 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 37     | U | 92  | 37  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 98   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 103  |   | 70-130 |

*Wesley L. Salomon*  
09/19/2018

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-073118-RW-179 Lab Sample ID: 320-41679-7  
 Matrix: Water Lab File ID: 2018.08.07\_537C\_035.d  
 Analysis Method: 537 Date Collected: 07/31/2018 12:10  
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24  
 Sample wt/vol: 257.9(mL) Date Analyzed: 08/08/2018 05:37  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238612 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 17     | J | 39  | 16  | 6.6 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 21     |   | 19  | 7.8 | 2.7 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U | 23  | 19  | 7.8 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 7.1    | J | 29  | 12  | 5.3 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 6.0    | J | 9.7 | 3.9 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 87  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 87   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 101  |   | 70-130 |

*Ali L. Salmen*  
09/19/2018

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                              |
|----------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-41679-1</u>                  |
| SDG No.: _____                               |                                              |
| Client Sample ID: <u>NAWC-073118-FRB-179</u> | Lab Sample ID: <u>320-41679-8</u>            |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2018.08.07_537C_036.d</u>    |
| Analysis Method: <u>537</u>                  | Date Collected: <u>07/31/2018 12:05</u>      |
| Extraction Method: <u>537</u>                | Date Extracted: <u>08/04/2018 08:24</u>      |
| Sample wt/vol: <u>252.9 (mL)</u>             | Date Analyzed: <u>08/08/2018 05:41</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>          | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>              | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>238612</u>            | Units: <u>ng/L</u>                           |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 40  | 16  | 6.7 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.9    | U | 20  | 7.9 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 7.9 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 30  | 12  | 5.4 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 4.0    | U | 9.9 | 4.0 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 36     | U | 89  | 36  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 87   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 101  |   | 70-130 |

*Wesley L. Salomon*  
09/19/2018

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-073118-RW-124 Lab Sample ID: 320-41679-9  
 Matrix: Water Lab File ID: 2018.08.07\_537C\_037.d  
 Analysis Method: 537 Date Collected: 07/31/2018 12:40  
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24  
 Sample wt/vol: 253.7 (mL) Date Analyzed: 08/08/2018 05:46  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238612 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 31     | J | 39  | 16  | 6.7 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 20     |   | 20  | 7.9 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 7.9 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 14     | J | 30  | 12  | 5.4 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 4.7    | J | 9.9 | 3.9 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 89  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 83   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 94   |   | 70-130 |

*Heidi L. Selman*

09/19/2018

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-073118-FRB-124 Lab Sample ID: 320-41679-10  
 Matrix: Water Lab File ID: 2018.08.07\_537C\_038.d  
 Analysis Method: 537 Date Collected: 07/31/2018 12:35  
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24  
 Sample wt/vol: 254.5 (mL) Date Analyzed: 08/08/2018 05:51  
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238612 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 39  | 16  | 6.7 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.9    | U | 20  | 7.9 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 7.9 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 29  | 12  | 5.4 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 3.9    | U | 9.8 | 3.9 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 88  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 87   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 91   |   | 70-130 |

*Wesley L. Salomon*  
09/19/2018



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                              |
|----------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-41679-1</u>                  |
| SDG No.: _____                               |                                              |
| Client Sample ID: <u>WGNA-073118-RW-3103</u> | Lab Sample ID: <u>320-41679-11</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2018.08.07_537C_039.d</u>    |
| Analysis Method: <u>537</u>                  | Date Collected: <u>07/31/2018 13:40</u>      |
| Extraction Method: <u>537</u>                | Date Extracted: <u>08/04/2018 08:24</u>      |
| Sample wt/vol: <u>259.2 (mL)</u>             | Date Analyzed: <u>08/08/2018 05:55</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>          | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>              | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>238612</u>            | Units: <u>ng/L</u>                           |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q              | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|----------------|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 7.1    | J              | 39  | 15  | 6.6 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 8.3    | J              | 19  | 7.7 | 2.7 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U              | 23  | 19  | 7.7 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U              | 29  | 12  | 5.3 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 2.4    | J <del>M</del> | 9.6 | 3.9 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U <del>M</del> | 87  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 90   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 99   |   | 70-130 |

*Teri L. Salmeron*  
09/19/2018

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073118-FRB-3103 Lab Sample ID: 320-41679-12  
 Matrix: Water Lab File ID: 2018.08.07\_537C\_040.d  
 Analysis Method: 537 Date Collected: 07/31/2018 13:35  
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24  
 Sample wt/vol: 260.7(mL) Date Analyzed: 08/08/2018 06:00  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238612 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 15     | U | 38  | 15  | 6.5 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.7    | U | 19  | 7.7 | 2.7 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U | 23  | 19  | 7.7 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 29  | 12  | 5.3 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 3.8    | U | 9.6 | 3.8 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 86  | 35  | 15  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 85   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 92   |   | 70-130 |

*Wesley L. Salomon*  
09/19/2018

## **Appendix B**

Results as Reported by the Laboratory

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-073118-RW-3785 Lab Sample ID: 320-41679-1  
 Matrix: Water Lab File ID: 2018.08.07\_537C\_025.d  
 Analysis Method: 537 Date Collected: 07/31/2018 08:40  
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24  
 Sample wt/vol: 240.3(mL) Date Analyzed: 08/08/2018 04:50  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238610 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 11     | J | 42  | 17  | 7.1 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 16     | J | 21  | 8.3 | 2.9 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 21     | U | 25  | 21  | 8.3 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 15     | J | 31  | 12  | 5.7 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 5.9    | J | 10  | 4.2 | 2.0 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 37     | U | 94  | 37  | 17  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 88   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 103  |   | 70-130 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                               |                                             |
|-----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>       | Job No.: <u>320-41679-1</u>                 |
| SDG No.: _____                                |                                             |
| Client Sample ID: <u>WGNA-073118-FRB-3785</u> | Lab Sample ID: <u>320-41679-2</u>           |
| Matrix: <u>Water</u>                          | Lab File ID: <u>2018.08.07_537C_028.d</u>   |
| Analysis Method: <u>537</u>                   | Date Collected: <u>07/31/2018 08:35</u>     |
| Extraction Method: <u>537</u>                 | Date Extracted: <u>08/04/2018 08:24</u>     |
| Sample wt/vol: <u>261.7(mL)</u>               | Date Analyzed: <u>08/08/2018 05:04</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>            | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>                | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                             | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>238610</u>             | Units: <u>ng/L</u>                          |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 15     | U | 38  | 15  | 6.5 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.6    | U | 19  | 7.6 | 2.7 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U | 23  | 19  | 7.6 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 11     | U | 29  | 11  | 5.3 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 3.8    | U | 9.6 | 3.8 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 34     | U | 86  | 34  | 15  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 86   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 97   |   | 70-130 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                             |                                              |
|---------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>     | Job No.: <u>320-41679-1</u>                  |
| SDG No.: _____                              |                                              |
| Client Sample ID: <u>NAWC-073118-RW-154</u> | Lab Sample ID: <u>320-41679-3</u>            |
| Matrix: <u>Water</u>                        | Lab File ID: <u>2018.08.07_537C_029.d</u>    |
| Analysis Method: <u>537</u>                 | Date Collected: <u>07/31/2018 10:10</u>      |
| Extraction Method: <u>537</u>               | Date Extracted: <u>08/04/2018 08:24</u>      |
| Sample wt/vol: <u>254.3 (mL)</u>            | Date Analyzed: <u>08/08/2018 05:09</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>         | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>             | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                           | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>238610</u>           | Units: <u>ng/L</u>                           |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 17     | J | 39  | 16  | 6.7 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 24     |   | 20  | 7.9 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 7.9 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 29  | 12  | 5.4 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 8.9    | J | 9.8 | 3.9 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 88  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 80   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 94   |   | 70-130 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                             |
|----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-41679-1</u>                 |
| SDG No.: _____                               |                                             |
| Client Sample ID: <u>NAWC-073118-FRB-154</u> | Lab Sample ID: <u>320-41679-4</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2018.08.07_537C_030.d</u>   |
| Analysis Method: <u>537</u>                  | Date Collected: <u>07/31/2018 10:05</u>     |
| Extraction Method: <u>537</u>                | Date Extracted: <u>08/04/2018 08:24</u>     |
| Sample wt/vol: <u>257.7(mL)</u>              | Date Analyzed: <u>08/08/2018 05:13</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>           | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>238610</u>            | Units: <u>ng/L</u>                          |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 39  | 16  | 6.6 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.8    | U | 19  | 7.8 | 2.7 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U | 23  | 19  | 7.8 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 29  | 12  | 5.3 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 3.9    | U | 9.7 | 3.9 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 87  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 86   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 98   |   | 70-130 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-073118-RW-185 Lab Sample ID: 320-41679-5  
 Matrix: Water Lab File ID: 2018.08.07\_537C\_031.d  
 Analysis Method: 537 Date Collected: 07/31/2018 11:10  
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24  
 Sample wt/vol: 265.9(mL) Date Analyzed: 08/08/2018 05:18  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238610 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 15     | J | 38  | 15  | 6.4 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 12     | J | 19  | 7.5 | 2.6 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U | 23  | 19  | 7.5 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 8.5    | J | 28  | 11  | 5.2 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 8.2    | J | 9.4 | 3.8 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 34     | U | 85  | 34  | 15  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 81   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 94   |   | 70-130 |



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                             |
|----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-41679-1</u>                 |
| SDG No.: _____                               |                                             |
| Client Sample ID: <u>NAWC-073118-FRB-185</u> | Lab Sample ID: <u>320-41679-6</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2018.08.07_537C_032.d</u>   |
| Analysis Method: <u>537</u>                  | Date Collected: <u>07/31/2018 11:05</u>     |
| Extraction Method: <u>537</u>                | Date Extracted: <u>08/04/2018 08:24</u>     |
| Sample wt/vol: <u>244.6(mL)</u>              | Date Analyzed: <u>08/08/2018 05:23</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>           | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>238610</u>            | Units: <u>ng/L</u>                          |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 41  | 16  | 7.0 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 8.2    | U | 20  | 8.2 | 2.9 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 25  | 20  | 8.2 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 31  | 12  | 5.6 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 4.1    | U | 10  | 4.1 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 37     | U | 92  | 37  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 98   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 103  |   | 70-130 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                             |                                             |
|---------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>     | Job No.: <u>320-41679-1</u>                 |
| SDG No.: _____                              |                                             |
| Client Sample ID: <u>NAWC-073118-RW-179</u> | Lab Sample ID: <u>320-41679-7</u>           |
| Matrix: <u>Water</u>                        | Lab File ID: <u>2018.08.07_537C_035.d</u>   |
| Analysis Method: <u>537</u>                 | Date Collected: <u>07/31/2018 12:10</u>     |
| Extraction Method: <u>537</u>               | Date Extracted: <u>08/04/2018 08:24</u>     |
| Sample wt/vol: <u>257.9(mL)</u>             | Date Analyzed: <u>08/08/2018 05:37</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>          | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>              | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                           | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>238612</u>           | Units: <u>ng/L</u>                          |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 17     | J | 39  | 16  | 6.6 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 21     |   | 19  | 7.8 | 2.7 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U | 23  | 19  | 7.8 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 7.1    | J | 29  | 12  | 5.3 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 6.0    | J | 9.7 | 3.9 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 87  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 87   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 101  |   | 70-130 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                             |
|----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-41679-1</u>                 |
| SDG No.: _____                               |                                             |
| Client Sample ID: <u>NAWC-073118-FRB-179</u> | Lab Sample ID: <u>320-41679-8</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2018.08.07_537C_036.d</u>   |
| Analysis Method: <u>537</u>                  | Date Collected: <u>07/31/2018 12:05</u>     |
| Extraction Method: <u>537</u>                | Date Extracted: <u>08/04/2018 08:24</u>     |
| Sample wt/vol: <u>252.9(mL)</u>              | Date Analyzed: <u>08/08/2018 05:41</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>           | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>               | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>238612</u>            | Units: <u>ng/L</u>                          |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 40  | 16  | 6.7 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.9    | U | 20  | 7.9 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 7.9 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 30  | 12  | 5.4 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 4.0    | U | 9.9 | 4.0 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 36     | U | 89  | 36  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 87   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 101  |   | 70-130 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-073118-RW-124 Lab Sample ID: 320-41679-9  
 Matrix: Water Lab File ID: 2018.08.07\_537C\_037.d  
 Analysis Method: 537 Date Collected: 07/31/2018 12:40  
 Extraction Method: 537 Date Extracted: 08/04/2018 08:24  
 Sample wt/vol: 253.7(mL) Date Analyzed: 08/08/2018 05:46  
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 238612 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 31     | J | 39  | 16  | 6.7 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 20     |   | 20  | 7.9 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 7.9 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 14     | J | 30  | 12  | 5.4 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 4.7    | J | 9.9 | 3.9 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 89  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 83   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 94   |   | 70-130 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                              |
|----------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-41679-1</u>                  |
| SDG No.: _____                               |                                              |
| Client Sample ID: <u>NAWC-073118-FRB-124</u> | Lab Sample ID: <u>320-41679-10</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2018.08.07_537C_038.d</u>    |
| Analysis Method: <u>537</u>                  | Date Collected: <u>07/31/2018 12:35</u>      |
| Extraction Method: <u>537</u>                | Date Extracted: <u>08/04/2018 08:24</u>      |
| Sample wt/vol: <u>254.5 (mL)</u>             | Date Analyzed: <u>08/08/2018 05:51</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>          | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>              | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>238612</u>            | Units: <u>ng/L</u>                           |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 39  | 16  | 6.7 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.9    | U | 20  | 7.9 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 7.9 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 29  | 12  | 5.4 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 3.9    | U | 9.8 | 3.9 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 88  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 87   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 91   |   | 70-130 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                              |                                              |
|----------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>      | Job No.: <u>320-41679-1</u>                  |
| SDG No.: _____                               |                                              |
| Client Sample ID: <u>WGNA-073118-RW-3103</u> | Lab Sample ID: <u>320-41679-11</u>           |
| Matrix: <u>Water</u>                         | Lab File ID: <u>2018.08.07_537C_039.d</u>    |
| Analysis Method: <u>537</u>                  | Date Collected: <u>07/31/2018 13:40</u>      |
| Extraction Method: <u>537</u>                | Date Extracted: <u>08/04/2018 08:24</u>      |
| Sample wt/vol: <u>259.2 (mL)</u>             | Date Analyzed: <u>08/08/2018 05:55</u>       |
| Con. Extract Vol.: <u>1.00 (mL)</u>          | Dilution Factor: <u>1</u>                    |
| Injection Volume: <u>2 (uL)</u>              | GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u> |
| % Moisture: _____                            | GPC Cleanup: (Y/N) <u>N</u>                  |
| Analysis Batch No.: <u>238612</u>            | Units: <u>ng/L</u>                           |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q   | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|-----|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 7.1    | J   | 39  | 15  | 6.6 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 8.3    | J   | 19  | 7.7 | 2.7 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U   | 23  | 19  | 7.7 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U   | 29  | 12  | 5.3 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 2.4    | J M | 9.6 | 3.9 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U M | 87  | 35  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 90   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 99   |   | 70-130 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                               |                                             |
|-----------------------------------------------|---------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>       | Job No.: <u>320-41679-1</u>                 |
| SDG No.: _____                                |                                             |
| Client Sample ID: <u>WGNA-073118-FRB-3103</u> | Lab Sample ID: <u>320-41679-12</u>          |
| Matrix: <u>Water</u>                          | Lab File ID: <u>2018.08.07_537C_040.d</u>   |
| Analysis Method: <u>537</u>                   | Date Collected: <u>07/31/2018 13:35</u>     |
| Extraction Method: <u>537</u>                 | Date Extracted: <u>08/04/2018 08:24</u>     |
| Sample wt/vol: <u>260.7(mL)</u>               | Date Analyzed: <u>08/08/2018 06:00</u>      |
| Con. Extract Vol.: <u>1.00(mL)</u>            | Dilution Factor: <u>1</u>                   |
| Injection Volume: <u>2(uL)</u>                | GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u> |
| % Moisture: _____                             | GPC Cleanup: (Y/N) <u>N</u>                 |
| Analysis Batch No.: <u>238612</u>             | Units: <u>ng/L</u>                          |

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 15     | U | 38  | 15  | 6.5 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 7.7    | U | 19  | 7.7 | 2.7 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 19     | U | 23  | 19  | 7.7 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 29  | 12  | 5.3 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 3.8    | U | 9.6 | 3.8 | 1.8 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 35     | U | 86  | 35  | 15  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 85   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 92   |   | 70-130 |

## **Appendix C**

Support Documentation



TestAmerica  
880 Riverside F  
West Sacramento  
phone 916.373.



320-41679 Chain of Custody

## Chain of Custody Record

TestAmerica  
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Analysis Program: ☒ DW ☐ NPDES ☐ RCRA ☐ Other:

|                                                                                                                                                                                             |                    |                                                                              |                                        |                                                                                     |                   |                                                                                                                                                 |   |                               |                     |                                                                            |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------|---------------------|----------------------------------------------------------------------------|--|
| <b>Client Contact</b>                                                                                                                                                                       |                    | <b>Project Manager:</b> Andy Frebowitz                                       |                                        | <b>Site Contact:</b> Mary Kay Bond                                                  |                   | <b>Date:</b> 7/31/2018                                                                                                                          |   | <b>COC No:</b>                |                     |                                                                            |  |
| TetraTech                                                                                                                                                                                   |                    | <b>Tel/Fax:</b> 610.382.1170                                                 |                                        | <b>Lab Contact:</b> Dave Alltucker                                                  |                   | <b>Carrier:</b> FedEx                                                                                                                           |   | 1 of 1 COCs                   |                     |                                                                            |  |
| 234 Mall Boulevard Suite 260                                                                                                                                                                |                    | <b>Analysis Turnaround Time</b>                                              |                                        | <b>Filtered Sample (Y/N)</b><br><b>Perform MS/MSD (Y/N)</b><br><b>EPA 537 UCMR3</b> |                   |                                                                                                                                                 |   | <b>Sampler:</b> Mary Kay Bond |                     |                                                                            |  |
| King of Prussia, PA 19406                                                                                                                                                                   |                    | <input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS |                                        |                                                                                     |                   |                                                                                                                                                 |   |                               |                     | <b>For Lab Use Only:</b><br><b>Walk-in Client:</b><br><b>Lab Sampling:</b> |  |
| 610-382-1174                                                                                                                                                                                |                    | TAT if different from Below 21                                               |                                        |                                                                                     |                   |                                                                                                                                                 |   |                               |                     |                                                                            |  |
| 610-491-9688                                                                                                                                                                                |                    | <input type="checkbox"/> 2 weeks                                             |                                        |                                                                                     |                   |                                                                                                                                                 |   |                               |                     |                                                                            |  |
| Project Name: WE04                                                                                                                                                                          |                    | <input type="checkbox"/> 1 week                                              |                                        |                                                                                     |                   |                                                                                                                                                 |   |                               |                     |                                                                            |  |
| Site: WE04                                                                                                                                                                                  |                    | <input type="checkbox"/> 2 days                                              |                                        |                                                                                     |                   |                                                                                                                                                 |   | Job / SDG No.:                |                     |                                                                            |  |
| P O # 1132358 (through EarthToxics)                                                                                                                                                         |                    | <input type="checkbox"/> 1 day                                               |                                        |                                                                                     |                   |                                                                                                                                                 |   |                               |                     |                                                                            |  |
| <b>Sample Identification</b>                                                                                                                                                                | <b>Sample Date</b> | <b>Sample Time</b>                                                           | <b>Sample Type</b><br>(C=Comp, G=Grab) | <b>Matrix</b>                                                                       | <b># of Cont.</b> |                                                                                                                                                 |   | <b>Sample Specific Notes:</b> |                     |                                                                            |  |
| WGNA-073118-RW-3785                                                                                                                                                                         | 7/31/2018          | 8:40                                                                         | G                                      | DW                                                                                  | 6                 | N                                                                                                                                               | Y | Y                             | MS/MSD              |                                                                            |  |
| WGNA-073118-FRB-3785                                                                                                                                                                        | 7/31/2018          | 8:35                                                                         | G                                      | DW                                                                                  | 2                 | N                                                                                                                                               | N | Y                             | Field Reagent Blank |                                                                            |  |
| NAWC-073118-RW-154                                                                                                                                                                          | 7/31/2018          | 10:10                                                                        | G                                      | DW                                                                                  | 2                 | N                                                                                                                                               | N | Y                             |                     |                                                                            |  |
| NAWC-073118-FRB-154                                                                                                                                                                         | 7/31/2018          | 10:05                                                                        | G                                      | DW                                                                                  | 2                 | N                                                                                                                                               | N | Y                             | Field Reagent Blank |                                                                            |  |
| NAWC-073118-RW-185                                                                                                                                                                          | 7/31/2018          | 11:10                                                                        | G                                      | DW                                                                                  | 2                 | N                                                                                                                                               | N | Y                             |                     |                                                                            |  |
| NAWC-073118-FRB-185                                                                                                                                                                         | 7/31/2018          | 11:05                                                                        | G                                      | DW                                                                                  | 2                 | N                                                                                                                                               | N | Y                             | Field Reagent Blank |                                                                            |  |
| NAWC-073118-RW-179                                                                                                                                                                          | 7/31/2018          | 12:10                                                                        | G                                      | DW                                                                                  | 2                 | N                                                                                                                                               | N | Y                             |                     |                                                                            |  |
| NAWC-073118-FRB-179                                                                                                                                                                         | 7/31/2018          | 12:05                                                                        | G                                      | DW                                                                                  | 2                 | N                                                                                                                                               | N | Y                             | Field Reagent Blank |                                                                            |  |
| NAWC-073118-RW-124                                                                                                                                                                          | 7/31/2018          | 12:40                                                                        | G                                      | DW                                                                                  | 2                 | N                                                                                                                                               | N | Y                             |                     |                                                                            |  |
| NAWC-073118-FRB-124                                                                                                                                                                         | 7/31/2018          | 12:35                                                                        | G                                      | DW                                                                                  | 2                 | N                                                                                                                                               | N | Y                             | Field Reagent Blank |                                                                            |  |
| WGNA-073118-RW-3103                                                                                                                                                                         | 7/31/2018          | 13:40                                                                        | G                                      | DW                                                                                  | 2                 | N                                                                                                                                               | N | Y                             |                     |                                                                            |  |
| WGNA-073118-FRB-3103                                                                                                                                                                        | 7/31/2018          | 13:35                                                                        | G                                      | DW                                                                                  | 2                 | N                                                                                                                                               | N | Y                             | Field Reagent Blank |                                                                            |  |
| <b>Preservation Used:</b> 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other: Trizma                                                                                                      |                    |                                                                              |                                        |                                                                                     |                   | 6                                                                                                                                               |   |                               |                     |                                                                            |  |
| <b>Possible Hazard Identification:</b>                                                                                                                                                      |                    |                                                                              |                                        |                                                                                     |                   | <b>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</b>                                                      |   |                               |                     |                                                                            |  |
| Comments Section if the lab is to dispose of the sample.                                                                                                                                    |                    |                                                                              |                                        |                                                                                     |                   |                                                                                                                                                 |   |                               |                     |                                                                            |  |
| <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown |                    |                                                                              |                                        |                                                                                     |                   | <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months |   |                               |                     |                                                                            |  |
| Fed Ex Tracking: 7728 5616 9145                                                                                                                                                             |                    |                                                                              |                                        |                                                                                     |                   |                                                                                                                                                 |   |                               |                     |                                                                            |  |
| <b>Custody Seals Intact:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                       |                    | <b>Custody Seal No.:</b>                                                     |                                        | <b>Cooler Temp. (°C):</b> Obs'd: 0.7 Corr'd: 0.7                                    |                   | <b>Therm ID No.:</b> ALS-7.e                                                                                                                    |   |                               |                     |                                                                            |  |
| Relinquished by: <i>Mary Kay Bond</i>                                                                                                                                                       |                    | Company: Tetra Tech                                                          |                                        | Date/Time: 7/31/2018 16:00                                                          |                   | Received by: <i>[Signature]</i>                                                                                                                 |   | Company: <i>SA-CAC</i>        |                     |                                                                            |  |
| Relinquished by:                                                                                                                                                                            |                    | Company:                                                                     |                                        | Date/Time:                                                                          |                   | Received by:                                                                                                                                    |   | Date/Time: 8/1/18 0945        |                     |                                                                            |  |
| Relinquished by:                                                                                                                                                                            |                    | Company:                                                                     |                                        | Date/Time:                                                                          |                   | Received in Laboratory by:                                                                                                                      |   | Date/Time:                    |                     |                                                                            |  |

Form No. CA-C-WI-002, Rev. 4.11, dated 1/24/2017

**Job Narrative**  
**320-41679-1**

**Receipt**

The samples were received on 8/1/2018 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.7° C.

**LCMS**

Method(s) 537: The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**Organic Prep**

Method(s) 537: The following sample: NAWC-073118-RW-154 (320-41679-3) in preparation batch 320-237969 was observed to be a yellow color prior to extraction and after it was brought to final volume.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Definitions/Glossary

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

## Qualifiers

### LCMS

| Qualifier | Qualifier Description                                                               |
|-----------|-------------------------------------------------------------------------------------|
| U         | Undetected at the Limit of Detection.                                               |
| J         | Estimated: The analyte was positively identified; the quantitation is an estimation |
| M         | Manual integrated compound.                                                         |

## Glossary

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

## Sample Summary

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

| Lab Sample ID | Client Sample ID     | Matrix | Collected      | Received       |
|---------------|----------------------|--------|----------------|----------------|
| 320-41679-1   | WGNA-073118-RW-3785  | Water  | 07/31/18 08:40 | 08/01/18 09:45 |
| 320-41679-2   | WGNA-073118-FRB-3785 | Water  | 07/31/18 08:35 | 08/01/18 09:45 |
| 320-41679-3   | NAWC-073118-RW-154   | Water  | 07/31/18 10:10 | 08/01/18 09:45 |
| 320-41679-4   | NAWC-073118-FRB-154  | Water  | 07/31/18 10:05 | 08/01/18 09:45 |
| 320-41679-5   | NAWC-073118-RW-185   | Water  | 07/31/18 11:10 | 08/01/18 09:45 |
| 320-41679-6   | NAWC-073118-FRB-185  | Water  | 07/31/18 11:05 | 08/01/18 09:45 |
| 320-41679-7   | NAWC-073118-RW-179   | Water  | 07/31/18 12:10 | 08/01/18 09:45 |
| 320-41679-8   | NAWC-073118-FRB-179  | Water  | 07/31/18 12:05 | 08/01/18 09:45 |
| 320-41679-9   | NAWC-073118-RW-124   | Water  | 07/31/18 12:40 | 08/01/18 09:45 |
| 320-41679-10  | NAWC-073118-FRB-124  | Water  | 07/31/18 12:35 | 08/01/18 09:45 |
| 320-41679-11  | WGNA-073118-RW-3103  | Water  | 07/31/18 13:40 | 08/01/18 09:45 |
| 320-41679-12  | WGNA-073118-FRB-3103 | Water  | 07/31/18 13:35 | 08/01/18 09:45 |

# Method Summary

Client: Tetra Tech, Inc.  
Project/Site: WE04

TestAmerica Job ID: 320-41679-1

| Method | Method Description                       | Protocol | Laboratory |
|--------|------------------------------------------|----------|------------|
| 537    | Perfluorinated Alkyl Acids (LC/MS)       | EPA      | TAL SAC    |
| 537    | Extraction of Perfluorinated Alkyl Acids | EPA      | TAL SAC    |

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

FORM II  
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

| Client Sample ID            | Lab Sample ID         | PFHxA # | PFDA # |
|-----------------------------|-----------------------|---------|--------|
| WGNA-073118-RW-378<br>5     | 320-41679-1           | 88      | 103    |
| WGNA-073118-FRB-37<br>85    | 320-41679-2           | 86      | 97     |
| NAWC-073118-RW-154          | 320-41679-3           | 80      | 94     |
| NAWC-073118-FRB-15<br>4     | 320-41679-4           | 86      | 98     |
| NAWC-073118-RW-185          | 320-41679-5           | 81      | 94     |
| NAWC-073118-FRB-18<br>5     | 320-41679-6           | 98      | 103    |
| NAWC-073118-RW-179          | 320-41679-7           | 87      | 101    |
| NAWC-073118-FRB-17<br>9     | 320-41679-8           | 87      | 101    |
| NAWC-073118-RW-124          | 320-41679-9           | 83      | 94     |
| NAWC-073118-FRB-12<br>4     | 320-41679-10          | 87      | 91     |
| WGNA-073118-RW-310<br>3     | 320-41679-11          | 90      | 99     |
| WGNA-073118-FRB-31<br>03    | 320-41679-12          | 85      | 92     |
|                             | MB<br>320-237969/1-A  | 90      | 95     |
|                             | LCS<br>320-237969/2-A | 88      | 94     |
| WGNA-073118-RW-378<br>5 MS  | 320-41679-1 MS        | 90      | 98     |
| WGNA-073118-RW-378<br>5 MSD | 320-41679-1 MSD       | 86      | 99     |

PFHxA = 13C2 PFHxA  
PFDA = 13C2 PFDA

QC LIMITS  
70-130  
70-130

# Column to be used to flag recovery values

FORM III  
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2018.08.07\_537C\_024.d  
 Lab ID: LCS 320-237969/2-A Client ID: \_\_\_\_\_

| COMPOUND                             | SPIKE<br>ADDED<br>(ng/L) | LCS<br>CONCENTRATION<br>(ng/L) | LCS<br>%<br>REC | QC<br>LIMITS<br>REC | # |
|--------------------------------------|--------------------------|--------------------------------|-----------------|---------------------|---|
| Perfluorooctanesulfonic acid (PFOS)  | 132                      | 138                            | 104             | 70-130              |   |
| Perfluorooctanoic acid (PFOA)        | 66.0                     | 68.3                           | 103             | 70-130              |   |
| Perfluorononanoic acid (PFNA)        | 66.0                     | 64.4                           | 98              | 70-130              |   |
| Perfluorohexanesulfonic acid (PFHxS) | 100                      | 107                            | 107             | 70-130              |   |
| Perfluoroheptanoic acid (PFHpA)      | 32.0                     | 32.1                           | 100             | 70-130              |   |
| Perfluorobutanesulfonic acid (PFBS)  | 300                      | 321                            | 107             | 70-130              |   |

# Column to be used to flag recovery and RPD values

FORM III  
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2018.08.07\_537C\_026.d  
 Lab ID: 320-41679-1 MS Client ID: WGNA-073118-RW-3785 MS

| COMPOUND                             | SPIKE<br>ADDED<br>(ng/L) | SAMPLE<br>CONCENTRATION<br>(ng/L) | MS<br>CONCENTRATION<br>(ng/L) | MS<br>%<br>REC | QC<br>LIMITS<br>REC | # |
|--------------------------------------|--------------------------|-----------------------------------|-------------------------------|----------------|---------------------|---|
| Perfluorooctanesulfonic acid (PFOS)  | 131                      | 11 J                              | 146                           | 103            | 70-130              |   |
| Perfluorooctanoic acid (PFOA)        | 65.8                     | 16 J                              | 79.2                          | 97             | 70-130              |   |
| Perfluorononanoic acid (PFNA)        | 65.8                     | 21 U                              | 64.8                          | 99             | 70-130              |   |
| Perfluorohexanesulfonic acid (PFHxS) | 99.8                     | 15 J                              | 118                           | 103            | 70-130              |   |
| Perfluoroheptanoic acid (PFHpA)      | 31.9                     | 5.9 J                             | 34.3                          | 89             | 70-130              |   |
| Perfluorobutanesulfonic acid (PFBS)  | 299                      | 37 U                              | 325                           | 109            | 70-130              |   |

# Column to be used to flag recovery and RPD values



FORM III  
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2018.08.07\_537C\_027.d  
 Lab ID: 320-41679-1 MSD Client ID: WGNA-073118-RW-3785 MSD

| COMPOUND                             | SPIKE<br>ADDED<br>(ng/L) | MSD<br>CONCENTRATION<br>(ng/L) | MSD<br>%<br>REC | %<br>RPD | QC LIMITS |        | # |
|--------------------------------------|--------------------------|--------------------------------|-----------------|----------|-----------|--------|---|
|                                      |                          |                                |                 |          | RPD       | REC    |   |
| Perfluorooctanesulfonic acid (PFOS)  | 135                      | 151                            | 104             | 3        | 30        | 70-130 |   |
| Perfluorooctanoic acid (PFOA)        | 67.8                     | 80.0                           | 95              | 1        | 30        | 70-130 |   |
| Perfluorononanoic acid (PFNA)        | 67.8                     | 65.2                           | 96              | 1        | 30        | 70-130 |   |
| Perfluorohexanesulfonic acid (PFHxS) | 103                      | 120                            | 103             | 2        | 30        | 70-130 |   |
| Perfluoroheptanoic acid (PFHpA)      | 32.9                     | 35.1                           | 89              | 2        | 30        | 70-130 |   |
| Perfluorobutanesulfonic acid (PFBS)  | 308                      | 335                            | 109             | 3        | 30        | 70-130 |   |

# Column to be used to flag recovery and RPD values

FORM IV  
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Lab File ID: 2018.08.07\_537C\_023.d Lab Sample ID: MB 320-237969/1-A  
 Matrix: Water Date Extracted: 08/04/2018 08:24  
 Instrument ID: A8\_N Date Analyzed: 08/08/2018 04:40  
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

| CLIENT SAMPLE ID        | LAB SAMPLE ID      | LAB<br>FILE ID        | DATE ANALYZED    |
|-------------------------|--------------------|-----------------------|------------------|
|                         | LCS 320-237969/2-A | 2018.08.07_537C 024.d | 08/08/2018 04:45 |
| WGNA-073118-RW-3785     | 320-41679-1        | 2018.08.07_537C 025.d | 08/08/2018 04:50 |
| WGNA-073118-RW-3785 MS  | 320-41679-1 MS     | 2018.08.07_537C 026.d | 08/08/2018 04:55 |
| WGNA-073118-RW-3785 MSD | 320-41679-1 MSD    | 2018.08.07_537C 027.d | 08/08/2018 04:59 |
| WGNA-073118-FRB-3785    | 320-41679-2        | 2018.08.07_537C 028.d | 08/08/2018 05:04 |
| NAWC-073118-RW-154      | 320-41679-3        | 2018.08.07_537C 029.d | 08/08/2018 05:09 |
| NAWC-073118-FRB-154     | 320-41679-4        | 2018.08.07_537C 030.d | 08/08/2018 05:13 |
| NAWC-073118-RW-185      | 320-41679-5        | 2018.08.07_537C 031.d | 08/08/2018 05:18 |
| NAWC-073118-FRB-185     | 320-41679-6        | 2018.08.07_537C 032.d | 08/08/2018 05:23 |
| NAWC-073118-RW-179      | 320-41679-7        | 2018.08.07_537C 035.d | 08/08/2018 05:37 |
| NAWC-073118-FRB-179     | 320-41679-8        | 2018.08.07_537C 036.d | 08/08/2018 05:41 |
| NAWC-073118-RW-124      | 320-41679-9        | 2018.08.07_537C 037.d | 08/08/2018 05:46 |
| NAWC-073118-FRB-124     | 320-41679-10       | 2018.08.07_537C 038.d | 08/08/2018 05:51 |
| WGNA-073118-RW-3103     | 320-41679-11       | 2018.08.07_537C 039.d | 08/08/2018 05:55 |
| WGNA-073118-FRB-3103    | 320-41679-12       | 2018.08.07_537C 040.d | 08/08/2018 06:00 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

Client Sample ID: \_\_\_\_\_ Lab Sample ID: MB 320-237969/1-A

Matrix: Water Lab File ID: 2018.08.07\_537C\_023.d

Analysis Method: 537 Date Collected: \_\_\_\_\_

Extraction Method: 537 Date Extracted: 08/04/2018 08:24

Sample wt/vol: 250 (mL) Date Analyzed: 08/08/2018 04:40

Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1

Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)

% Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N

Analysis Batch No.: 238610 Units: ng/L

| CAS NO.   | COMPOUND NAME                        | RESULT | Q | LOQ | LOD | DL  |
|-----------|--------------------------------------|--------|---|-----|-----|-----|
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS)  | 16     | U | 40  | 16  | 6.8 |
| 335-67-1  | Perfluorooctanoic acid (PFOA)        | 8.0    | U | 20  | 8.0 | 2.8 |
| 375-95-1  | Perfluorononanoic acid (PFNA)        | 20     | U | 24  | 20  | 8.0 |
| 355-46-4  | Perfluorohexanesulfonic acid (PFHxS) | 12     | U | 30  | 12  | 5.5 |
| 375-85-9  | Perfluoroheptanoic acid (PFHpA)      | 4.0    | U | 10  | 4.0 | 1.9 |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS)  | 36     | U | 90  | 36  | 16  |

| CAS NO.  | SURROGATE  | %REC | Q | LIMITS |
|----------|------------|------|---|--------|
| STL00993 | 13C2 PFHxA | 90   |   | 70-130 |
| STL00996 | 13C2 PFDA  | 95   |   | 70-130 |

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A8\_N Calibration Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 08/07/2018 13:07  
 Calibration ID: 40513

|                                           |                            | 13PFOA  |      | PFOS    |      |        |      |
|-------------------------------------------|----------------------------|---------|------|---------|------|--------|------|
|                                           |                            | AREA #  | RT # | AREA #  | RT # | AREA # | RT # |
| INITIAL CALIBRATION MEAN AREA AND MEAN RT |                            | 1166146 | 1.77 | 2617368 | 2.02 |        |      |
| UPPER LIMIT                               |                            | 1749219 | 2.27 | 3926052 | 2.52 |        |      |
| LOWER LIMIT                               |                            | 583073  | 1.27 | 1308684 | 1.52 |        |      |
| LAB SAMPLE ID                             | CLIENT SAMPLE ID           |         |      |         |      |        |      |
| CCVL 320-238469/9                         |                            | 1156656 | 1.77 | 2655389 | 2.01 |        |      |
| ICV 320-238469/11                         |                            | 1199776 | 1.78 | 2744266 | 2.01 |        |      |
| CCVL 320-238776/1                         |                            | 1231833 | 1.76 | 2765004 | 2.00 |        |      |
| CCV 320-238610/1<br>CCVIS                 |                            | 1104849 | 1.76 | 2591082 | 1.99 |        |      |
| MB 320-237969/1-A                         |                            | 1310053 | 1.76 | 2893199 | 2.00 |        |      |
| LCS 320-237969/2-A                        |                            | 1249637 | 1.76 | 2724470 | 2.00 |        |      |
| 320-41679-1                               | WGNA-073118-RW-3785        | 1291243 | 1.76 | 2903279 | 2.00 |        |      |
| 320-41679-1 MS                            | WGNA-073118-RW-3785<br>MS  | 1422947 | 1.76 | 3131824 | 2.00 |        |      |
| 320-41679-1 MSD                           | WGNA-073118-RW-3785<br>MSD | 1410294 | 1.76 | 3025296 | 1.99 |        |      |
| 320-41679-2                               | WGNA-073118-FRB-3785       | 1318818 | 1.75 | 2897246 | 1.99 |        |      |
| 320-41679-3                               | NAWC-073118-RW-154         | 1216043 | 1.76 | 2589046 | 2.00 |        |      |
| 320-41679-4                               | NAWC-073118-FRB-154        | 1282240 | 1.75 | 2710739 | 1.99 |        |      |
| 320-41679-5                               | NAWC-073118-RW-185         | 1395103 | 1.75 | 2974332 | 1.98 |        |      |
| 320-41679-6                               | NAWC-073118-FRB-185        | 1180694 | 1.76 | 2717096 | 2.00 |        |      |
| CCV 320-238610/13<br>CCVIS                |                            | 1097335 | 1.76 | 2390195 | 2.00 |        |      |
| CCV 320-238612/13<br>CCVIS                |                            | 1097335 | 1.76 | 2390195 | 2.00 |        |      |
| 320-41679-7                               | NAWC-073118-RW-179         | 1328558 | 1.76 | 2933682 | 1.99 |        |      |
| 320-41679-8                               | NAWC-073118-FRB-179        | 1340148 | 1.76 | 2940104 | 1.99 |        |      |
| 320-41679-9                               | NAWC-073118-RW-124         | 1465526 | 1.76 | 3163107 | 2.00 |        |      |
| 320-41679-10                              | NAWC-073118-FRB-124        | 1319545 | 1.76 | 2963050 | 1.99 |        |      |
| 320-41679-11                              | WGNA-073118-RW-3103        | 1125238 | 1.75 | 2495650 | 1.99 |        |      |
| 320-41679-12                              | WGNA-073118-FRB-3103       | 1179781 | 1.76 | 2532682 | 1.99 |        |      |
| CCV 320-238612/21<br>CCVIS                |                            | 1095270 | 1.75 | 2475586 | 1.99 |        |      |

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 50%-150% of internal standard area

RT Limit =  $\pm$  0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-238610/1 Date Analyzed: 08/08/2018 04:31  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.08.07\_537C\_021 Heated Purge: (Y/N) N  
 Calibration ID: 40513

|                    |                            | 13PFOA  |      | PFOS    |      |        |      |
|--------------------|----------------------------|---------|------|---------|------|--------|------|
|                    |                            | AREA #  | RT # | AREA #  | RT # | AREA # | RT # |
| 12/24 HOUR STD     |                            | 1104849 | 1.76 | 2591082 | 1.99 |        |      |
| UPPER LIMIT        |                            | 1546789 | 2.26 | 3627515 | 2.49 |        |      |
| LOWER LIMIT        |                            | 773394  | 1.26 | 1813757 | 1.49 |        |      |
| LAB SAMPLE ID      | CLIENT SAMPLE ID           |         |      |         |      |        |      |
| MB 320-237969/1-A  |                            | 1310053 | 1.76 | 2893199 | 2.00 |        |      |
| LCS 320-237969/2-A |                            | 1249637 | 1.76 | 2724470 | 2.00 |        |      |
| 320-41679-1        | WGNA-073118-RW-3785        | 1291243 | 1.76 | 2903279 | 2.00 |        |      |
| 320-41679-1 MS     | WGNA-073118-RW-3785<br>MS  | 1422947 | 1.76 | 3131824 | 2.00 |        |      |
| 320-41679-1 MSD    | WGNA-073118-RW-3785<br>MSD | 1410294 | 1.76 | 3025296 | 1.99 |        |      |
| 320-41679-2        | WGNA-073118-FRB-3785       | 1318818 | 1.75 | 2897246 | 1.99 |        |      |
| 320-41679-3        | NAWC-073118-RW-154         | 1216043 | 1.76 | 2589046 | 2.00 |        |      |
| 320-41679-4        | NAWC-073118-FRB-154        | 1282240 | 1.75 | 2710739 | 1.99 |        |      |
| 320-41679-5        | NAWC-073118-RW-185         | 1395103 | 1.75 | 2974332 | 1.98 |        |      |
| 320-41679-6        | NAWC-073118-FRB-185        | 1180694 | 1.76 | 2717096 | 2.00 |        |      |

13PFOA = 13C2-PFOA  
 13PFOA = 13C2-PFOA  
 PFOS = 13C4 PFOS  
 PFOS = 13C4 PFOS  
 Area Limit = 70%-140% of internal standard area  
 RT Limit = ± 0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-238610/13 Date Analyzed: 08/08/2018 05:27  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.08.07\_537C\_033 Heated Purge: (Y/N) N  
 Calibration ID: 40513

|                    |                            | 13PFOA  |      | PFOS    |      |        |      |
|--------------------|----------------------------|---------|------|---------|------|--------|------|
|                    |                            | AREA #  | RT # | AREA #  | RT # | AREA # | RT # |
| 12/24 HOUR STD     |                            | 1097335 | 1.76 | 2390195 | 2.00 |        |      |
| UPPER LIMIT        |                            | 1536269 | 2.26 | 3346273 | 2.50 |        |      |
| LOWER LIMIT        |                            | 768135  | 1.26 | 1673137 | 1.50 |        |      |
| LAB SAMPLE ID      | CLIENT SAMPLE ID           |         |      |         |      |        |      |
| MB 320-237969/1-A  |                            | 1310053 | 1.76 | 2893199 | 2.00 |        |      |
| LCS 320-237969/2-A |                            | 1249637 | 1.76 | 2724470 | 2.00 |        |      |
| 320-41679-1        | WGNA-073118-RW-3785        | 1291243 | 1.76 | 2903279 | 2.00 |        |      |
| 320-41679-1 MS     | WGNA-073118-RW-3785<br>MS  | 1422947 | 1.76 | 3131824 | 2.00 |        |      |
| 320-41679-1 MSD    | WGNA-073118-RW-3785<br>MSD | 1410294 | 1.76 | 3025296 | 1.99 |        |      |
| 320-41679-2        | WGNA-073118-FRB-3785       | 1318818 | 1.75 | 2897246 | 1.99 |        |      |
| 320-41679-3        | NAWC-073118-RW-154         | 1216043 | 1.76 | 2589046 | 2.00 |        |      |
| 320-41679-4        | NAWC-073118-FRB-154        | 1282240 | 1.75 | 2710739 | 1.99 |        |      |
| 320-41679-5        | NAWC-073118-RW-185         | 1395103 | 1.75 | 2974332 | 1.98 |        |      |
| 320-41679-6        | NAWC-073118-FRB-185        | 1180694 | 1.76 | 2717096 | 2.00 |        |      |

13PFOA = 13C2-PFOA  
 13PFOA = 13C2-PFOA  
 PFOS = 13C4 PFOS  
 PFOS = 13C4 PFOS  
 Area Limit = 70%-140% of internal standard area  
 RT Limit =  $\pm 0.5$  minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-238612/13 Date Analyzed: 08/08/2018 05:27  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.08.07\_537C\_033 Heated Purge: (Y/N) N  
 Calibration ID: 40513

|                | 13PFOA               |      | PFOS    |      |         |      |
|----------------|----------------------|------|---------|------|---------|------|
|                | AREA #               | RT # | AREA #  | RT # | AREA #  | RT # |
| 12/24 HOUR STD | 1097335              | 1.76 | 2390195 | 2.00 |         |      |
| UPPER LIMIT    | 1536269              | 2.26 | 3346273 | 2.50 |         |      |
| LOWER LIMIT    | 768135               | 1.26 | 1673137 | 1.50 |         |      |
| LAB SAMPLE ID  | CLIENT SAMPLE ID     |      |         |      |         |      |
| 320-41679-7    | NAWC-073118-RW-179   |      | 1328558 | 1.76 | 2933682 | 1.99 |
| 320-41679-8    | NAWC-073118-FRB-179  |      | 1340148 | 1.76 | 2940104 | 1.99 |
| 320-41679-9    | NAWC-073118-RW-124   |      | 1465526 | 1.76 | 3163107 | 2.00 |
| 320-41679-10   | NAWC-073118-FRB-124  |      | 1319545 | 1.76 | 2963050 | 1.99 |
| 320-41679-11   | WGNA-073118-RW-3103  |      | 1125238 | 1.75 | 2495650 | 1.99 |
| 320-41679-12   | WGNA-073118-FRB-3103 |      | 1179781 | 1.76 | 2532682 | 1.99 |

13PFOA = 13C2-PFOA  
 13PFOA = 13C2-PFOA  
 PFOS = 13C4 PFOS  
 PFOS = 13C4 PFOS  
 Area Limit = 70%-140% of internal standard area  
 RT Limit = ± 0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-238612/21 Date Analyzed: 08/08/2018 06:05  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.08.07\_537C\_041 Heated Purge: (Y/N) N  
 Calibration ID: 40513

|                |                      | 13PFOA  |      | PFOS    |      |        |      |
|----------------|----------------------|---------|------|---------|------|--------|------|
|                |                      | AREA #  | RT # | AREA #  | RT # | AREA # | RT # |
| 12/24 HOUR STD |                      | 1095270 | 1.75 | 2475586 | 1.99 |        |      |
| UPPER LIMIT    |                      | 1533378 | 2.25 | 3465820 | 2.49 |        |      |
| LOWER LIMIT    |                      | 766689  | 1.25 | 1732910 | 1.49 |        |      |
| LAB SAMPLE ID  | CLIENT SAMPLE ID     |         |      |         |      |        |      |
| 320-41679-7    | NAWC-073118-RW-179   | 1328558 | 1.76 | 2933682 | 1.99 |        |      |
| 320-41679-8    | NAWC-073118-FRB-179  | 1340148 | 1.76 | 2940104 | 1.99 |        |      |
| 320-41679-9    | NAWC-073118-RW-124   | 1465526 | 1.76 | 3163107 | 2.00 |        |      |
| 320-41679-10   | NAWC-073118-FRB-124  | 1319545 | 1.76 | 2963050 | 1.99 |        |      |
| 320-41679-11   | WGNA-073118-RW-3103  | 1125238 | 1.75 | 2495650 | 1.99 |        |      |
| 320-41679-12   | WGNA-073118-FRB-3103 | 1179781 | 1.76 | 2532682 | 1.99 |        |      |

13PFOA = 13C2-PFOA  
 13PFOA = 13C2-PFOA  
 PFOS = 13C4 PFOS  
 PFOS = 13C4 PFOS  
 Area Limit = 70%-140% of internal standard area  
 RT Limit = ± 0.5 minutes of internal standard RT

# Column used to flag values outside QC limits



FORM VI  
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA  
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1 Analy Batch No.: 238469

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

|         |                 |                           |
|---------|-----------------|---------------------------|
| LEVEL:  | LAB SAMPLE ID:  | LAB FILE ID:              |
| Level 1 | IC 320-238469/2 | 2018.08.07_537CURVE_003.d |
| Level 2 | IC 320-238469/3 | 2018.08.07_537CURVE_004.d |
| Level 3 | IC 320-238469/4 | 2018.08.07_537CURVE_005.d |
| Level 4 | IC 320-238469/5 | 2018.08.07_537CURVE_006.d |
| Level 5 | IC 320-238469/6 | 2018.08.07_537CURVE_007.d |
| Level 6 | IC 320-238469/7 | 2018.08.07_537CURVE_008.d |

| ANALYTE                              | RRF              |        |        |        |        | CURVE<br>TYPE | COEFFICIENT |        |    | # | MIN RRF | %RSD | # | MAX<br>%RSD | R^2<br>OR COD | # | MIN R^2<br>OR COD |
|--------------------------------------|------------------|--------|--------|--------|--------|---------------|-------------|--------|----|---|---------|------|---|-------------|---------------|---|-------------------|
|                                      | LVL 1<br>LVL 6   | LVL 2  | LVL 3  | LVL 4  | LVL 5  |               | B           | M1     | M2 |   |         |      |   |             |               |   |                   |
| Perfluorobutanesulfonic acid (PFBS)  | 1.2685<br>1.0148 | 1.2167 | 1.2831 | 1.2045 | 1.1178 | Ave           |             | 1.1842 |    |   |         | 8.6  |   | 30.0        |               |   |                   |
| Perfluorohexanesulfonic acid (PFHxS) | 1.7386<br>1.7965 | 1.7248 | 1.7859 | 1.8499 | 1.8020 | Ave           |             | 1.7830 |    |   |         | 2.6  |   | 30.0        |               |   |                   |
| Perfluoroheptanoic acid (PFHpA)      | ++++<br>1.0701   | 1.0598 | 1.0963 | 1.0908 | 1.0612 | Ave           |             | 1.0756 |    |   |         | 1.6  |   | 30.0        |               |   |                   |
| Perfluorooctanoic acid (PFOA)        | 1.1708<br>1.0787 | 1.0454 | 1.0799 | 1.1146 | 1.0831 | Ave           |             | 1.0954 |    |   |         | 3.9  |   | 30.0        |               |   |                   |
| Perfluorooctanesulfonic acid (PFOS)  | 1.0605<br>1.1104 | 1.0466 | 1.1058 | 1.0956 | 1.1304 | Ave           |             | 1.0915 |    |   |         | 2.9  |   | 30.0        |               |   |                   |
| Perfluorononanoic acid (PFNA)        | 0.7952<br>0.7829 | 0.7632 | 0.7779 | 0.8207 | 0.7892 | Ave           |             | 0.7882 |    |   |         | 2.5  |   | 30.0        |               |   |                   |
| 13C2 PFHxA                           | 1.1215<br>1.1209 | 1.0683 | 1.0729 | 1.1134 | 1.1007 | Ave           |             | 1.0996 |    |   |         | 2.2  |   | 30.0        |               |   |                   |
| 13C2 PFDA                            | 0.8149<br>0.8273 | 0.8350 | 0.7672 | 0.8515 | 0.8172 | Ave           |             | 0.8189 |    |   |         | 3.5  |   | 30.0        |               |   |                   |

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI  
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA  
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1 Analy Batch No.: 238469

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

|         |                 |                           |
|---------|-----------------|---------------------------|
| LEVEL:  | LAB SAMPLE ID:  | LAB FILE ID:              |
| Level 1 | IC 320-238469/2 | 2018.08.07_537CURVE_003.d |
| Level 2 | IC 320-238469/3 | 2018.08.07_537CURVE_004.d |
| Level 3 | IC 320-238469/4 | 2018.08.07_537CURVE_005.d |
| Level 4 | IC 320-238469/5 | 2018.08.07_537CURVE_006.d |
| Level 5 | IC 320-238469/6 | 2018.08.07_537CURVE_007.d |
| Level 6 | IC 320-238469/7 | 2018.08.07_537CURVE_008.d |

| ANALYTE                                 | IS<br>REF  | CURVE<br>TYPE | RESPONSE            |         |         |         |          | CONCENTRATION (NG/ML) |       |       |       |       |
|-----------------------------------------|------------|---------------|---------------------|---------|---------|---------|----------|-----------------------|-------|-------|-------|-------|
|                                         |            |               | LVL 1<br>LVL 6      | LVL 2   | LVL 3   | LVL 4   | LVL 5    | LVL 1<br>LVL 6        | LVL 2 | LVL 3 | LVL 4 | LVL 5 |
| Perfluorobutanesulfonic acid (PFBS)     | PFOS       | Ave           | 1093854<br>16487048 | 2326382 | 5241287 | 9203217 | 13659010 | 9.00<br>180           | 20.0  | 45.0  | 90.1  | 135   |
| Perfluorohexanesulfonic acid<br>(PFHxS) | PFOS       | Ave           | 500314<br>9803009   | 1107645 | 2450188 | 4747515 | 7395512  | 3.00<br>60.5          | 6.72  | 15.1  | 30.2  | 45.4  |
| Perfluoroheptanoic acid (PFHpA)         | 13PF<br>OA | Ave           | ++++<br>2459664     | 275735  | 621773  | 1128009 | 1828933  | ++++<br>19.4          | 2.16  | 4.86  | 9.72  | 14.6  |
| Perfluorooctanoic acid (PFOA)           | 13PF<br>OA | Ave           | 277484<br>5050799   | 554036  | 1247621 | 2347790 | 3802739  | 1.98<br>39.6          | 4.40  | 9.90  | 19.8  | 29.7  |
| Perfluorooctanesulfonic acid (PFOS)     | PFOS       | Ave           | 401757<br>7918924   | 878368  | 1982811 | 3674504 | 6063022  | 3.95<br>79.1          | 8.79  | 19.8  | 39.5  | 59.3  |
| Perfluorononanoic acid (PFNA)           | 13PF<br>OA | Ave           | 188460<br>3665889   | 404484  | 898787  | 1728770 | 2770632  | 1.98<br>39.6          | 4.40  | 9.90  | 19.8  | 29.7  |
| 13C2 PFHxA                              | 13PF<br>OA | Ave           | 1342383<br>1325342  | 1286815 | 1252048 | 1184544 | 1301097  | 10.0<br>10.0          | 10.0  | 10.0  | 10.0  | 10.0  |
| 13C2 PFDA                               | 13PF<br>OA | Ave           | 975454<br>978205    | 1005796 | 895349  | 905914  | 965975   | 10.0<br>10.0          | 10.0  | 10.0  | 10.0  | 10.0  |

Curve Type Legend:

Ave = Average ISTD

FORM VI  
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA  
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1 Analy Batch No.: 238469

SDG No.: \_\_\_\_\_

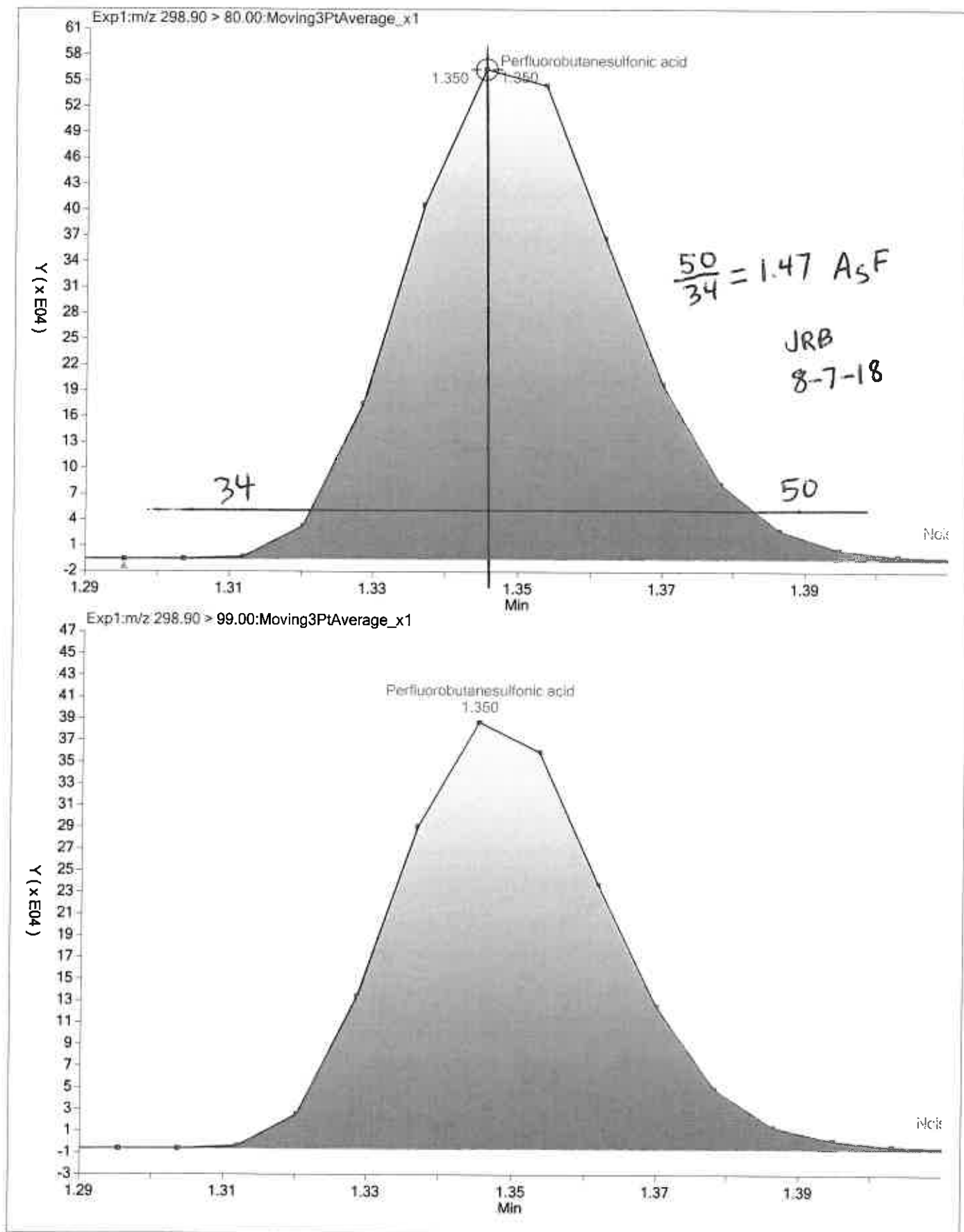
Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

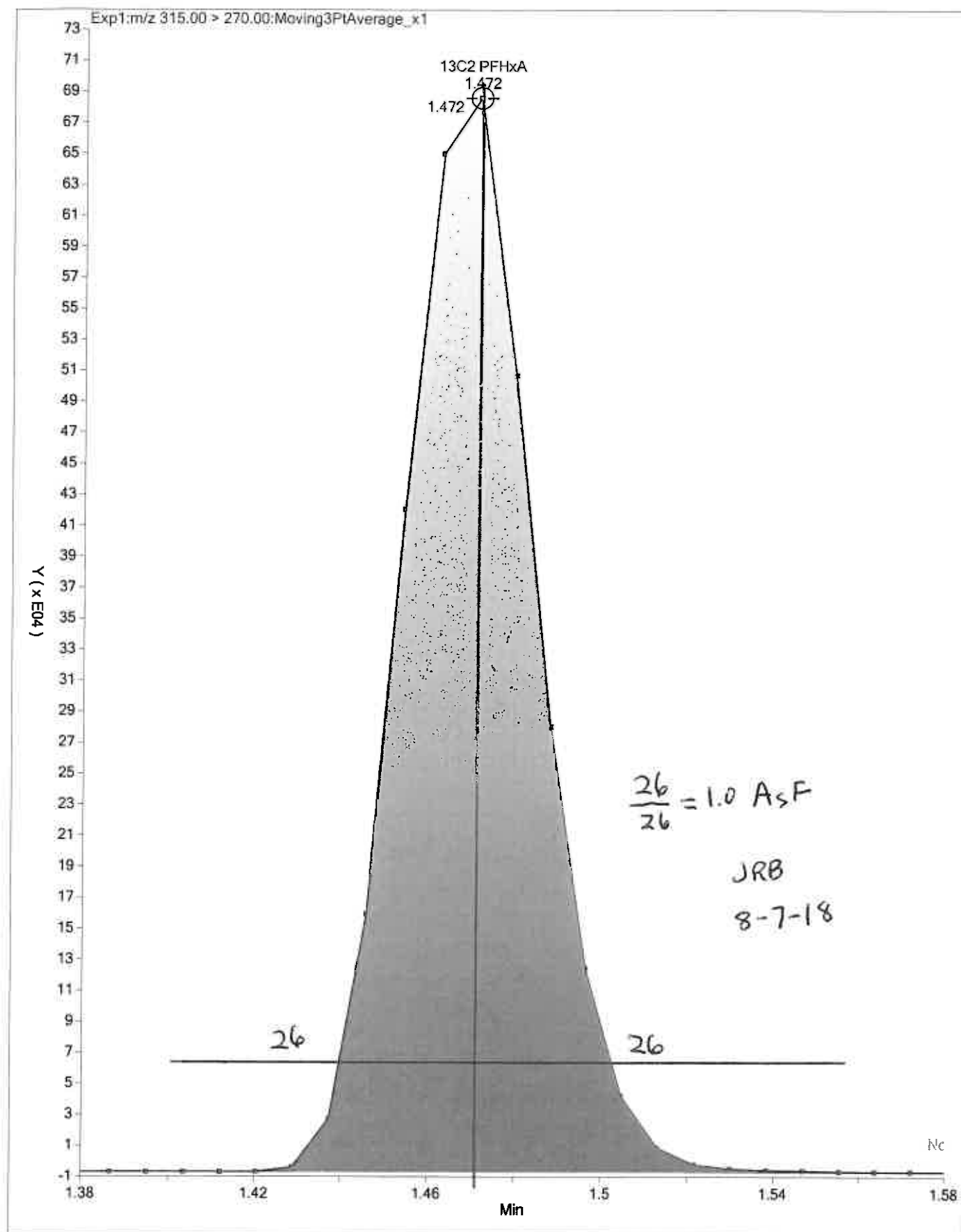
Calibration Start Date: 08/07/2018 12:44 Calibration End Date: 08/07/2018 13:07 Calibration ID: 40513

Calibration Files:

| LEVEL:  | LAB SAMPLE ID:  | LAB FILE ID:              |
|---------|-----------------|---------------------------|
| Level 1 | IC 320-238469/2 | 2018.08.07_537CURVE_003.d |
| Level 2 | IC 320-238469/3 | 2018.08.07_537CURVE_004.d |
| Level 3 | IC 320-238469/4 | 2018.08.07_537CURVE_005.d |
| Level 4 | IC 320-238469/5 | 2018.08.07_537CURVE_006.d |
| Level 5 | IC 320-238469/6 | 2018.08.07_537CURVE_007.d |
| Level 6 | IC 320-238469/7 | 2018.08.07_537CURVE_008.d |

| ANALYTE                              | PERCENT ERROR |         |         |         |         |         | PERCENT ERROR LIMIT |       |       |       |       |       |
|--------------------------------------|---------------|---------|---------|---------|---------|---------|---------------------|-------|-------|-------|-------|-------|
|                                      | LVL 1 #       | LVL 2 # | LVL 3 # | LVL 4 # | LVL 5 # | LVL 6 # | LVL 1               | LVL 2 | LVL 3 | LVL 4 | LVL 5 | LVL 6 |
| Perfluorobutanesulfonic acid (PFBS)  | 7.1           | 2.7     | 8.3     | 1.7     | -5.6    | -14.3   | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluorohexanesulfonic acid (PFHxS) | -2.5          | -3.3    | 0.2     | 3.8     | 1.1     | 0.8     | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluoroheptanoic acid (PFHpA)      | +++++         | -1.5    | 1.9     | 1.4     | -1.3    | -0.5    |                     | 50    | 30    | 30    | 30    | 30    |
| Perfluorooctanoic acid (PFOA)        | 6.9           | -4.6    | -1.4    | 1.7     | -1.1    | -1.5    | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluorooctanesulfonic acid (PFOS)  | -2.8          | -4.1    | 1.3     | 0.4     | 3.6     | 1.7     | 50                  | 30    | 30    | 30    | 30    | 30    |
| Perfluorononanoic acid (PFNA)        | 0.9           | -3.2    | -1.3    | 4.1     | 0.1     | -0.7    | 50                  | 30    | 30    | 30    | 30    | 30    |
| 13C2 PFHxA                           | 2.0           | -2.8    | -2.4    | 1.3     | 0.1     | 1.9     | 30                  | 30    | 30    | 30    | 30    | 30    |
| 13C2 PFDA                            | -0.5          | 2.0     | -6.3    | 4.0     | -0.2    | 1.0     | 30                  | 30    | 30    | 30    | 30    | 30    |





FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-238469/9 Calibration Date: 08/07/2018 13:16  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537CURVE\_010.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | Ave           | 1.184   | 1.259  |         | 21.3           | 20.0            | 6.3  | 50.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 1.076   | 1.049  |         | 2.11           | 2.16            | -2.5 | 50.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.783   | 1.727  |         | 6.51           | 6.72            | -3.2 | 50.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 1.095   | 1.051  |         | 4.22           | 4.40            | -4.1 | 50.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 1.092   | 1.042  |         | 8.39           | 8.79            | -4.5 | 50.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.7882  | 0.7696 |         | 4.30           | 4.40            | -2.4 | 50.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.095  |         | 9.96           | 10.0            | -0.4 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.8189  | 0.8007 |         | 9.78           | 10.0            | -2.2 | 30.0      |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: ICV 320-238469/11 Calibration Date: 08/07/2018 13:26  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537CURVE\_012.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D    | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|-------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | Ave           | 1.184   | 0.997  |         | 84.2           | 100             | -15.8 | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 1.076   | 0.9540 |         | 8.87           | 10.0            | -11.3 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.783   | 1.603  |         | 18.1           | 20.2            | -10.1 | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 1.095   | 0.9056 |         | 16.7           | 20.2            | -17.3 | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 1.092   | 0.9574 |         | 17.7           | 20.2            | -12.3 | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.7882  | 0.7380 |         | 18.9           | 20.2            | -6.4  | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.045  |         | 9.51           | 10.0            | -4.9  | 30.0      |
| 13C2 PFDA                               | Ave           | 0.8189  | 0.7952 |         | 9.71           | 10.0            | -2.9  | 30.0      |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-238776/1 Calibration Date: 08/08/2018 03:07  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537C\_003.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | Ave           | 1.184   | 1.243  |         | 21.0           | 20.0            | 4.9  | 50.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 1.076   | 1.031  |         | 2.07           | 2.16            | -4.2 | 50.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.783   | 1.702  |         | 6.42           | 6.72            | -4.5 | 50.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 1.095   | 1.034  |         | 4.15           | 4.40            | -5.6 | 50.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 1.092   | 1.067  |         | 8.59           | 8.79            | -2.2 | 50.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.7882  | 0.7564 |         | 4.22           | 4.40            | -4.0 | 50.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.051  |         | 9.56           | 10.0            | -4.4 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.8189  | 0.7584 |         | 9.26           | 10.0            | -7.4 | 30.0      |



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-238610/1 Calibration Date: 08/08/2018 04:31  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537C\_021.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | Ave           | 1.184   | 1.228  |         | 46.7           | 45.0            | 3.7  | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 1.076   | 1.077  |         | 4.87           | 4.86            | 0.2  | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.783   | 1.742  |         | 14.8           | 15.1            | -2.3 | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 1.095   | 1.069  |         | 9.66           | 9.90            | -2.4 | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 1.092   | 1.062  |         | 19.2           | 19.8            | -2.7 | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.7882  | 0.8206 |         | 10.3           | 9.90            | 4.1  | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.088  |         | 9.89           | 10.0            | -1.1 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.8189  | 0.7990 |         | 9.76           | 10.0            | -2.4 | 30.0      |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-238610/13 Calibration Date: 08/08/2018 05:27  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537C\_033.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | Ave           | 1.184   | 1.165  |         | 133            | 135             | -1.6 | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 1.076   | 1.063  |         | 14.4           | 14.6            | -1.2 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.783   | 1.839  |         | 46.8           | 45.4            | 3.1  | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 1.095   | 1.094  |         | 29.7           | 29.7            | -0.0 | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 1.092   | 1.131  |         | 61.4           | 59.3            | 3.6  | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.7882  | 0.7713 |         | 29.1           | 29.7            | -2.1 | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.074  |         | 9.77           | 10.0            | -2.3 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.8189  | 0.8057 |         | 9.84           | 10.0            | -1.6 | 30.0      |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-238612/13 Calibration Date: 08/08/2018 05:27  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537C\_033.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | Ave           | 1.184   | 1.165  |         | 133            | 135             | -1.6 | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 1.076   | 1.063  |         | 14.4           | 14.6            | -1.2 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.783   | 1.839  |         | 46.8           | 45.4            | 3.1  | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 1.095   | 1.094  |         | 29.7           | 29.7            | -0.0 | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 1.092   | 1.131  |         | 61.4           | 59.3            | 3.6  | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.7882  | 0.7713 |         | 29.1           | 29.7            | -2.1 | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.074  |         | 9.77           | 10.0            | -2.3 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.8189  | 0.8057 |         | 9.84           | 10.0            | -1.6 | 30.0      |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-238612/21 Calibration Date: 08/08/2018 06:05  
 Instrument ID: A8\_N Calib Start Date: 08/07/2018 12:44  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/07/2018 13:07  
 Lab File ID: 2018.08.07\_537C\_041.d Conc. Units: ng/mL

| ANALYTE                                 | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------------------------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| Perfluorobutanesulfonic acid<br>(PFBS)  | Ave           | 1.184   | 1.278  |         | 48.6           | 45.0            | 7.9  | 30.0      |
| Perfluoroheptanoic acid<br>(PFHpA)      | Ave           | 1.076   | 1.067  |         | 4.82           | 4.86            | -0.8 | 30.0      |
| Perfluorohexanesulfonic acid<br>(PFHxS) | Ave           | 1.783   | 1.744  |         | 14.8           | 15.1            | -2.2 | 30.0      |
| Perfluorooctanoic acid<br>(PFOA)        | Ave           | 1.095   | 1.044  |         | 9.44           | 9.90            | -4.7 | 30.0      |
| Perfluorooctanesulfonic acid<br>(PFOS)  | Ave           | 1.092   | 1.080  |         | 19.6           | 19.8            | -1.0 | 30.0      |
| Perfluorononanoic acid<br>(PFNA)        | Ave           | 0.7882  | 0.7579 |         | 9.52           | 9.90            | -3.8 | 30.0      |
| 13C2 PFHxA                              | Ave           | 1.100   | 1.058  |         | 9.62           | 10.0            | -3.8 | 30.0      |
| 13C2 PFDA                               | Ave           | 0.8189  | 0.7925 |         | 9.68           | 10.0            | -3.2 | 30.0      |

## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-41679-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_NStart Date: 08/07/2018 12:44Analysis Batch Number: 238469End Date: 08/07/2018 13:26

| LAB SAMPLE ID             | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID                   | COLUMN ID             |
|---------------------------|------------------|------------------|--------------------|-------------------------------|-----------------------|
| IC 320-238469/2           |                  | 08/07/2018 12:44 | 1                  | 2018.08.07_537C<br>URVE 003.d | GeminiC18 3x100 3(mm) |
| IC 320-238469/3           |                  | 08/07/2018 12:48 | 1                  | 2018.08.07_537C<br>URVE 004.d | GeminiC18 3x100 3(mm) |
| IC 320-238469/4           |                  | 08/07/2018 12:53 | 1                  | 2018.08.07_537C<br>URVE 005.d | GeminiC18 3x100 3(mm) |
| IC 320-238469/5<br>ICISAV |                  | 08/07/2018 12:58 | 1                  | 2018.08.07_537C<br>URVE 006.d | GeminiC18 3x100 3(mm) |
| IC 320-238469/6           |                  | 08/07/2018 13:02 | 1                  | 2018.08.07_537C<br>URVE 007.d | GeminiC18 3x100 3(mm) |
| IC 320-238469/7           |                  | 08/07/2018 13:07 | 1                  | 2018.08.07_537C<br>URVE 008.d | GeminiC18 3x100 3(mm) |
| ZZZZZ                     |                  | 08/07/2018 13:12 | 1                  |                               | GeminiC18 3x100 3(mm) |
| CCVL 320-238469/9         |                  | 08/07/2018 13:16 | 1                  | 2018.08.07_537C<br>URVE 010.d | GeminiC18 3x100 3(mm) |
| ICB 320-238469/10         |                  | 08/07/2018 13:21 | 1                  |                               | GeminiC18 3x100 3(mm) |
| ICV 320-238469/11         |                  | 08/07/2018 13:26 | 1                  | 2018.08.07_537C<br>URVE 012.d | GeminiC18 3x100 3(mm) |

## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-41679-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_NStart Date: 08/08/2018 04:31Analysis Batch Number: 238610End Date: 08/08/2018 05:27

| LAB SAMPLE ID              | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID              | COLUMN ID             |
|----------------------------|------------------|------------------|--------------------|--------------------------|-----------------------|
| CCV 320-238610/1<br>CCVIS  |                  | 08/08/2018 04:31 | 1                  | 2018.08.07_537C<br>021.d | GeminiC18 3x100 3(mm) |
| ZZZZZ                      |                  | 08/08/2018 04:36 | 1                  |                          | GeminiC18 3x100 3(mm) |
| MB 320-237969/1-A          |                  | 08/08/2018 04:40 | 1                  | 2018.08.07_537C<br>023.d | GeminiC18 3x100 3(mm) |
| LCS 320-237969/2-A         |                  | 08/08/2018 04:45 | 1                  | 2018.08.07_537C<br>024.d | GeminiC18 3x100 3(mm) |
| 320-41679-1                |                  | 08/08/2018 04:50 | 1                  | 2018.08.07_537C<br>025.d | GeminiC18 3x100 3(mm) |
| 320-41679-1 MS             |                  | 08/08/2018 04:55 | 1                  | 2018.08.07_537C<br>026.d | GeminiC18 3x100 3(mm) |
| 320-41679-1 MSD            |                  | 08/08/2018 04:59 | 1                  | 2018.08.07_537C<br>027.d | GeminiC18 3x100 3(mm) |
| 320-41679-2                |                  | 08/08/2018 05:04 | 1                  | 2018.08.07_537C<br>028.d | GeminiC18 3x100 3(mm) |
| 320-41679-3                |                  | 08/08/2018 05:09 | 1                  | 2018.08.07_537C<br>029.d | GeminiC18 3x100 3(mm) |
| 320-41679-4                |                  | 08/08/2018 05:13 | 1                  | 2018.08.07_537C<br>030.d | GeminiC18 3x100 3(mm) |
| 320-41679-5                |                  | 08/08/2018 05:18 | 1                  | 2018.08.07_537C<br>031.d | GeminiC18 3x100 3(mm) |
| 320-41679-6                |                  | 08/08/2018 05:23 | 1                  | 2018.08.07_537C<br>032.d | GeminiC18 3x100 3(mm) |
| CCV 320-238610/13<br>CCVIS |                  | 08/08/2018 05:27 | 1                  | 2018.08.07_537C<br>033.d | GeminiC18 3x100 3(mm) |

## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Start Date: 08/08/2018 05:27Analysis Batch Number: 238612 End Date: 08/08/2018 06:05

| LAB SAMPLE ID              | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID              | COLUMN ID             |
|----------------------------|------------------|------------------|--------------------|--------------------------|-----------------------|
| CCV 320-238612/13<br>CCVIS |                  | 08/08/2018 05:27 | 1                  | 2018.08.07_537C<br>033.d | GeminiC18 3x100 3(mm) |
| ZZZZZ                      |                  | 08/08/2018 05:32 | 1                  |                          | GeminiC18 3x100 3(mm) |
| 320-41679-7                |                  | 08/08/2018 05:37 | 1                  | 2018.08.07_537C<br>035.d | GeminiC18 3x100 3(mm) |
| 320-41679-8                |                  | 08/08/2018 05:41 | 1                  | 2018.08.07_537C<br>036.d | GeminiC18 3x100 3(mm) |
| 320-41679-9                |                  | 08/08/2018 05:46 | 1                  | 2018.08.07_537C<br>037.d | GeminiC18 3x100 3(mm) |
| 320-41679-10               |                  | 08/08/2018 05:51 | 1                  | 2018.08.07_537C<br>038.d | GeminiC18 3x100 3(mm) |
| 320-41679-11               |                  | 08/08/2018 05:55 | 1                  | 2018.08.07_537C<br>039.d | GeminiC18 3x100 3(mm) |
| 320-41679-12               |                  | 08/08/2018 06:00 | 1                  | 2018.08.07_537C<br>040.d | GeminiC18 3x100 3(mm) |
| CCV 320-238612/21<br>CCVIS |                  | 08/08/2018 06:05 | 1                  | 2018.08.07_537C<br>041.d | GeminiC18 3x100 3(mm) |

## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Start Date: 08/08/2018 03:07Analysis Batch Number: 238776 End Date: 08/08/2018 03:44

| LAB SAMPLE ID             | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID              | COLUMN ID             |
|---------------------------|------------------|------------------|--------------------|--------------------------|-----------------------|
| CCVL 320-238776/1         |                  | 08/08/2018 03:07 | 1                  | 2018.08.07_537C<br>003.d | GeminiC18 3x100 3(mm) |
| CCV 320-238776/9<br>CCVIS |                  | 08/08/2018 03:44 | 1                  |                          | GeminiC18 3x100 3(mm) |



## LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

Batch Number: 237969 Batch Start Date: 08/04/18 08:23 Batch Analyst: Kouchari, ShamiranBatch Method: 537 Batch End Date: 08/06/18 16:10

| Lab Sample ID    | Client Sample ID     | Method Chain | Basis | GrossWeight | TareWeight | InitialAmount | FinalAmount | ReceivedpH | LC537-IS 00077 |
|------------------|----------------------|--------------|-------|-------------|------------|---------------|-------------|------------|----------------|
| MB 320-237969/1  |                      | 537, 537     |       |             |            | 250 mL        | 1.00 mL     | 7 SU       | 100 uL         |
| LCS 320-237969/2 |                      | 537, 537     |       |             |            | 250 mL        | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-1    | WGNA-073118-RW-3785  | 537, 537     | T     | 268.98 g    | 28.72 g    | 240.3 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-1    | WGNA-073118-RW-3785  | 537, 537     | T     | 280.33 g    | 29.49 g    | 250.8 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-1    | WGNA-073118-RW-3785  | 537, 537     | T     | 272.17 g    | 28.72 g    | 243.5 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-2    | WGNA-073118-FRB-3785 | 537, 537     | T     | 290.25 g    | 28.58 g    | 261.7 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-3    | NAWC-073118-RW-154   | 537, 537     | T     | 283.01 g    | 28.71 g    | 254.3 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-4    | NAWC-073118-FRB-154  | 537, 537     | T     | 286.19 g    | 28.51 g    | 257.7 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-5    | NAWC-073118-RW-185   | 537, 537     | T     | 294.61 g    | 28.72 g    | 265.9 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-6    | NAWC-073118-FRB-185  | 537, 537     | T     | 273.79 g    | 29.21 g    | 244.6 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-7    | NAWC-073118-RW-179   | 537, 537     | T     | 287.71 g    | 29.85 g    | 257.9 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-8    | NAWC-073118-FRB-179  | 537, 537     | T     | 283.90 g    | 31.05 g    | 252.9 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-9    | NAWC-073118-RW-124   | 537, 537     | T     | 283.41 g    | 29.69 g    | 253.7 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-10   | NAWC-073118-FRB-124  | 537, 537     | T     | 283.12 g    | 28.63 g    | 254.5 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-11   | WGNA-073118-RW-3103  | 537, 537     | T     | 288.10 g    | 28.95 g    | 259.2 mL      | 1.00 mL     | 7 SU       | 100 uL         |
| 320-41679-A-12   | WGNA-073118-FRB-3103 | 537, 537     | T     | 289.49 g    | 28.81 g    | 260.7 mL      | 1.00 mL     | 7 SU       | 100 uL         |

| Lab Sample ID    | Client Sample ID    | Method Chain | Basis | LC537-MSP 00033 | LC537-SU 00074 | AnalysisComment |  |  |  |
|------------------|---------------------|--------------|-------|-----------------|----------------|-----------------|--|--|--|
| MB 320-237969/1  |                     | 537, 537     |       |                 | 100 uL         | Chlorine, ND    |  |  |  |
| LCS 320-237969/2 |                     | 537, 537     |       | 100 uL          | 100 uL         | Chlorine, ND    |  |  |  |
| 320-41679-A-1    | WGNA-073118-RW-3785 | 537, 537     | T     |                 | 100 uL         | Chlorine, ND    |  |  |  |
| 320-41679-A-1    | WGNA-073118-RW-3785 | 537, 537     | T     | 100 uL          | 100 uL         | Chlorine, ND    |  |  |  |

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

## LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

Batch Number: 237969 Batch Start Date: 08/04/18 08:23 Batch Analyst: Kouchari, ShamiranBatch Method: 537 Batch End Date: 08/06/18 16:10

| Lab Sample ID        | Client Sample ID         | Method Chain | Basis | LC537-MSP 00033 | LC537-SU 00074 | AnalysisComment                                      |  |  |  |
|----------------------|--------------------------|--------------|-------|-----------------|----------------|------------------------------------------------------|--|--|--|
| 320-41679-A-1<br>MSD | WGNA-073118-RW-3<br>785  | 537, 537     | T     | 100 uL          | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-2        | WGNA-073118-FRB-<br>3785 | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-3        | NAWC-073118-RW-1<br>54   | 537, 537     | T     |                 | 100 uL         | Chlorine, ND.<br>Yellow color<br>after<br>extraction |  |  |  |
| 320-41679-A-4        | NAWC-073118-FRB-<br>154  | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-5        | NAWC-073118-RW-1<br>85   | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-6        | NAWC-073118-FRB-<br>185  | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-7        | NAWC-073118-RW-1<br>79   | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-8        | NAWC-073118-FRB-<br>179  | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-9        | NAWC-073118-RW-1<br>24   | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-10       | NAWC-073118-FRB-<br>124  | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-11       | WGNA-073118-RW-3<br>103  | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |
| 320-41679-A-12       | WGNA-073118-FRB-<br>3103 | 537, 537     | T     |                 | 100 uL         | Chlorine, ND                                         |  |  |  |

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

## LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41679-1

SDG No.: \_\_\_\_\_

Batch Number: 237969 Batch Start Date: 08/04/18 08:23 Batch Analyst: Kouchari, ShamiranBatch Method: 537 Batch End Date: 08/06/18 16:10

| Batch Notes                          |                                            |
|--------------------------------------|--------------------------------------------|
| Analyst ID - Aliquot Step            | SKD                                        |
| Batch Comment                        | Client labels match TA label, SKD 08/04/18 |
| Analyst ID - Concentration           | SKD                                        |
| Analyst ID - Final Volume Step       | SKD                                        |
| Internal Standard ID#                | 1303558                                    |
| Manifold ID                          | 1, 3                                       |
| Methanol ID                          | 1319281                                    |
| pH Indicator ID                      | 0818                                       |
| Pipette ID                           | R40536G, I46345G                           |
| Analyst ID - IS Reagent Drop         | SKD                                        |
| Analyst ID - IS Reagent Drop Witness | TWL                                        |
| Analyst ID - SU Reagent Drop         | SKD                                        |
| Analyst ID - SU Reagent Drop Witness | VPM                                        |
| Analyst ID - TA Reagent Drop         | SKD                                        |
| Analyst ID - TA Reagent Drop Witness | VPM                                        |
| SPE Cartridge Lot ID                 | 6390138-02                                 |
| Trizma ID                            | SLBR5241V                                  |
| Reagent Water ID                     | 08/02/18                                   |

| Basis | Basis Description |
|-------|-------------------|
| T     | Total/NA          |

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

PFAS Calibration Calculations:

Initial Calibration  
Instrument A8\_N

8/7/2018

PFOA

| Analyte Concentration | Analyte Response | Internal Standard Response | Internal Standard Amount | RRF     | Reported RRF |
|-----------------------|------------------|----------------------------|--------------------------|---------|--------------|
| 1.98                  | 277484           | 1196979                    | 10                       | 1.17081 | 1.1708       |
| 4.4                   | 554036           | 1204534                    | 10                       | 1.04536 | 1.0454       |
| 9.9                   | 1247621          | 1167019                    | 10                       | 1.07987 | 1.0799       |
| 19.8                  | 2347790          | 1063858                    | 10                       | 1.11458 | 1.1146       |
| 29.7                  | 3802739          | 1182103                    | 10                       | 1.08314 | 1.0831       |
| 39.6                  | 5050799          | 1182381                    | 10                       | 1.07872 | 1.0787       |
| Average               |                  |                            |                          | 1.09541 | 1.0954       |
| Standard Deviation    |                  |                            |                          | 0.0430  |              |
| RSD                   |                  |                            |                          | 0.0392  |              |
| %RSD                  |                  |                            |                          | 3.92191 | 3.9          |

Continuing Calibration  
PFOA

08/08/2018 @ 4:31

| Analyte Concentration | Analyte Response | Internal Standard Response | Internal Standard Amount | RRF    | %D        | Reported RRF | Reported %D |
|-----------------------|------------------|----------------------------|--------------------------|--------|-----------|--------------|-------------|
| 9.9                   | 1169317          | 1104849                    | 10                       | 1.0690 | -2.406385 | 1.069        | -2.4        |

Sample Identification  
Compound

WGNA-073118-RW-3785  
PFOA

|                               |         |                       |        |
|-------------------------------|---------|-----------------------|--------|
| Compound Area                 | 531097  | Average RRF           | 1.0954 |
| Internal Standard Amount (ng) | 10      | Sample Volume(ml)     | 240.3  |
| Dilution Factor               | 1       | Volume Extract (ml)   | 1      |
| Internal Standard Area        | 1291243 | Injection Volume (µl) | 1      |

Concentration  
Reported Result

15.6257 ng/L  
16 ng/L

|             |              |                   |               |                     |
|-------------|--------------|-------------------|---------------|---------------------|
| MA/MSD %R   |              |                   |               | WGNA-073118-RW-3785 |
| PFOA MS %R  | Spike amount | MS concentration  | Sample Result |                     |
| 96.05       | 65.8         | 79.2              | 16            |                     |
| PFOA MSD %R | Spike amount | MSD concentration | Sample Result |                     |
| 94.40       | 67.8         | 80                | 16            |                     |
| MS/MSD RPD  |              |                   |               |                     |
|             |              |                   |               | -1.01               |

Surrogate PFHxA

|                               |         |                       |    |
|-------------------------------|---------|-----------------------|----|
| Compound Area                 | 1250801 |                       |    |
| Internal Standard Amount (ng) | 10      |                       |    |
| Dilution Factor               | 1       | Volume Extract (ml)   | 1  |
| Internal Standard Area        | 1291243 | Injection Volume (µl) | 1  |
| Average RRF                   | 1.0996  |                       |    |
| Concentration                 | 8.8094  |                       |    |
| Surrogate %R                  | 88.09   | Spike amount          | 10 |

|        |                |                   |  |
|--------|----------------|-------------------|--|
| LCS %R | 320-237969/2-A |                   |  |
| PFOA   | Spike amount   | LCS concentration |  |
| 103.48 | 66             | 68.3              |  |

| DODCMD_ID    | INSTALLATION_ID  | SDG         | SITE_NAME  | NORM_SITE_NAME | LOCATION_NAME | LOCATION_TYPE_DESC | COORD_X     | COORD_Y     | CONTRACT_ID   | DO_CTO_NUMBER | CONTR_NAME       | SAMPLE_NAME           | SAMPLE_MATRIX_DESC   | SAMPLE_TYPE_DESC    | COLLECT_DATE | ANALYTICAL_METHOD | ANALYTICAL_METHOD_GRP_DESC |
|--------------|------------------|-------------|------------|----------------|---------------|--------------------|-------------|-------------|---------------|---------------|------------------|-----------------------|----------------------|---------------------|--------------|-------------------|----------------------------|
| MID_ATLANTIC | WILLOW_GROVE_NAS | 320-41846-1 | OFFSITE_RW | SITE 00005     | WGNA-RW-4024  | Domestic well      | 2702640.265 | 321549.5809 | N6247016D9008 | WE04          | TETRA TECH, INC. | WGNA-080618-RW-4024-D | Ground water         | Field duplicate     | 6-Aug-18     | 537               | Perfluoroalkyl Compounds   |
| MID_ATLANTIC | WILLOW_GROVE_NAS | 320-41846-1 |            |                |               |                    |             |             | N6247016D9008 | WE04          | TETRA TECH, INC. | WGNA-080618-FRB-0386  | Water for QC samples | Field Reagent Blank | 6-Aug-18     | 537               | Perfluoroalkyl Compounds   |
| MID_ATLANTIC | WILLOW_GROVE_NAS | 320-41846-1 | OFFSITE_RW | SITE 00005     | WGNA-RW-4024  | Domestic well      | 2702640.265 | 321549.5809 | N6247016D9008 | WE04          | TETRA TECH, INC. | WGNA-080618-RW-4024   | Ground water         | Normal (Regular)    | 6-Aug-18     | 537               | Perfluoroalkyl Compounds   |
| MID_ATLANTIC | WILLOW_GROVE_NAS | 320-41846-1 |            |                |               |                    |             |             | N6247016D9008 | WE04          | TETRA TECH, INC. | WGNA-080618-FRB-0533  | Water for QC samples | Field Reagent Blank | 6-Aug-18     | 537               | Perfluoroalkyl Compounds   |
| MID_ATLANTIC | WILLOW_GROVE_NAS | 320-41846-1 |            |                |               |                    |             |             | N6247016D9008 | WE04          | TETRA TECH, INC. | WGNA-080618-FRB-0413  | Water for QC samples | Field Reagent Blank | 6-Aug-18     | 537               | Perfluoroalkyl Compounds   |
| MID_ATLANTIC | WILLOW_GROVE_NAS | 320-41846-1 | OFFSITE_RW | SITE 00005     | WGNA-RW-0386  | Domestic well      | 2687292.16  | 330732.2721 | N6247016D9008 | WE04          | TETRA TECH, INC. | WGNA-080618-RW-0386   | Ground water         | Normal (Regular)    | 6-Aug-18     | 537               | Perfluoroalkyl Compounds   |
| MID_ATLANTIC | WILLOW_GROVE_NAS | 320-41846-1 | OFFSITE_RW | SITE 00005     | WGNA-RW-0533  | Domestic well      | 2697584.858 | 320233.0473 | N6247016D9008 | WE04          | TETRA TECH, INC. | WGNA-080618-RW-0533   | Ground water         | Normal (Regular)    | 6-Aug-18     | 537               | Perfluoroalkyl Compounds   |
| MID_ATLANTIC | WILLOW_GROVE_NAS | 320-41846-1 | OFFSITE_RW | SITE 00005     | WGNA-RW-0413  | Domestic well      | 2698499.632 | 319585.5155 | N6247016D9008 | WE04          | TETRA TECH, INC. | WGNA-080618-RW-0413   | Ground water         | Normal (Regular)    | 6-Aug-18     | 537               | Perfluoroalkyl Compounds   |
| MID_ATLANTIC | WILLOW_GROVE_NAS | 320-41846-1 |            |                |               |                    |             |             | N6247016D9008 | WE04          | TETRA TECH, INC. | WGNA-080618-FRB-4024  | Water for QC samples | Field Reagent Blank | 6-Aug-18     | 537               | Perfluoroalkyl Compounds   |